



Department of Energy
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November 5, 2002



NOV 20 2002

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Hazardous Waste Bureau
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Subject: Request for Electronic copy of the WIPP Biennial Environmental Compliance Report

Dear Mr. Zappe:

Enclosed is the electronic copy of the WIPP Biennial Environmental Compliance Report (BECR) that you requested.

If you need additional information for your review of the BECR, please contact me at (505) 234-7349.

Sincerely,

Harold Johnson
NEPA Compliance Officer

Enclosure

Electronic file - CD on file



Waste Isolation Pilot Plant Biennial Environmental Compliance Report

2002



United States Department of Energy
Carlsbad Field Office
Carlsbad, New Mexico

Waste Isolation Pilot Plant
Biennial Environmental
Compliance Report
2002

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	xv
1.0 INTRODUCTION	1
1.1 Background of the Waste Isolation Pilot Plant	3
1.2 Biennial Environmental Compliance Report Under the WIPP Land Withdrawal Act	4
1.3 Regulatory Requirements Hierarchy	4
1.3.1 Federal/State Laws	5
1.3.2 Implementing Regulations	5
1.3.3 Permit Conditions	6
1.4 Regulatory Compliance at WIPP	6
1.4.1 Compliance Assurance	6
1.5 Organization of and Reporting Period for the Report	7
1.5.1 Organization of the Report	7
1.5.2 Reporting Period	8
2.0 RESOURCE CONSERVATION AND RECOVERY ACT AND SOLID WASTE DISPOSAL ACT	8
2.1 Summary of the Law	8
2.2 Status of Compliance With the Regulatory Requirements	10
2.2.1 Compliance With the Resource Conservation and Recovery Act	10
2.2.2 Compliance With the Land Disposal Restrictions, 40 CFR Part 268	10
3.0 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT	11
3.1 Summary of the Law	11
3.2 Compliance Status of the Regulatory Requirements	12
3.2.1 Designation of Hazardous Substances, 40 CFR §302.4	12
3.2.2 Determination of Reportable Quantities, 40 CFR §302.5	12
3.2.3 Notification Requirements, 40 CFR §302.6(a)	12
3.2.4 Releases of Mixtures or Solutions, 40 CFR §302.6(b)(1)(i) and (ii)	13
3.2.5 Notification of Releases of Radionuclides, 40 CFR §302.6(b)(2)	13
3.2.6 Notification of the Release of Heavy Metals, 40 CFR §302.6(d)	13
4.0 EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT	14
4.1 Summary of the Law	14
4.2 Compliance Status of the Regulatory Requirements	15
4.2.1 Emergency Planning, 40 CFR §355.30(a)	15
4.2.2 Emergency Planning Notification, 40 CFR §355.30(b)	15
4.2.3 Facility Emergency Coordinator, 40 CFR §355.30(c)	15
4.2.4 Provision of Information, 40 CFR §355.30(d)	15
4.2.5 Emergency Release Notification, 40 CFR §355.40	16

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

4.2.6	Material Safety Data Sheet Reporting, 40 CFR §370.21	16
4.2.7	Inventory Reporting, 40 CFR §370.25	16
4.2.8	Reporting Requirements and Schedule for Reporting, 40 CFR §372.30	17
5.0	ATOMIC ENERGY ACT AND THE ENVIRONMENTAL PROTECTION AGENCY	17
5.1	Summary of the Law	17
5.2	Compliance Status With the Regulatory Requirements	18
5.2.1	Radiation Protection Standards, 40 CFR Part 191	18
5.2.2	WIPP Compliance Certification Criteria, 40 CFR Part 194 . . .	20
6.0	CLEAN AIR ACT	20
6.1	Summary of the Law	20
6.1.1	Title I, <i>Air Pollution Prevention and Control</i>	20
6.1.2	Title II, <i>Emission Standards for Mobile Sources</i>	22
6.1.3	Title III, <i>General Provisions</i>	23
6.1.4	Title IV, <i>Acid Deposition Control</i>	23
6.1.5	Title V, <i>Permits</i>	23
6.1.6	Title VI, <i>Stratospheric Ozone Protection</i>	23
6.2	Compliance Status With the Regulatory Requirements	24
6.2.1	Control of Pollution from Federal Facilities, CAA §118	24
6.2.2	National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities, 40 CFR Part 61, Subpart H	25
6.2.3	State Operating Permit Programs, 20.2.70 NMAC and 20.2.71 NMAC	28
6.2.4	Protection of Stratospheric Ozone, 40 CFR Part 82	29
6.3	Compliance Status of Permit Conditions	32
7.0	FEDERAL WATER POLLUTION CONTROL ACT OF 1972 ("CLEAN WATER ACT")	32
7.1	Summary of the Law	32
7.2	Compliance Status of the Regulatory Requirements	32
7.2.1	SPCC Plan Requirements, 40 CFR §112.3	32
7.2.2	Amendment of the SPCC Plan by the Owner/Operator, 40CFR §112.5	33
7.2.3	Notification of Discharge of a Reportable Quantity, 40 CFR §117.21	33
7.2.4	NPDES Permit Requirement, 40 CFR §122.1(b)(1)	33
7.2.5	NPDES Permit Assessment, 40 CFR §122.21(c)(2)	33
7.2.6	Requirement for NPDES Permit for Storm Water Discharges, 40 CFR §122.26(a)	34
7.3	Compliance Status of Permit Conditions	34
7.3.1	Notice of Termination, IV(A)(4)	34
7.3.2	Prohibition on Non-Storm Water Discharges, IV(B)(1) and Appendix B, III(A)	34

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

7.3.3	Releases of Reportable Quantities of Hazardous Substances and Oil, IV(B)(2) and Appendix B, III(B)	35
8.0	SAFE DRINKING WATER ACT	35
8.1	Summary of the Law	35
8.2	Compliance Status of the Regulatory Requirements	35
8.2.1	State Program Requirements, 40 CFR §142.3(b)	35
8.2.2	Underground Injection Control, 40 CFR Part 144	36
9.0	TOXIC SUBSTANCES CONTROL ACT	36
9.1	Summary of the Law	36
9.1.1	Asbestos Hazard Emergency Response Act of 1986	36
9.1.2	Indoor Radon Abatement	36
9.1.3	Polychlorinated Biphenyls	37
9.2	Compliance Status of the Regulatory Requirements	38
9.2.1	Study of Radon in Federal Buildings, TSCA, §309	38
9.2.2	Prohibition of PCBs, 40 CFR §761.20	38
9.2.3	Disposal Requirements for PCBs, 40 CFR §761.60	38
10.0	FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT	39
10.1	Summary of the Law	39
10.2	Compliance Status of the Regulatory Requirements	39
10.2.1	Registration of Pesticide Products, 40 CFR §152.15	39
10.2.2	Storage and Disposal of Pesticides and Containers, 40 CFR §156.10	40
11.0	NOISE CONTROL ACT OF 1972	40
11.1	Summary of the Law	40
11.2	Compliance Status of the Regulatory Requirement	41
11.2.1	Compliance With Hearing Protection Standards, 29 CFR §1910.95	41
12.0	NATIONAL ENVIRONMENTAL POLICY ACT	41
12.1	Summary of the Law	41
12.2	Compliance Status of the Regulatory Requirements	42
12.2.1	Provision of Environmental Information to Public Officials and Private Citizens, 40 CFR Parts 1500 Through 1508	42
12.3	U.S. Department of Energy Compliance With NEPA	42
12.3.1	Summary of the Regulations	42
12.3.2	Implementing DOE's NEPA Regulations at WIPP, 10 CFR Part 1021	43
12.3.3	Status of Other NEPA Documentation Related to WIPP	45
12.3.4	Operational Compliance With NEPA at WIPP	46

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

13.0	ATOMIC ENERGY ACT AND THE U.S. DEPARTMENT OF ENERGY	46
13.1	Summary of the Law	46
13.2	Compliance Status With the Regulatory Requirements	47
13.2.1	DOE Order 151.1A, <i>Comprehensive Emergency Management System</i>	47
13.2.2	DOE Order 225.1A, <i>Accident Investigation</i>	47
13.2.3	DOE Order 231.1, <i>Environment, Safety and Health Reporting</i>	48
13.2.4	DOE Order 232.1A, <i>Occurrence Reporting and Processing of Operations Information</i>	48
13.2.5	DOE Order 414.1A, <i>Quality Assurance</i>	48
13.2.6	DOE Order 420.1A, <i>Facility Safety</i>	48
13.2.7	DOE Order 435.1, <i>Radioactive Waste Management</i>	48
13.2.8	DOE Order 440.1A, <i>Worker Protection Management for DOE Federal Contractor Employees</i>	49
13.2.9	DOE Order 451.1B, <i>National Environmental Policy Act Compliance Program</i>	49
13.2.10	DOE Order 460.1A, <i>Packaging and Transportation Safety</i>	49
13.2.11	DOE Order 460.2, <i>Departmental Materials Transportation and Packaging Management</i>	49
13.2.12	DOE Order 5400.1, <i>General Environmental Protection Program</i>	49
13.2.13	DOE Order 5400.5, <i>Radiation Protection of the Public and the Environment</i>	50
13.2.14	DOE Order 5480.4, <i>Environmental Protection, Safety and Health Protection Standards (portions)</i>	50
13.3	Other Regulations - 10 CFR Part 830 Series	50
13.3.1	Taking Action(s) Inconsistent With the Requirements of 10 CFR Part 830, 10 CFR §830.4(a)	51
13.3.2	Implementation and Compliance With the Requirements of 10 CFR Part 830, 10 CFR §830.4(b)	51
13.3.3	Reasonable Assurance of Adequate Protection of Workers, the Public, and the Environment, 10 CFR §830.4(c)	51
13.3.4	Records to Substantiate Compliance, 10 CFR §830.6	51
13.3.5	Use of a Graded Approach, 10 CFR §830.7	51
13.3.6	Conduct of Work in Accordance With 10 CFR §830.121(a) and 10 CFR §830.122	52
13.3.7	Application of the Appropriate QA Criteria in the QAP and Annual Submittal of Substantive Changes in the QAP to the DOE, 10 CFR §830.121(b) and 10 CFR §830.121(c)	52
13.3.8	QA Criteria to Be Included in the QAP, 10 CFR §830.122	53
13.3.9	Safety Basis, 10 CFR §830.202(a)	54
13.3.10	Unreviewed Safety Question Process, 10 CFR §830.203(a)	54
13.3.11	Documented Safety Analysis, 10 CFR §830.204(a)	54
13.3.12	Technical Safety Requirements, 10 CFR §830.205(a)	55

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

13.3.13	Occupational Dose Limits for General Employees, 10 CFR §835.202(a)	55
13.4	Nuclear Safety Noncompliance and the Price-Anderson Amendments Act of 1988	55
14.0	ATOMIC ENERGY ACT AND THE U.S. NUCLEAR REGULATORY COMMISSION	56
14.1	Summary of the Law	56
14.2	Compliance Status of the Regulatory Requirements	57
14.2.1	General License, 10 CFR §71.12	57
14.2.2	Contents of Application and Package Description/ Evaluation, 10 CFR §§71.31 Through 71.39	57
14.2.3	Demonstration of Compliance, 10 CFR §71.41	57
14.2.4	Standards for All Packages, 10 CFR §§71.43 and 71.45	58
14.2.5	External Radiation Standards for All Packages, 10 CFR §71.47	58
14.2.6	Additional Requirements for Type B Packages, 10 CFR §71.51	58
14.2.7	Requirements for All Fissile Material Packages, 10 CFR §§71.55 Through 71.59	59
14.2.8	Special Requirements for Plutonium Shipments, 10 CFR §71.63	59
14.2.9	Tests Under Normal Conditions of Transport, 10 CFR §71.71	59
14.2.10	Tests Under Hypothetical Accident Conditions, 10 CFR §71.73	60
14.2.11	Assumptions Regarding Unknown Properties, 10 CFR §71.83	60
14.2.12	Special Opening Instructions, 10 CFR §71.89	60
14.2.13	Reports Regarding Decreased Effectiveness or Defects With Safety Significance, 10 CFR §71.95	60
14.2.14	Advance Notification of Shipment of Nuclear Waste, 10 CFR §71.97	61
14.2.15	NRC Quality Assurance Requirements, 10 CFR §§71.101 Through 71.137	62
14.3	Compliance Status of the Certificate of Compliance	62
14.3.1	Allowable Decay Heat, C of C, Page 3, 5(b)(2)	63
15.0	HAZARDOUS MATERIALS TRANSPORTATION ACT	63
15.1	Summary of the Law	63
15.2	Compliance Status of the Regulatory Requirements	65
15.2.1	General Requirements, 49 CFR §171.2	65
15.2.2	Hazardous Waste, 49 CFR §171.3	65
15.2.3	Transitional Provisions for Implementing Certain Requirements, 49 CFR §171.14	65

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

15.2.4	Immediate Notice of Certain Hazardous Materials Incidents and Detailed Hazardous Materials Incident Reports, 49 CFR §§171.15 Through 171.16	66
15.2.5	Table of Hazardous Materials and Special Provisions, 49 CFR §172.101	66
15.2.6	Shipping Papers, Subpart C, 49 CFR §§172.200 Through 172.205	66
15.2.7	Marking, Subpart D, 49 CFR §§172.300 Through 172.338	66
15.2.8	Labeling, Subpart E, 49 CFR §§172.400 Through 172.450	67
15.2.9	Placarding, Subpart F, 49 CFR §§172.500 Through 172.560	67
15.2.10	Emergency Response Information, Subpart G, 49 CFR §172.600	67
15.2.11	Training Subpart H, Federal/State Relationship, and Applicability and Responsibility for Training and Testing, and Training Requirements, 49 CFR §§172.700 Through 172.702 and 172.704	68
15.2.12	General, Subpart A, 49 CFR §§173.1 Through 173.12	68
15.2.13	Preparation of Hazardous Materials for Transportation, Subpart B, 49 CFR §§173.21 Through 173.40	69
15.2.14	Definitions, Classification, and Packaging for Class 1 Materials, Subpart C, 49 CFR §§173.50 Through 173.63	69
15.2.15	Definitions, Classification, Packaging Group Assignments, and Exceptions for Hazardous Materials Other than Class 1 and Class 7, Subpart D, 49 CFR §§173.115 Through 173.156	69
15.2.16	Non-Bulk Packaging Requirements for Hazardous Materials Other than Class 1 and Class 7, Subpart E, 49 CFR §§173.158 Through 173.229	69
15.2.17	Radioactive Materials, Subpart I, 49 CFR §§173.401 Through 173.476	70
15.2.18	Carriage by Aircraft, 49 CFR Part 175	70
15.2.19	General Information and Regulations, Subpart A, 40 CFR §177.800; Driver Training, 49 CFR §177.816; and Routing of Class 7 (Radioactive) Materials, Subpart D, 49 CFR Part 397	71
15.2.20	Specifications for Packagings, 49 CFR Part 178	71
16.0	MATERIALS ACT OF 1947	72
16.1	Summary of the Law	72
16.2	Compliance Status of the Regulatory Requirement	72
17.0	FEDERAL LAND POLICY AND MANAGEMENT ACT	72
17.1	Summary of the Law	72
17.2	Compliance Status of the Regulatory Requirements	73
17.2.1	Resource Management Planning Guidance, 43 CFR §1610.1	74

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

17.2.2	Public Participation, 43 CFR §1610.2	74
17.2.3	Consistency of Management Plans, 43 CFR §1610.3-2	74
17.2.4	Common Terms and Conditions of Right-of-Way Reservations and Temporary-Use Permits, 43 CFR §2801.2(a)	74
17.2.5	Conditions to be Incorporated Within all Right-of-Way Reservations and Temporary-Use Permits, 43 CFR §2801.2(b)	75
17.2.6	Requirements for Applications for Right-of-Way Reservations and Temporary-Use Permits, 43 CFR §2802.2	76
17.3	Compliance Status of the Permit Conditions	77
17.3.1	Common Conditions of the Right-of-Way Reservations	77
17.3.2	Right-of-Way Reservation No. NM 53809, Water Pipeline	78
17.3.3	Right-of-Way Reservation No. NM 55676, North Access Road	79
17.3.4	Right-of-Way Reservation No. NM 55699, Railroad	81
17.3.5	Right-of-Way Reservation for an Aerosol Sampling Site, No. NM 77921 (NM 77860)	83
17.3.6	Caliche Free-Use Permit, No. NM 96943	84
18.0	PUBLIC RANGELANDS IMPROVEMENT ACT	84
18.1	Summary of the Law	84
18.2	Compliance Status of the Regulatory Requirement	85
18.2.1	Land Use Plans, 43 CFR §§4100.0 Through 4100.8	86
19.0	TAYLOR GRAZING ACT	86
19.1	Summary of the Law	86
19.2	Compliance Status of the Regulatory Requirements	87
19.2.1	Land Use Plans, 43 CFR §§4100.0 Through 4100.8	87
19.2.2	Allotment Management Plans, 43 CFR §4120.2	87
20.0	BALD AND GOLDEN EAGLE PROTECTION ACT	88
20.1	Summary of the Law	88
20.2	Compliance Status of the Regulatory Requirements	88
20.2.1	Permit Application Procedures, 50 CFR §13.11	89
20.2.2	General Permit Requirements, 50 CFR §22.11	89
20.2.3	Permits to Take Golden Eagle Nests, 50 CFR §22.25	89
21.0	MIGRATORY BIRD TREATY ACT	89
21.1	Summary of the Law	89
21.2	Compliance Status of the Regulatory Requirements	91
21.2.1	Permit Application Procedures, 50 CFR §13.11	91
21.2.2	Information Requirements for Permit Applications, 50 CFR §13.12	91
21.2.3	Display of Permit, 50 CFR §13.44	91
21.2.4	Filing of Reports, 50 CFR §13.45	91

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

21.2.5	Maintenance of Records, 50 CFR §13.46	91
21.2.6	Inspection Requirement, 50 CFR §13.47	92
21.2.7	Compliance With Permit Conditions, 50 CFR §13.48	92
21.2.8	Acceptance of Liability, 50 CFR §13.50	92
21.2.9	Compliance With Applicable Migratory Bird Hunting Regulations, 50 CFR Part 20, Subpart C	92
21.2.10	Application for Banding or Marking Permit, 50 CFR §21.22(a)	93
21.2.11	Additional Permit Conditions, 50 CFR §21.22(c)	93
21.2.12	Term of Permit, 50 CFR §21.22(d)	93
21.2.13	Special-Purpose Permits, 50 CFR §21.27	94
22.0	ENDANGERED SPECIES ACT	94
22.1	Summary of the Law	94
22.2	Compliance Status of the Regulatory Requirements	95
23.0	NATIONAL HISTORIC PRESERVATION ACT	96
23.1	Summary of the Law	96
23.2	Compliance Status of the Regulatory Requirements	97
23.2.1	Assessment of Effects on Historic Properties, 36 CFR §800.5	97
23.2.2	Development of a Plan for the Treatment of Historical Property Discovered During a Federal Agency Undertaking, 36 CFR §800.11	97
23.2.3	Application for Permits and Information Collection, 43 CFR §7.5	98
24.0	NEW MEXICO ENVIRONMENTAL IMPROVEMENT ACT	98
24.1	Summary of the Law	98
24.2	Compliance Status of the Law	98
25.0	NEW MEXICO HAZARDOUS WASTE ACT	98
25.1	Summary of the Law	98
25.2	Compliance Status of Regulatory Requirements	101
25.2.1	Compliance With Standards Applicable to Generators of Hazardous Waste, 20.4.1.300 NMAC	101
25.2.2	Compliance With Standards Applicable to Transporters of Hazardous Waste, 40 CFR Part 263 (20.4.1.400 NMAC)	110
25.2.3	Compliance With the Regulatory Requirements for TSDFs, 40 CFR Part 264 (20.4.1.500 NMAC)	112
25.2.4	Compliance With the Hazardous/Mixed Waste Permit Program, 40 CFR Part 270 (20.4.1.900 NMAC and 20.4.1.901 NMAC)	132
25.2.5	Compliance With the Universal Waste Management Regulations Under 20.4.1.1000 NMAC (40 CFR Part 273)	134

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

	25.2.6 Compliance With the UST Regulatory Requirements Under 20.5 NMAC	136
26.0	NEW MEXICO SOLID WASTE ACT	153
26.1	Summary of the Law	153
26.2	Compliance Status of the Regulatory Requirements	154
26.2.1	General Requirements, 20.9.1.106 NMAC	154
26.2.2	Prohibited Acts, 20.9.1.107 NMAC	154
26.2.3	Exemptions, 20.9.1.108.C NMAC	155
26.2.4	Record Keeping and Annual Reports, 20.9.1.109 NMAC ...	155
26.2.5	Facilities, Entry by Department, Availability of Records to Department and Others, 20.9.1.111 NMAC	155
26.2.6	Solid Waste Facility Permits, 20.9.1.200 NMAC	156
26.2.7	Registration of Commercial Haulers, 20.9.1.200.N NMAC ..	156
26.2.8	Solid Waste Facility Operation Requirements, 20.9.1.400 NMAC	156
26.2.9	Landfill Closure and Postclosure Requirements, 20.9.1.500 NMAC	156
26.2.10	Operator Certification, 20.9.1.600 NMAC	157
26.2.11	Asbestos Waste, 20.9.1.700.E NMAC	157
26.2.12	Storage and Containment of Infectious Waste, 20.9.1.700.F NMAC	157
26.2.13	Infectious Waste Treatment, Storage, and Disposal Facilities, 29.1.700.F(4) NMAC	158
26.2.14	Treatment and Disposal of Infectious Waste, 20.9.1.700.F(5) NMAC	158
26.2.15	Petroleum Contaminated Soil, 20.9.1.700.H NMAC	158
26.2.16	Manifest Requirements, 20.9.1.712 NMAC	158
27.0	NEW MEXICO GROUND WATER PROTECTION ACT	159
27.1	Summary of the Law	159
27.2	Compliance Status of the Regulatory Requirement	159
27.3	Corrective Action for Spills/Releases from USTs, NMED-92-1	159
28.0	NEW MEXICO AIR QUALITY CONTROL ACT	160
28.1	Summary of the Law	160
28.2	Compliance Status of the Regulatory Requirements	160
28.2.1	Sampling Equipment, 202.1.113 NMAC	160
28.2.2	Excess Emissions During Malfunction, Start-Up, Shutdown, or Scheduled Maintenance, 20.2.7.108 NMAC	160
28.2.3	Controlling Emissions Leaving New Mexico, 20.2.8 NMAC	161
28.2.4	Oil-Burning Equipment--Particulate Matter, 20.2.18 NMAC	161
28.2.5	Oil-Burning Equipment--Nitrogen Dioxide, 20.2.34 NMAC ..	161
28.2.6	Regulations to Control Open Burning, 20.2.60 NMAC	161

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

	28.2.7 Regulations to Control Smoke and Visible Emissions, 20.2.61 NMAC	161
	28.2.8 Compliance Plan, 20.2.70.300 NMAC	162
	28.2.9 Semiannual Operating Permit Reports and Progress Reports on the Compliance Plan, 20.2.70.300 NMAC	162
	28.2.10 Permits, 20.2.72 NMAC	162
	28.2.11 Permit Fees, 20.2.75 NMAC	163
	28.2.12 Stack Height Requirements, 20.2.80 NMAC	163
28.3	Compliance Status of Permit Conditions	163
	28.3.1 Permit for Backup Diesel Generators, Permit No. 310-M-2	163
29.0	NEW MEXICO WATER QUALITY ACT	168
29.1	Summary of the Law	168
29.2	Compliance Status of the Regulatory Requirements	168
	29.2.1 Notice of Intent to Discharge, 20.6.2.1201 NMAC	168
	29.2.2 Filing of Plans and Specifications - Sewerage Systems, 20.6.2.1202 NMAC	169
	29.2.3 Notification of Discharge - Removal, 20.6.2.1203 NMAC	169
	29.2.4 General Requirements, 20.6.2.2101 NMAC	169
	29.2.5 Discharge Permit Required, 20.6.2.3104 NMAC	170
	29.2.6 Application for Discharge Permits and Renewals, 20.6.2.3106 NMAC	170
	29.2.7 Monitoring, Reporting, and Other Requirements, 20.6.2.3107 NMAC	170
	29.2.8 Public Notice and Participation, 20.6.2.3108 NMAC	170
	29.2.9 Director Approval, Disapproval, Modification, or Termination of Proposed Discharge Plans, 20.6.2.3109 NMAC	171
	29.2.10 Water Quality Standards for Interstate and Intrastate Streams in New Mexico, 20.6.4 NMAC	171
	29.2.11 Utility Operator Certification, 20.7.4 NMAC	171
29.3	Compliance Status of the Permit Requirements	171
	29.3.1 Requirements for Reporting Discharge Volumes, Water Sources, and Quarterly Reports, DP-831 Conditions for Approval (CA) 1	172
	29.3.2 Requirement for Water Quality Analysis Submitted With Quarterly Report, DP-831 CA 2	172
	29.3.3 Requirement for Reporting Volume and Origin of Miscellaneous Nonhazardous Discharges, DP-831 CA 3	173
	29.3.4 Authorization to Discharge, DP-831 Specific Requirement 1	173
	29.3.5 Authorization to Discharge, DP-831 Specific Requirement 2	173
	29.3.6 Authorization to Discharge, DP-831 Specific Requirement 3	173
	29.3.7 Maintenance of Berms, DP-831 Specific Requirement 4	174

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

29.3.8	Contingency Plan Required, DP-831 Specific Requirement 5	174
29.3.9	Facility Closure Plan Required, DP-831 Specific Requirement 6	174
29.3.10	General Requirement, <i>Monitoring and Reporting</i> , DP-831	174
29.3.11	General Requirement, <i>Record Keeping</i> , DP-831	174
29.3.12	General Requirement, <i>Inspection and Entry</i> , DP-831	175
29.3.13	General Requirement, <i>Duty to Provide Information</i> , DP-831	175
29.3.14	General Requirement, <i>Spills, Leaks, and Other Unauthorized Discharges</i> , DP-831	175
29.3.15	General Requirement, <i>Retention of Records</i> , DP-831	175
29.3.16	General Requirement, <i>Modifications and/or Amendments</i> , DP-831	176
30.0	NEW MEXICO DRINKING WATER REGULATIONS	176
30.1	Summary of the Regulations	176
30.2	Compliance Status of the Regulatory Requirements	176
30.2.1	Maximum Microbiological Contaminant Level, 20.7.10.200.E NMAC	177
30.2.2	Cross-Connections, 20.7.10.200.H(9) NMAC	177
30.2.3	Sampling Certificates, 20.7.10.300.A(5) NMAC	177
30.2.4	Compliance Sampling, 20.7.10.300.B NMAC	178
30.2.5	Laboratories, 20.7.10.300.I NMAC	178
30.2.6	Sampling of Consecutive Public Water-Supply Systems, 20.7.10.300.J NMAC	178
30.2.7	Reporting Requirements, 20.7.10.400.A NMAC	179
30.2.8	Record Maintenance, 20.7.10.400.C NMAC	179
31.0	NEW MEXICO HAZARDOUS CHEMICALS INFORMATION ACT	180
31.1	Summary of the Law	180
31.2	Compliance Status of the Regulatory Requirements	180
31.2.1	Notice of Extremely Hazardous Substance, §74-4E-5(A)(1)	180
31.2.2	Notice of Release of Chemical Substance(s), §74-4E-5(A)(2)	180
31.2.3	Hazardous Material Inventory, §74-4E-5(A)(3)	181
31.2.4	Toxic Chemical Release Inventory, §74-4E-5(A)(4)	181
32.0	NEW MEXICO EMERGENCY MANAGEMENT ACT	181
32.1	Summary of the Law	181
32.2	Compliance Status of the Regulatory Requirements	182
32.2.1	State Police Emergency Response Officer; Procedure for Notification; Cooperation of Other State Agencies and Local Governments, §74-4B-5	182
32.2.2	Clean-Up, §74-4B-10	182

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

33.0	NEW MEXICO PREHISTORIC AND HISTORIC SITES PRESERVATION ACT	183
33.1	Summary of the Law	183
33.2	Compliance Status of the Regulatory Requirements	183
34.0	NEW MEXICO STATE IMPLEMENTATION OF THE FEDERAL LAND POLICY AND MANAGEMENT ACT	184
34.1	Summary of the Law	184
34.2	Compliance Status of the Regulatory Requirements	184
34.2.1	Survey Plat, 19.2.10.12NMAC	184
34.2.2	Application Form, 19.2.10.13 NMAC	184
34.2.3	Easement of Right-of-Way Dimensions, 19.2.10.16 NMAC	185
34.2.4	Damage Surety, 19.2.10.18 NMAC	185
34.2.5	Construction Reports, 19.2.10.19 NMAC	185
34.2.6	Affidavit of Completion, 19.2.10.20 NMAC	185
34.2.7	Renewal of Easement or Right-of-Way, 19.2.10.24 NMAC	186
34.2.8	Reclamation and Restoration, 19.2.10.27 NMAC	186
34.3	Compliance Status of the Permit Conditions	186
34.3.1	Disposal of Brush and Other Debris, Term/Condition 3	186
34.3.2	Prevention of Destruction or Injury to Improvements or Livestock, Term/Condition 5	187
34.3.3	Purpose of Right-of-Way, Term/Condition 6	187
34.3.4	Existing Rights, Term/Condition 7	187
34.3.5	Leases for Mineral Resources, Term/Condition 8	187
34.3.6	Compliance With all Applicable Regulations and Requirements, Term/Condition 9	187
34.3.7	Non-Use of the Right-of-Way, Term/Condition 10	188
34.3.8	Protection and Preservation of Natural Environmental Conditions, Term/Condition 13	188
34.3.9	Reclamation of All Disturbed Areas, Term/Condition 14	188
35.0	NEW MEXICO STATE IMPLEMENTATION OF THE BALD AND GOLDEN EAGLE PROTECTION ACT	189
35.1	Summary of the Law	189
35.2	Compliance Status of the Regulatory Requirements	189
36.0	NEW MEXICO WILDLIFE CONSERVATION ACT, SUPPLEMENTING THE ENDANGERED SPECIES ACT	189
36.1	Summary of the Law	189
36.2	Compliance Status of the Regulatory Requirements	191
36.2.1	Report of Unpermitted Removal, Capture, or Destruction of Endangered Species, Regulation 19.33.2 NMAC	191
36.2.2	Recognition of State-Listed Endangered Wildlife, Regulation 19.33.6 NMAC	192

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

36.2.3	Permit Application and Requirements to Conduct Activities Authorized Under Regulation 19.36.2 NMAC	192
36.2.4	Year-End Reports, Regulation 19.36.2 NMAC	192
36.3	Compliance Status of the Permit Conditions	192
36.3.1	Permit No. 1894	193
36.3.2	Permit No. 1961	193
37.0	NEW MEXICO PESTICIDE CONTROL ACT	193
37.1	Summary of the Law	193
37.2	Compliance Status of the Regulatory Requirements	194
37.2.1	Storage of Pesticides and Disposal of Pesticide Wastes, Section 5 of Regulatory Order No. 4	194
37.2.2	License Classification, Section 6 of Regulatory Order No. 5	194
37.2.3	Protective Equipment, Section 10 of Regulatory Order No. 5	195
37.2.4	Application of Pesticides, Section 11 of Regulatory Order No. 5	195
38.0	REFERENCES	195
39.0	ADDITIONAL REFERENCES AND DOCUMENTS	197
	Appendix A - Index of Requirements by Technical Subject Areas	203
	Appendix B - Title 40 CFR Part 191, Subpart A, Environmental Standards for Management and Storage	217

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

ACRONYMS AND ABBREVIATIONS

AEA	Atomic Energy Act
AHERA	Asbestos Hazard Emergency Response Act
ALARA	as low as reasonably achievable
BECR	Biennial Environmental Compliance Report
BLM	Bureau of Land Management
BTU	British thermal unit
C of C	Certificate of Compliance
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAO	Carlsbad Area Office (now Carlsbad Field Office)
CAP88	Clean Air Act Assessment Package-1988
CBFO	Carlsbad Field Office
CCA	Compliance Certification Application
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	chlorofluorocarbon
CFR	<i>Code of Federal Regulations</i>
CH	contact-handled
CWA	Clean Water Act
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DP	Discharge Plan
DWR	(New Mexico) Drinking Water Regulations
EA	environmental assessment
EDE	effective dose equivalent
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FAS	fixed air samplers
FEIS	Final Environmental Impact Statement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FR	<i>Federal Register</i>
FWS	(U.S.) Fish and Wildlife Service
GET	General Employee Training
gpd	gallons per day

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

GWPA	Ground Water Protection Act
HAP	hazardous air pollutant
HCIA	Hazardous Chemicals Information Act
HMTA	Hazardous Materials Transportation Act
HSWA	Hazardous and Solid Waste Amendments of 1984
HWA	Hazardous Waste Act
HWDU	Hazardous Waste Disposal Unit
HWFP	(WIPP) Hazardous Waste Facility Permit
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICV	inner containment vessel
INEEL	Idaho National Engineering and Environmental Laboratory
LANL	Los Alamos National Laboratory
LEPC	Local Emergency Planning Committee
LDR	Land Disposal Restriction
LMP	Land Management Plan
LWA	(Waste Isolation Pilot Plant) Land Withdrawal Act
MAP	Mitigation Action Plan
MOC	management and operating contractor
MOU	Memorandum of Understanding
mg/l	milligrams/liter
mrem	millirem
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code
NMDG&F	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NOC	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRC	(U.S.) Nuclear Regulatory Commission
NSPS	New Source Performance Standards
ODS	ozone-depleting substance
PA	public address (system)
PAAA	Price-Anderson Amendments Act of 1988
PCB	polychlorinated biphenyl
pCi/l	picoCuries/liter

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

PEIS	Programmatic Environmental Impact Statement
Pub. L.	Public Law
ppm	parts per million
PSD	Prevention of Significant Deterioration
QA	quality assurance
QAP	Quality Assurance Program
QAPD	Quality Assurance Program Description
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
ROD	Record of Decision
RQ	reportable quantity
RWP	Radiological Work Permit
SAA	Satellite Accumulation Area
SAIC	Science Application International Corporation
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SEIS	Supplemental Environmental Impact Statement
SERC	State Emergency Response Commission
SHPO	State Historic Preservation Officer (or Office)
SIC	Standard Industrial Classification
SLO	State Land Office
SPCC	spill prevention, control, and countermeasure
SWDA	Solid Waste Disposal Act
SWMU	Solid Waste Management Unit
TDS	total dissolved solids
TE	transportation engineer
tpy	tons per year
TRANSCOM	Transportation Tracking and Communications System
TRAMPAC	TRUPACT-II Authorized Methods for Payload Control
TRU	transuranic
TRUPACT-II	Transuranic Package Transporter Model II
TSCA	Toxic Substances Control Act
TSDf	Treatment, Storage, and Disposal Facility
U.S.C.	United States Code
USQ	Unreviewed Safety Question
UST	underground storage tank
USTR	Underground Storage Tank Regulation
VOC	volatile organic compound
WAC	Waste Acceptance Criteria

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

WIPP	Waste Isolation Pilot Plant
WM	waste management
WWIS	WIPP Waste Information System

Waste Isolation Pilot Plant Biennial Environmental Compliance Report

DOE/WIPP 02-2171

1.0 INTRODUCTION

This Biennial Environmental Compliance Report (BECR) documents environmental regulatory compliance at the Waste Isolation Pilot Plant (WIPP), a facility designed for the safe disposal of transuranic (TRU) radioactive waste, for the reporting period of April 1, 2000, to March 31, 2002. As required by the WIPP Land Withdrawal Act (LWA) (Public Law [Pub. L.] 102-579, as amended by Pub. L. 104-201), the BECR documents U.S. Department of Energy (DOE) Carlsbad Field Office's (CBFO) compliance with applicable environmental protection laws and regulations implemented by agencies of the federal government and the state of New Mexico.

In the prior BECR, the CBFO and the management and operating contractor (MOC) committed to discuss resolution of a Letter of Violation that had been issued by the New Mexico Environment Department (NMED) in August 1999, which was during the previous BECR reporting period. This Letter of Violation alleged noncompliance with hazardous waste aisle spacing, labeling, and tank requirements. At the time of publication of the prior BECR, resolution of the Letter of Violation was pending. On July 7, 2000, the NMED issued a letter noting that the aisle spacing and labeling concerns had been adequately addressed and that they were rescinding the violation alleging that the Exhaust Shaft Catch Basin failed to comply with the requirements for a hazardous waste tank.

During the current reporting period, WIPP received a Notice of Violation and a compliance order alleging the violation of the New Mexico Hazardous Waste Regulations and the WIPP Hazardous Waste Facility Permit (HWFP). Additional information regarding the Notice of Violation and the compliance order is provided below.

- On September 24, 2001, the NMED issued a Notice of Violation, alleging that the CBFO and the MOC had put in effect certain WIPP HWFP (NM4890139088-TSDF) modifications that did not meet the requirements for class 1 modifications and that, as a result, the CBFO and the MOC had failed to manage, store and dispose of waste as required by the HWFP. The NMED directed the CBFO and the MOC to comply with a "Schedule of Completion," and informed the CBFO and the MOC that failure to comply therewith could possibly result in the initiation of formal enforcement action. Prior to the NMED's issuance of the Notice of Violation, the CBFO and the MOC had notified the NMED that, in their opinion, the class 1 modifications had been properly implemented. The CBFO and the MOC complied with the NMED's requests set forth in the "Schedule of Completion," and resubmitted the class 1 modifications as class 2 modifications. On January 2, 2002, NMED conducted an inspection to determine that CBFO and the MOC had met the requirements specified in the "Schedule of Completion." A February 7, 2002, letter from the NMED documented the NMED's determination of compliance with the "Schedule of Completion." No formal enforcement actions were initiated by the NMED.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

- On January 7, 2002, the NMED issued a compliance order alleging that the CBFO and the MOC had violated the HWFP, citing findings identified by the WIPP Audit Team during a recertification audit of the TRU waste characterization program at the Los Alamos National Laboratory (LANL). The CBFO and the MOC agreed that LANL had inadvertently used an incorrect statistical factor in performing routine determinations of analytical instrument detection limits related to headspace gas sampling of certain drums of waste disposed of at WIPP. The CBFO and the MOC provided the NMED with sufficient technical justification demonstrating that the headspace gas data for the containers in question had been analyzed in compliance with the HWFP's Waste Analysis Plan (WAP). On February 14, 2002, the NMED, the CBFO, and the MOC executed a Settlement Agreement resolving the compliance order. The CBFO and the MOC agreed to a payment of \$25,000 to settle the matter.

- In addition, pursuant to Condition I.E.14, Other Noncompliance, of the HWFP, the CBFO and the MOC are required to report instances of "other noncompliance," not otherwise required to be reported under other provisions of the HWFP. Condition I.E.14 requires that this information be reported to the Secretary of the NMED with the submittal of monitoring reports. During the period since the previous report, two cases of noncompliance were identified for reporting under Condition I.E.14, as detailed below:
 - The first case involved Radiological Work Permits (RWPs), which govern the activities within a controlled area involving TRU mixed waste. During waste handling operations efforts to consolidate RWPs, the underground waste emplacement RWP was inadvertently closed out on June 19, 2001, prior to being included in the surface waste processing RWP. As a result of this inadvertent RWP closure, multiple entries into a radiological area by MOC personnel occurred during waste handling activities in the WIPP underground during the period June 19, 2001, through August 6, 2001. During a review of the RWP on August 6, 2001, this oversight was detected and changes to the waste handling RWP to include underground operations was completed and approved on August 7, 2001. This was a minor paperwork oversight that did not result in any loss of security or unsafe work conditions, as all other safety and radiological requirements were observed.

 - The second case involved the storage of waste at the TRUDOCK on a facility pallet. Waste handling technicians inadvertently failed to comply with the permit prohibition related to storage of wastes on facility pallets at the TRUDOCKs. Between April and July 2001, waste at the TRUDOCKs was stored on a facility pallet overnight on several occasions. On July 16, MOC personnel discovered and halted this practice. The waste handling procedure was changed to clarify that storage was not permitted on pallets at the TRUDOCK. No release or

Waste Isolation Pilot Plant Biennial Environmental Compliance Report

DOE/WIPP 02-2171

threat to human health or the environment occurred as a result of these incidents.

1.1 Background of the Waste Isolation Pilot Plant

The WIPP Project was authorized by the DOE National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (Pub. L. 96-164). This legislation mandated that the CBFO provide a research and development facility to demonstrate the safe disposal of radioactive waste resulting from U.S. defense activities and programs. TRU waste is radioactive waste that contains alpha-emitting radionuclides of atomic number greater than 92, with half-lives longer than 20 years, and which are present in concentrations greater than 100 nanocuries per gram of waste.

In January 1981, the CBFO announced its decision to proceed with a phased development of WIPP, located in Eddy County in southeastern New Mexico, 26 miles east of the city of Carlsbad. The decision called for WIPP to be built to accommodate 6.2 million cubic feet of contact-handled (CH) TRU waste and 0.25 million cubic feet of remote-handled (RH) TRU waste. In 1992, the WIPP LWA limited the total WIPP capacity to 6.2 million cubic feet of TRU waste.

After completing a site and preliminary design validation phase, the construction phase at WIPP began in 1983. At present, surface and underground facilities to support waste handling and disposal operations have been constructed. The largest surface structure is the Waste Handling Building, which includes areas for the receipt, inventory, inspection, and transfer of waste to the underground. The WIPP underground facility, which is 2,150 feet below the land surface in a 2,000-foot-thick bedded salt formation, consists of four shafts, the waste disposal area, an equipment and maintenance facility, and connecting tunnels. Panel 1, consisting of seven waste disposal rooms, is being used for disposal of TRU and TRU mixed waste. Mining in Panel 2, also consisting of seven rooms, was completed in August 2000. Acceptance of the completion of mining was received in September 2000 from the NMED. Because of the natural phenomenon of salt creep, which causes room closure, additional rooms will be mined on an as-needed basis. No waste was placed in Panel 2 during this reporting period.

Originally, the construction phase was to be followed by the pilot plant phase. Following the preparation of the *Final Supplement Environmental Impact Statement* (SEIS, DOE 1990a) in 1990, the CBFO decided that the construction phase was to be followed by a test phase, during which tests with TRU waste were to be conducted underground at WIPP. On October 21, 1993, the CBFO announced its decision not to conduct TRU waste tests underground at the WIPP facility, but rather to conduct enhanced laboratory tests at the LANL.

The *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* ([SEIS-II) (DOE, 1997b) was issued in September 1997. The SEIS-II analyzed the environmental impacts of disposal phase operations of WIPP in light of

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

additional information and changed circumstances since 1990, and also assessed alternatives for disposing of TRU waste at WIPP.

The Record of Decision (ROD) for the SEIS-II was issued January 23, 1998 (DOE, 1998). The selected alternative from the SEIS-II analysis was the disposal of defense-related TRU waste meeting the requirements in the WIPP Waste Acceptance Criteria (WAC), and to transport waste to WIPP by truck with the option of using rail in the future.

The receipt and disposal of the first TRU waste shipment in March 1999 initiated the disposal phase. The disposal phase will be followed by closure as a hazardous waste disposal site that includes the decontamination and decommissioning phase for all support structures.

More detailed information on the background of the WIPP Project can be found in the CBFO's *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (FEIS) (DOE, 1980); the CBFO's 1981 ROD to the FEIS (DOE, 1981); the 1990 SEIS; the 1990 ROD to the SEIS (DOE, 1990b), the SEIS-II (DOE, 1997); and the 1998 ROD to the SEIS-II (DOE, 1998).

1.2 Biennial Environmental Compliance Report Under the WIPP Land Withdrawal Act

This BECR provides the documentation required by the 1992 LWA. The LWA specifies that:

The Secretary shall, not later than two years after the date of the enactment of this Act, and biennially thereafter, submit documentation of continued compliance with the laws, regulations and permit requirements described in paragraph (1) to the Administrator, and, with the law described in paragraph (1)(C), to the state [§9(a)(2)].

Paragraph (1) requires that WIPP comply with Subpart A of Title 40 *Code of Federal Regulations* (CFR) Part 191; the Clean Air Act; the Solid Waste Disposal Act (SWDA); the Safe Drinking Water Act (SDWA); the Toxic Substances Control Act (TSCA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); "all other applicable federal laws pertaining to public health and safety or the environment"; and "all regulations promulgated, and all permit requirements" under these laws.

1.3 Regulatory Requirements Hierarchy

The first step in documenting regulatory compliance is the identification of applicable regulatory requirements. This section describes the interrelationships among laws, regulations, and permit conditions and identifies the origins of the detailed regulatory requirements discussed in this report.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report

DOE/WIPP 02-2171

1.3.1 Federal/State Laws

Laws result from legislative processes at either the federal, state, or local level. This report will:

- Summarize the purpose of each relevant law
- Discuss its applicability to WIPP
- Document compliance by the CBFO at WIPP

1.3.2 Implementing Regulations

Once a law is enacted, it is implemented by an agency that develops appropriate implementing regulations. At the federal level, these regulations are first published in the *Federal Register* (FR in citations) as "proposed rules" for comment from interested groups and individuals. The implementing agency then responds to the comments and prepares the "final rules." The final regulations are also published in the *Federal Register*. They are then codified in the CFR.

New Mexico agencies use a similar process of promulgating regulations by publishing proposed and final rules in the *New Mexico Register* and codifying them in the *New Mexico Administrative Code* (NMAC). Many of the state's environmental laws are based on similar federal statutes. New Mexico has been authorized by federal agencies to administer and enforce some of its own regulatory programs in lieu of the federal programs, providing the state regulations are at least as stringent as the federal requirements.

Local laws or ordinances that apply to WIPP are limited to those under the authority of the Eddy County Commission, Eddy County, New Mexico. Zoning ordinances are the only local laws or ordinances applicable to WIPP. As these do not affect the facility's ability to protect human health and the environment, they are not included in this report.

This report identifies specific requirements of federal and state implementing regulations that apply to the WIPP facility. In some cases where implementing regulations have not been promulgated or where a particular statutory requirement is not covered by the implementing regulations, this report identifies specific requirements directly from the statute.

The WIPP LWA is not considered to be environmental legislation, although many aspects of the LWA impact regulations and laws "pertaining to public health and safety or the environment." Consequently, and at the suggestion of the state of New Mexico, a section has been added to the BECR addressing compliance with the LWA.

The WIPP LWA states that emplacement of TRU waste underground for disposal at WIPP may commence upon the completion of several requirements. The last of these is "the 30-day period beginning on the date on which the Secretary of Energy notifies Congress that the requirements of Section 9(a)(1) have been met [Section 7(b)(3)]."

Waste Isolation Pilot Plant Biennial Environmental Compliance Report

DOE/WIPP 02-2171

Congress was first notified that the requirements were met in May 1998. Disposal operations at WIPP then commenced on March 26, 1999.

1.3.3 Permit Conditions

A number of federal and state implementing regulations include the issuance of permits. Permits allow the regulatory agency to set conditions that must be met by the operators of a facility to meet the statutory goals and to provide timely reporting to the regulatory agency. This report identifies site-specific permit conditions that apply to WIPP.

1.4 Regulatory Compliance at WIPP

The CBFO and its MOC are fully committed to conducting operations at WIPP in a way that achieves and demonstrates compliance with applicable regulations and permit conditions and which protects public health and the environment. Both organizations aggressively pursue compliance with the regulations and continuously assess their achievement of this compliance.

The primary means for maintaining compliance with environmental regulations are through the employment of knowledgeable, trained individuals, through management accountability, and through ongoing self-assessment. Throughout this document it is noted that procedures and manuals are in place to guide and direct WIPP personnel in the performance of specific jobs which have or could have a direct impact on the compliance status in given operational situations. These procedures and manuals are intended to supplement personnel training, education, and qualifications and to promote the operation of the WIPP facility in a safe and environmentally sound manner. Therefore these documents are continually evaluated and revised to assure they are current with respect to both regulatory and operational changes. For this reason, specific procedures and manuals are not referenced in the body of this document. In addition, a number of reports (especially those reports which are a result of regulatory requirements) are referenced throughout the document. Due to the continual update and revision requirements for reports of this nature, they are referenced only by the report title or by the citation that requires their submittal, rather than by document numbers.

1.4.1 Compliance Assurance

Compliance includes a wide range of activities, ranging from the preparation of plans, procedures, reports, or permit applications to hands-on actions such as record keeping, monitoring, sampling and analysis, performing assessments or audits, and housekeeping.

There are three programs to assess WIPP programs and activities which have an impact on WIPP's environmental compliance status. These are the Environmental Compliance Assessment Program, the quality assurance programs (QAPs), and programs established under the CBFO Quality Assurance Program Description (QAPD).

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

The Environmental Compliance Assessment Program provides a comprehensive system to appraise compliance with applicable environmental laws and regulations, and identifies environmentally sound corrective action measures for any identified findings or observations. The assessments are used to identify and eliminate deficiencies that could lead to the following unacceptable events:

- Permit violations
- Regulatory noncompliance
- Safety and health risks to WIPP site workers and/or the general public
- Spills, releases, or discharges of environmental pollutants

Complementing the Environmental Compliance Assessment Program are the CBFO and MOC QA programs. Quality assurance program surveillances, audits, and assessments of activities at WIPP are designed to verify compliance with procedural requirements and determine the adequacy and effectiveness of those activities. Elements of these oversight activities include:

- Monitoring work in progress
- Documenting compliance or noncompliance with established requirements and procedures
- Identifying actual and potential conditions adverse to quality
- Obtaining timely corrective action commitments from cognizant managers
- Providing notification to responsible managers of the status and performance of work under assessment
- Verifying timely implementation of corrective actions

1.5 Organization of and Reporting Period for the Report

The organization of and reporting period for the BECR are discussed in the following subsections.

1.5.1 Organization of the Report

This report organizes the pertinent regulatory requirements into 36 chapters, each corresponding to a federal or state regulatory program. Each law that is relevant to the WIPP facility is addressed separately. Federal regulations are addressed first, followed by New Mexico state regulations. The chapters pertaining to a specific agency are grouped together in the report. For example laws administered by the U.S. Environmental Protection Agency (EPA) are grouped together as Chapters 2.0 through 11.0 and laws administered by the state of New Mexico are grouped as Chapters 24.0 through 37.0.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report

DOE/WIPP 02-2171

Each of the following chapters summarizes a law and its implementing regulations and briefly describes its applicability to WIPP. The requirements of the law and the CBFO's compliance with the requirements are summarized in the text.

The WIPP facility is subject to oversight by a number of regulatory agencies. The scope of the BECR chapters includes the documentation of occasions in which WIPP received a Letter of Violation by a regulatory agency.

Appendix A indexes the specific requirements in terms of their technical subject areas (for example, waste management requirements, water quality requirements, historic preservation requirements, etc.). Appendix B is a report of dose monitoring results required by 40 CFR Part 191, Subpart A.

1.5.2 Reporting Period

This is the fifth BECR to be issued as a result of the WIPP LWA. This BECR addresses the CBFO's compliance status for the reporting period of April 1, 2000, through March 31, 2002, with the exception of the WIPP Confirmatory Measurement Compliance Reports contained in Appendix B. WIPP's compliance reporting for the annual radiation doses must be calculated separately for each calendar year as required by 40 CFR Part 191, Subpart A. Appendix B contains the CY 2000 and CY 2001 WIPP Confirmatory Measurement Compliance Reports.

2.0 RESOURCE CONSERVATION AND RECOVERY ACT AND SOLID WASTE DISPOSAL ACT

2.1 Summary of the Law

The Resource Conservation and Recovery Act (RCRA) (42 United States Code [U.S.C.] §§6901 et seq.), enacted in 1976, is a statute designed to provide "cradle-to-grave" control of hazardous waste by imposing management requirements on generators and transporters of hazardous wastes and on the owners and operators of treatment, storage, and disposal facilities (TSDFs).

In 1965, Congress enacted the SWDA (42 U.S.C. §§3251 et seq.), RCRA's predecessor statute. This act dealt with solid waste disposal and gave the states the responsibility for developing solid waste management plans. In 1970, Congress passed the Resource Recovery Act (Pub. L. 91-12) to provide the EPA with funding for resource recovery programs. The RCRA (Pub. L. 94-550) amended the SWDA and incorporated the intent of the Resource Recovery Act. A number of minor amendments were added during the next few years. The Hazardous and Solid Waste Amendments of 1984 (HSWA) (Pub. L. 98-616) reauthorized RCRA, expanded its scope significantly, and altered many of its provisions. The Medical Waste Tracking Act of 1988 (Pub. L. 100-582) added medical waste tracking provisions to RCRA in Subtitle J. The Federal Facilities Compliance Act of 1992 (Pub. L. 102-386) amended the RCRA subjecting federal agencies to all substantive and procedural requirements of federal,

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

state, and local solid and hazardous waste laws. The term "RCRA" will be used throughout this document to refer to the reauthorized law as amended.

There are two major objectives of the RCRA. The first is to promote the protection of human health and the environment and to conserve material and energy resources. This objective is to be accomplished through such means as ensuring that hazardous waste management practices are conducted so as to protect human health and the environment, minimize the generation of hazardous waste, prohibit open dumping on the land, and require existing open dumps to be converted to facilities that pose no danger to the environment or human health. The second RCRA objective is to set national policy to reduce or eliminate the generation of hazardous waste as expeditiously as possible and to ensure that any hazardous waste generated be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment.

The EPA implements RCRA primarily through 40 CFR Parts 260 through 282: 40 CFR Parts 260 through 279 consist of requirements and standards pertaining to hazardous waste underground storage tanks (USTs); and 40 CFR Parts 280 through 282 pertain to the management of USTs containing petroleum products or hazardous chemicals.

Congress intended for the RCRA program to be implemented by the states. Consequently, the EPA has defined a process through which states may apply for and receive authorization to administer the RCRA program. New Mexico received authorization for the base RCRA program in January 1985 and for its mixed waste program in July 1990. The EPA granted authorization for the corrective action component of the HSWA program to the state of New Mexico in a notice that appeared in the *Federal Register* on October 17, 1995 (effective date: January 2, 1996). The New Mexico Hazardous Waste Act (HWA) is the state statute that governs hazardous waste management activities in New Mexico. New Mexico implements its hazardous waste program through Chapter 4 of Title 20 of the New Mexico Administrative Code (20.4.1 NMAC through 20.4.3 NMAC). By virtue of this authorization, New Mexico has primary responsibility for permitting, implementation, and enforcement for most aspects of the RCRA program. The CBFO has received a hazardous waste facility permit from the NMED. The federal RCRA requirements are presented in this chapter; the state RCRA-related requirements are incorporated in Chapter 25.0, New Mexico Hazardous Waste Act.

Subpart IX of the RCRA governs the management of USTs. This portion of the RCRA and the regulations specified under 40 CFR Parts 280 and 281 (20.5 NMAC) address USTs containing petroleum products or hazardous chemicals. Requirements for UST management pertain to the design, construction, installation, and operation of USTs as well as notification and corrective action requirements in the event of a release and actions required for out-of-service USTs.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The NMED has been authorized by the EPA to regulate USTs. The state UST requirements and the compliance status for each requirement are presented in Chapter 25.0 herein.

2.2 Status of Compliance With the Regulatory Requirements

This chapter provides information on RCRA requirements and the EPA's regulations implementing this act.

2.2.1 Compliance With the Resource Conservation and Recovery Act

Most of the requirements specified in RCRA are covered in more detail in the implementing regulations. The exception is §3016 of the act, which requires each federal agency to provide a biennial inventory of its TSDF.

2.2.1.1 Inventory of Federal Hazardous Waste Facilities, §3016

Each federal agency shall compile, publish, and submit to the EPA Administrator (and the state, if its hazardous waste program has been authorized by the EPA) an inventory of each site which the agency owns or operates at which hazardous waste is stored, treated, or disposed of at any time. The inventory shall be submitted every two years beginning January 31, 1986.

Science Application International Corporation (SAIC) compiles the hazardous waste inventory report for the DOE complex. SAIC submits this report to the EPA in even-numbered years as required by RCRA §3016. The information was provided to the SAIC by letter dated November 27, 2001. The CBFO files the hazardous waste inventory report for WIPP with the NMED as required by RCRA §3016.

2.2.2 Compliance With the Land Disposal Restrictions, 40 CFR Part 268

The LWA, as amended, exempted waste designated by the Secretary of Energy for disposal at WIPP from the treatment standards of the SWDA (42 U.S.C. §6924[m]). By virtue of this exclusion, the CBFO is not required to demonstrate compliance with the Land Disposal Restrictions (LDRs) of 40 CFR Part 268 for waste shipped to WIPP for storage and disposal.

Notification of LDRs for site-generated wastes is made to the off-site permitted TSDF receiving the waste in accordance with 40 CFR Part 268.

**3.0 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION,
AND LIABILITY ACT**

3.1 Summary of the Law

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. §§9601 et seq.), or "Superfund," and the Superfund Amendments and Reauthorization Act of 1986 (SARA) establish a comprehensive federal strategy for responding to, and establishing liability for, releases of hazardous substances from a facility to the environment. Because WIPP is not a CERCLA remediation site and is not expected to become one, most of the requirements of this act do not apply. The Emergency Planning and Community Right-to-Know Act was enacted as a stand-alone portion under SARA, Title III. It is described in further detail in Chapter 4.0, Emergency Planning and Community Right-to-Know Act.

Any spills of reportable quantities (RQs) of hazardous substances must be reported to the National Response Center under the provisions of §103 of CERCLA, "Notification Requirements Respecting Released Substances," and the implementing regulations in 40 CFR Part 302, "Designation, Reportable Quantities, and Notification." The MOC is responsible for reporting and managing any release of hazardous substances at WIPP as defined in §101 of CERCLA, "Definitions," in quantities equal to or greater than the RQs outlined in §102, "Designation of Additional Hazardous Substances and Establishment of Reportable Released Quantities; Regulations," and specified in 40 CFR Part 302. In the event of a release of a hazardous substance to the environment in an amount that meets or exceeds the RQ for that substance, a notification of the release will be made to the National Response Center and other appropriate agencies by MOC personnel as required by §103 of CERCLA. Section 120(c) of CERCLA, "Federal Agency Hazardous Waste Compliance Docket," establishes a docket that provides information regarding federal facilities that manage hazardous waste or from which hazardous substances may be or have been released. This information is to be submitted to the EPA by federal agencies under §103 of CERCLA or under §§3005, 3010, or 3016 of the RCRA. Facilities listed under the docket must prepare a Preliminary Assessment and submit it to the EPA in accordance with CERCLA (42 U.S.C. §9620).

Under 40 CFR Part 300, "National Oil and Hazardous Substances Pollution Contingency Plan," the organizational structures and procedures are provided for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants. The National Oil and Hazardous Substances Pollution Contingency Plan is required by Part 105 of the CERCLA, as well as §311(d) of the Clean Water Act (33 U.S.C. 1321(d), as amended by the Oil Pollution Act of 1990 (Pub. L. 101-830).

3.2 Compliance Status of the Regulatory Requirements

3.2.1 Designation of Hazardous Substances, 40 CFR §302.4

The elements and compounds and hazardous wastes appearing in Table 302.4 are designated as hazardous substances. A solid waste, as defined in 40 CFR §261.2, which is not excluded from regulation as a hazardous waste under 40 CFR §261.4(b), is a hazardous substance if it exhibits any of the characteristics identified in 40 CFR §§261.20 through 261.24.

Listed and characteristic hazardous wastes generated at the WIPP site have been identified. A waste stream profile is maintained for each identified site-generated waste stream.

The WIPP Waste Information System (WWIS) contains the listed waste codes, characteristic waste codes, and radionuclides for waste received from generator sites for disposal at WIPP.

3.2.2 Determination of Reportable Quantities, 40 CFR §302.5

The quantity listed in the column "Final RQ" for each substance in Table 302.4 or in Appendix B to Table 302.4 is the RQ for that substance.

Reportable quantities listed in Table 302.4 and Appendix B to §302.4 are used for reporting purposes at WIPP. The listed RQ is used to determine if releases of pure materials or hazardous constituents in mixtures are reportable.

3.2.3 Notification Requirements, 40 CFR §302.6(a)

Any release of a hazardous substance in a quantity equal to or exceeding the RQ determined in 40 CFR §302.5 in any 24-hour period shall immediately be reported to the National Response Center at (800) 424-8802.

In May 2001 a release of lead was reported to the National Response Center, the State Emergency Response Commission (SERC), and the Eddy County Local Emergency Planning Committee (LEPC). Subsequent analysis of the release determined that it was not reportable under CERCLA, or any other regulations, due to the lead particle size and the containment of the release to the WIPP property. Appropriate remediation of the release was completed. Soil samples showed no elevated lead levels and confirmed completion of clean-up activities. Follow-on reports sent to the three agencies explained the actions taken at the release location and the basis for the nonreportable determination.

3.2.4 Releases of Mixtures or Solutions, 40 CFR §302.6(b)(1)(i) and (ii)

If the quantity of all hazardous constituents of the mixture or solution is known, notification is required where reportable quantities or more of any hazardous constituent is released. If the quantity of one or more of the hazardous constituents of the mixture or solution is unknown, notification is required where the total amount of the mixture or solution released equals or exceeds the reportable quantities for the hazardous constituent with the lowest RQ.

The reportable releases of hazardous constituents in mixtures are determined and reported as required in §§302.5 and 302.6(a) of 40 CFR. During this reporting period, there were no releases of mixtures or solutions that exceeded the RQs of any hazardous constituents.

3.2.5 Notification of Releases of Radionuclides, 40 CFR §302.6(b)(2)

Radionuclides are subject to these notification requirements only in the following circumstances:

- *The identity and quantity (in curies) of each radionuclide in a released mixture or solution is known and the sum of the ratios (quantity released in curies/RQ for the radionuclide) for each radionuclide in the mixture or solution is equal to or greater than 1.*
- *The identity of each radionuclide in a released mixture or solution is known but the quantity released (in curies) of one or more of the radionuclides is unknown and the total quantity (in curies) of the mixture or solution is equal to or greater than the lowest quantity of any individual radionuclide in the mixture or solution.*
- *The identity of one or more radionuclides in a released mixture or solution is unknown and the total quantity (in curies) released is equal to or greater than either 1 curie or the lowest RQ of any known individual radionuclide in the mixture or solution, whichever is lower.*

There have been no releases of radionuclides at the WIPP facility.

3.2.6 Notification of the Release of Heavy Metals, 40 CFR §302.6(d)

Except for releases of radionuclides, notification of the release of a RQ of solid particles of antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, or zinc

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

is not required if the mean diameter of the particles released is larger than 100 micrometers.

Except for the release of lead as noted above, there have been no releases of heavy metals from the WIPP facility.

4.0 EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

4.1 Summary of the Law

Title III of the SARA, otherwise known as the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. §§11001 et seq.), authorizes a nationwide program of emergency planning as protection against accidents involving hazardous chemicals and extremely hazardous substances. The act also requires a comprehensive body of information about hazardous substances to be submitted to various state and local groups. Under Subtitle A, "Emergency Planning and Notification," facilities are required to make various notifications to the SERC and the LEPC. These include notification of applicability under EPCRA, designation of a facility Emergency Coordinator, and notification of extremely hazardous substance releases to the environment. Subtitle B, "Reporting Requirements," requires the submittal of information such as inventories of specific hazardous chemicals used or stored within a facility to the SERC, LEPC, and the fire department that has jurisdiction over the facility. Within Subtitle B, the following sections outline specific reporting requirements: (1) Section 311, "Material Safety Data Sheets," directs the submission of a Material Safety Data Sheet (MSDS) for each hazardous chemical present or a list of hazardous chemicals present that require an MSDS; (2) Section 312, "Emergency and Hazardous Chemical Inventory Forms," directs the annual submission of an inventory of hazardous chemicals present during the preceding year; and (3) Section 313, "Toxic Chemical Release Forms," outlines requirements for facilities to submit a toxic chemical release report to the EPA and the resident state if toxic chemicals are used at that facility in excess of established threshold amounts.

The regulations under 40 CFR Part 355, "Emergency Planning and Notification," established the list of extremely hazardous substances, the threshold planning quantities, and facility notification responsibilities necessary for the development and implementation of state and local emergency response plans.

The regulations of 40 CFR Part 370, "Hazardous Chemical Reporting: Community Right-to-Know," established reporting requirements that provide the public with vital information on the hazardous chemicals in their communities, with the intent of ensuring enhanced community awareness of chemical hazards and facilitating the development of state and local emergency response plans.

In order to inform the public and surrounding communities of releases of toxic chemicals, 40 CFR Part 372, "Toxic Chemical Release Reporting: Community Right-to-Know," established requirements for the submission of information relating to the release of toxic chemicals under Section 313. Effective February 16, 2001, the EPA

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

lowered the reporting threshold for lead and lead compounds to 100 pounds. Lead contained in stainless steel, brass, and bronze alloys is excluded from this reporting threshold. The lowered threshold applied to the CY 2001 Toxic Release Inventory report.

4.2 Compliance Status of the Regulatory Requirements

4.2.1 Emergency Planning, 40 CFR §355.30(a)

The requirements of this section apply to any facility at which there is present any extremely hazardous substance [as defined in 40 CFR Part 355] equal to or in excess of its threshold planning quantity.

The WIPP facility is subject to the emergency planning requirements because it uses sulphuric acid, which has a threshold planning quantity of 1,000 pounds. Sulphuric acid used at the WIPP facility is generally contained in lead-acid batteries. Small amounts are in the liquid form.

4.2.2 Emergency Planning Notification, 40 CFR §355.30(b)

The owner or operator of a facility shall notify the Commission that it is subject to the emergency planning requirements.

In 1987, the DOE made the one-time notification to the SERC that the WIPP facility is subject to emergency planning requirements.

4.2.3 Facility Emergency Coordinator, 40 CFR §355.30(c)

The facility shall designate a facility representative who will participate in the local emergency planning process as a facility emergency response coordinator.

The MOC appointed a WIPP representative to the LEPC, which began in 1994. The LEPC meets once a month. Emergency Management is responsible for WIPP's emergency response and preparedness programs at the WIPP facility.

4.2.4 Provision of Information, 40 CFR §355.30(d)

The owner or operator of a facility will inform the LEPC of any changes occurring at the facility that may be relevant to emergency planning.

The CBFO, or its MOC, provides information to the LEPC regarding changes at the facility which may be relevant to emergency planning. The last notification was made to the LEPC with the latest update of the WIPP emergency management program on September 17, 2001.

4.2.5 Emergency Release Notification, 40 CFR §355.40

The owner or operator of a facility shall immediately notify the community emergency coordinator for the LEPC of any area that is likely to be affected by the release and the SERC of any state likely to be affected by the release.

In May 2001 a release of lead was reported to the National Response Center, the SERC, and the Eddy County LEPC. Subsequent analysis of the release determined that it was not reportable under CERCLA, or any other regulations, due to the lead particle size and the containment of the release to the WIPP property. Appropriate remediation of the release was completed. Soil samples showed no elevated lead levels and confirmed completion of clean-up activities. Follow-on reports sent to the three agencies explained the actions taken at the release location and the basis for the nonreportable determination.

4.2.6 Material Safety Data Sheet Reporting, 40 CFR §370.21

The owner or operator of a facility shall submit a material safety data sheet (MSDS) for each hazardous chemical present at the facility according to the minimum threshold schedule to the committee, the commission, and the fire department with jurisdiction over the facility. In lieu of the submission of an MSDS, the owner or operator may submit a list of hazardous chemicals for which an MSDS is required.

The list of hazardous chemicals is updated when new chemicals in excess of the Threshold Planning Quantity (TPQ), or 10,000 pounds; or additional hazard information for existing chemicals are received at WIPP. The MOC submitted the last updated list of hazardous chemicals which are present at the WIPP facility in amounts that exceed the threshold planning quantities on August 18, 1999. This list also included the common name of the chemical and the hazardous components.

4.2.7 Inventory Reporting, 40 CFR §370.25

The owner or operator of a facility shall submit an inventory form to the SERC, LEPC, and the fire department with jurisdiction over the facility for hazardous chemicals at the facility during the preceding calendar year by March 1 of each year.

The CBFO submitted the latest Tier II Emergency and Hazardous Chemical Inventory Report to the SERC, LEPC, and the fire departments that maintain Memorandums of Understanding (MOUs) with the CBFO regarding the WIPP facility on February 22, 2002.

4.2.8 Reporting Requirements and Schedule for Reporting, 40 CFR §372.30

For each toxic chemical known by the owner or operator to be manufactured, processed, or otherwise used in excess of an applicable threshold quantity at its covered facility for a calendar year, the owner or operator must submit to the EPA and to the state a completed EPA Form R.

During this reporting period, the WIPP facility was not subject to Form R reporting under 40 CFR §372.38, "Exemptions." Products in excess of the threshold quantity were either contained in enclosed systems or fell under the Motor Vehicle Use exemption. The lowered recording thresholds for lead and lead compounds were not exceeded at WIPP.

5.0 ATOMIC ENERGY ACT AND THE ENVIRONMENTAL PROTECTION AGENCY

5.1 Summary of the Law

The Atomic Energy Act (AEA) of 1954, as amended (42 U.S.C. §§2011 et seq.), initiated a national program for research, development, and use of atomic energy for both national defense and domestic civilian purposes.

The authority of the EPA to establish generally applicable standards for the protection of the public and the environment from radiation is derived from the AEA, as amended; Reorganization Plan No. 3 of 1970; and the Nuclear Waste Policy Act (NWPA) (Pub. L. 97-425). The protection standards found in 40 CFR Part 191 apply to both spent nuclear fuel and high-level radioactive waste as defined by the NWPA, and to TRU waste, which contains more than 100 nanocuries per gram of waste of alpha-emitting TRU isotopes with half-lives greater than 20 years. The standards of 40 CFR Part 191 consist of three subparts: Subpart A, "Environmental Standards for Management and Storage"; Subpart B, "Environmental Standards for Disposal"; and Subpart C, "Environmental Standards for Groundwater Protection."

Subpart A, "Standards for Management and Storage," sets the operational term requirements limiting annual doses to members of the public from management and storage operations at disposal facilities operated by the DOE and not regulated by either the U.S. Nuclear Regulatory Commission (NRC) or by agreement states. The annual dose equivalent, from all sources, to any member of the public in the general environment may not exceed 25 millirem (mrem) to the whole body and 75 mrem to any critical organ.

The EPA audits the DOE's compliance with Subpart A of 40 CFR Part 191. Since these regulations were promulgated by the EPA, they are discussed in this chapter rather than in Chapter 13.0, Atomic Energy Act and the U.S. Department of Energy. Because Subpart A only contains environmental performance standards, implementation details are left to the responsible agency. The EPA issued guidance for implementation of

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

Subpart A, which includes methods for dose calculation, modeling, and reporting. In March of 2000, the DOE issued the Implementation Plan for 40 CFR 191, Subpart A (DOE, 2000), which adopts the EPA's guidance and outlines the 40 CFR Part 191 compliance program.

The EPA has certification authority for Subparts B and C of 40 CFR Part 191. As required by the WIPP LWA in Section 8(d)(2), the EPA certified on May 18, 1998 (63 FR 27353) that the WIPP facility was in compliance with 40 CFR Part 191, Subparts B and C. This certification decision was made after careful consideration and evaluation of the DOE's Compliance Certification Application (DOE, 1996a). The application was submitted to the EPA on October 29, 1996, as specified in the WIPP LWA Section 8(d)(1), and demonstrates compliance with the provisions of Subparts B and C.

5.2 Compliance Status With the Regulatory Requirements

The compliance status of each of the applicable requirements is summarized in the text under Subsection 5.2.1 below for the environmental radiation protection disposal standards.

5.2.1 Radiation Protection Standards, 40 CFR Part 191

The requirements of 40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Wastes," apply to WIPP as of March 26, 1999, when the first shipment of TRU waste was received and emplaced for permanent disposal.

5.2.1.1 Standards, 40 CFR §191.03(b) (Subpart A)

The combined annual dose equivalent to any member of the public shall not exceed 25 mrem to the whole body and 75 mrem to any critical organ.

The results of environmental monitoring and dose calculations have shown no releases of radionuclides that may affect the public. The MOC has conducted periodic confirmatory sampling since receipt of waste began in March 1999. Results of the MOC monitoring program demonstrate compliance with the 40 CFR §191.03 standards.

Monitoring results for CY 2000 and CY 2001 can be found in Appendix B to this report. For CY 2001, the EDE from normal operations at the WIPP DOE Exclusive Use Area located 350 meters was less than 9.7E-05 mrem per year to the maximally exposed individual, and 1.69E-03 for the critical organ. In addition for CY 2001, the EDE from normal operations beyond the WIPP Land Withdrawal Area located 7,500 meters was less than 4.37E-06 mrem per year to the maximally exposed individual, and less than 7.60E-05 for the critical organ. These results are well below the 25 mrem per year limit to the whole body, and the 75 mrem per year limit to any critical organ as required by 40 CFR Part 191, Subpart A, Section 191.03(b). For CY 2000, the EDE from normal

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

operations at the WIPP DOE Exclusive Use Area located 350 meters was less than $9.07\text{E-}05$ mrem per year to the maximally exposed individual, and $1.58\text{E-}03$ for the critical organ. In addition for CY 2000, the EDE from normal operations beyond the WIPP Land Withdrawal Area located 7,500 meters was less than $5.20\text{E-}06$ mrem per year to the maximally exposed individual, and less than $9.05\text{E-}05$ for the critical organ. These results are well below the 25 mrem per year limit to the whole body, and the 75 mrem per year limit to any critical organ as required by 40 CFR 191, Subpart A, Section 191.03(b).

5.2.1.2 Containment Requirements 40 CFR §191.13 (Subpart B)

The disposal systems for spent nuclear fuel or high-level or TRU radioactive waste shall be designed to provide a reasonable expectation that the cumulative releases to the accessible environment for 10,000 years shall have a likelihood of less than one chance in ten of exceeding the quantities calculated according to Table I (Appendix A) and less than one chance in 1,000 of exceeding ten times the quantities calculated in accordance with Table I.

These requirements were addressed in the DOE application for certification. The EPA certified the DOE's compliance in 1998.

5.2.1.3 Individual Protection Requirements, 40 CFR §191.15 (Subpart B)

Disposal systems for waste and any associated radioactive material shall be designed to provide a reasonable expectation that, for 10,000 years after disposal, undisturbed performance of the disposal system shall not cause the annual committed effective dose (calculated in accordance with Appendix B of this Part) to exceed 15 mrem.

These requirements were addressed in the DOE application for certification. The EPA certified the DOE's compliance in 1998.

5.2.1.4 Groundwater Protection Standards, 40 CFR §191.24 (Subpart C)

Disposal systems for waste and any associated radioactive material shall be designed to provide a reasonable expectation that, for 10,000 years after disposal, undisturbed performance of the disposal system shall not cause levels of radioactivity in any underground source of drinking water, in the accessible environment, to exceed the limits specified in 40 CFR Part 141 as they exist on January 19, 1994.

These requirements were addressed in the DOE application for certification. The EPA certified the DOE's compliance in 1998.

5.2.2 WIPP Compliance Certification Criteria, 40 CFR Part 194

The WIPP LWA requires the EPA to establish criteria by which to certify that the DOE will comply with the radioactive waste disposal standards of 40 CFR Part 191, Subparts B and C. The EPA issued these criteria on February 9, 1996 (61 FR 5224 through 5245). The DOE submitted its application for certification on October 29, 1996. The EPA conducted two public hearings regarding the DOE's application and certified the DOE's compliance on May 18, 1998 (61 FR 27353 through 27406).

Since certification, the DOE has complied with the reporting requirements of the certification. These reporting requirements were established so the EPA will be notified in a timely manner in the event of a change that may affect the WIPP certification. During this reporting period, specific information about changes at WIPP has been provided periodically to the EPA, including an annual change report submitted in November of each year. The DOE has also implemented monitoring programs designed to detect substantial and detrimental deviations from the basis used for certification. No such deviations have occurred.

6.0 CLEAN AIR ACT

6.1 Summary of the Law

The Clean Air Act (CAA), as amended, establishes a national regulatory strategy and program to protect and enhance air quality in the United States. The CAA includes a number of standards, requirements, and permit programs to protect the quality of air in attainment areas (areas in which air quality meets the appropriate standards) and to improve it in nonattainment areas (areas that do not meet the national primary or secondary ambient air-quality standard for an air pollutant).

Congress enacted the Clean Air Act Amendments of 1990 (CAAA) (Pub. L. 101-549) on November 15, 1990.

6.1.1 Title I, *Air Pollution Prevention and Control*

Title I of the CAA contains requirements and standards for a number of programs that govern air pollutant emissions from stationary sources. These include the National Ambient Air Quality Standards (NAAQSs), the New Source Performance Standards (NSPSs), the National Emission Standards for Hazardous Air Pollutants (NESHAPs), the Prevention of Significant Deterioration (PSD) program, and requirements for nonattainment areas. Most of these programs are requirements for proposed new construction or for modifications of existing sources.

6.1.1.1 National Ambient Air Quality Standards, 40 CFR §§ 50.4 through 50.12, and 40 CFR Part 51

This program was established by Title I of the CAA (and revised by Title I of the CAAA) for the six "criteria" pollutants: sulfur dioxide, particulate matter, carbon monoxide,

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

ozone, nitrogen dioxide, and lead. These standards establish the maximum levels of each pollutant allowed in the air within a particular area. The federal NAAQS are specified in 40 CFR §§50.4 through 50.12, and the program is implemented under 40 CFR Part 51. The EPA has authorized the NMED to administer the NAAQS program. The federal NAAQS were superseded by the New Mexico Ambient Air Quality Standards for the six criteria pollutants. The two backup diesel electrical power supply generators at WIPP are not subject to NAAQS regulations. They are regulated under New Mexico regulations, and compliance with these regulations is discussed in Chapter 28.0, New Mexico Air Quality Control Act, herein.

6.1.1.2 Prevention of Significant Deterioration Program, 40 CFR §51.166

The PSD program, like many of the other programs under the CAA, is designed for proposed new construction or the modification of existing facilities. It pertains to any proposed new or modified facility to be located in an attainment area, particularly if the facility could impact the air quality in a national park, wilderness area, monument, seashore, or other areas of special national or regional natural, recreational, scenic, or historic value. Because WIPP does not emit over 100 tons per year (tpy) of any criteria pollutant, WIPP is not categorized as a major source, as defined in 40 CFR §51.166(b)(1)(i)(a), and the PSD program does not apply. WIPP's routine review and approval process is used to evaluate proposed actions and identify potential regulatory issues such as the applicability of PSD.

6.1.1.3 New Source Performance Standards, 40 CFR Part 60

The NSPS program regulates emissions from operating facilities and specifies emission standards and test methods for analyzing the emissions. This program, which was initiated by Section 111 of the CAA and is implemented by 40 CFR Part 60, "Standards of Performance for New Stationary Sources," specifies standards of performance for air pollutant emissions from different types of facilities and equipment. Pollutants that are regulated under the NSPS include sulfur dioxide, nitrogen oxides, particulate matter, visible emissions (opacity), carbon monoxide, volatile organic compounds (VOCs), and lead. Since the EPA has authorized the NMED to administer the NSPS program, the NMED requirements supersede the federal requirements. The two backup diesel generators at WIPP not subject to NSPS regulations. They are regulated under the state program, which is discussed in Chapter 28.0 herein.

6.1.1.4 National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61

Hazardous air pollutant emissions from specific source categories are regulated under Section 112 of the CAA (Title III of the CAAA) as implemented by 40 CFR Part 61, "National Emission Standards for Hazardous Air Pollutants." Before the CAA was amended in 1990, Subpart A of NESHAP listed only eight hazardous air pollutants (HAPs). These pollutants are asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. The CAAA (§301) added 181 HAPs, bringing the list of HAPs regulated under Subpart A to 189.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The EPA's analysis of source categories found that no NESHAP is needed for operation of the WIPP facility, because WIPP is subject to 40 CFR Part 191, Subpart B. However, it is DOE policy that the MOC will implement the requirements of 40 CFR Part 61, Subpart H, "National Emission Standards for Radionuclides Other Than Radon from Department of Energy Facilities." (See 1995 Memorandum of Understanding Between the U.S. Environmental Protection Agency and the Department of Energy concerning the Clean Air Act Emission Standards for Radionuclides, 40 CFR Part 61, including Subparts H, I, Q, and T.)

The NESHAP standard for Subpart H (40 CFR §61.92) states that emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent (EDE) of 10 mrem per year. An application must be filed for any new construction or modifications if the anticipated EDE will exceed 1.0 percent of the standard. WIPP radionuclide emissions were calculated to cause an EDE of less than 1.0 percent of the 10-mrem-per-year standard. The expected levels of radionuclide emissions were reported to the EPA in the NESHAP data package.

An emissions sampling system was installed to comply with NESHAP and to meet periodic confirmatory measurement requirements. Emissions sampling test results are used to verify compliance with Subpart H. Additionally, WIPP's routine review and approval process is used to evaluate proposed actions and identify potential regulatory issues such as changes to radionuclide emissions.

6.1.2 Title II, *Emission Standards for Mobile Sources*

Although most of the requirements under the CAA pertain to stationary sources, the requirements under Title II of the CAA and the CAAA pertain to mobile sources and establish standards for motor vehicles and fuel. Many of these requirements are aimed at automobile manufacturers and petroleum companies (e.g., Part A of Title II, "Motor Vehicle Emission and Fuel Standards"). Federal agency fleets are covered in §248 of the CAA. In accordance with the DOE's Alternative Fuel Transportation Program (10 CFR Part 490), and the Energy Policy Act of 1992 (Pub. L. 102-486), federal agencies that operate fleets in nonattainment areas for ozone and/or carbon monoxide are required to use clean-fuel vehicles and must use clean alternative fuels when operating in the nonattainment area. The DOE published its new Alternative Fuel Transportation Program in the *Federal Register* on March 14, 1996. Since it must be adopted only by federal agencies that operate a fleet with at least 20 light-duty vehicles in a metropolitan statistical area or a consolidated metropolitan statistical area with a 1980 population of at least 250,000 people, these new regulations do not apply to Carlsbad, which is the closest population center to WIPP. In addition, most of the requirements for federal agency fleets under Title II are not applicable to WIPP because this facility is not located in a nonattainment area. Regulations (61 FR 3832, 40 CFR Part 80) make the purchaser/consumer of gasoline products or his or her agent liable for using gasoline containing lead (i.e., more than 0.05 gram of lead per gallon) or lead additives for highway use after December 31, 1995. This new provision is now incorporated into this section (see Subsection 6.2.3.2 herein).

6.1.3 Title III, *General Provisions*

Title III of the CAA provides general provisions for the administration of the CAA and pertains to all titles. The provisions of Title III include administration, federal procurement, suits, audits, and air quality monitoring and modeling. It does not add additional programs. Title III of the CAA also requires that the EPA perform a comprehensive analysis of the impact of the CAAA.

6.1.4 Title IV, *Acid Deposition Control*

Title IV of both the CAA and the CAAA is aimed primarily at utilities and power plants that emit large quantities of sulfur dioxide and/or nitrogen oxides. It seeks to reduce emissions of sulfur dioxide and nitrogen oxides to decrease the acid rain problem in the United States. It is not applicable to WIPP.

6.1.5 Title V, *Permits*

Most of the other permitting programs under the CAA are designed primarily for proposed new construction or the modification of existing facilities. Title V of both the CAA and the CAAA, as promulgated in 40 CFR Part 70, "State Operating Permit Programs," identifies the operating permit requirements for major stationary sources. Those facilities required by the state or by the EPA to have an operating permit will be expected to submit an operating permit application, a compliance plan, and periodic compliance reports.

The EPA promulgated final approval of the state of New Mexico operating permit program and it became effective on January 27, 1997. The state's program was established as "Operating Permits" and "Operating Permit Emission Fees" in 20.2.70 NMAC and 20.2.71 NMAC, respectively. The operating permit program is now discussed in Chapter 28.0 herein.

The federal program (40 CFR Part 70) regulates and requires permits for both area and major sources. Major-source emission thresholds are used to determine which facilities require operating permits for both area and major sources under 40 CFR Part 70 and 20.2.70 NMAC and 20.2.71 NMAC. The air emissions initial inventory was also used to determine if WIPP is a major source as defined in 40 CFR Part 70 and 20.2.71 NMAC. A facility is considered a "major source" and is required to obtain an operating permit if the facility emits at least 100 tpy of any pollutant, 10 tpy of any single HAP, or 25 tpy of any combination of HAPs. Based on inventory emission calculations, WIPP is not a major source and is not currently required to obtain a federal CAA operating permit. WIPP's routine review and approval process is used to evaluate proposed actions and identify potential regulatory issues such as the applicability of Title V permits.

6.1.6 Title VI, *Stratospheric Ozone Protection*

Title VI of both the CAA and the CAAA places restrictions on and phases out the use of ozone-depleting chemicals, particularly chlorofluorocarbons (CFCs). It is implemented

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

by 40 CFR Part 82, "Protection of Stratospheric Ozone." These regulations are designed to phase out the use of Class I and Class II substances. Class I substances are CFCs, halons, carbon tetrachloride, methyl chloroform, hydrobromofluorocarbons, and methyl bromide. Class II substances are hydrochlorofluorocarbons, which generally have a lower ozone-depleting potential than do CFCs. The production of most Class I substances was prohibited as of January 1, 1996 (methyl bromide is prohibited as of January 1, 2005). Effective January 1, 2015, the use of Class II substances will be prohibited unless the substance is used and entirely consumed in producing other chemicals; or is used as a refrigerant in appliances manufactured prior to January 1, 2020 (40 CFR §82.4[r]). By January 1, 2030, the manufacture of all Class II substances will also be prohibited (40 CFR §82.4[s]).

Implementing regulations pertaining to labeling requirements and the use and disposal of Class I substances during the service, repair, or disposal of appliances and industrial process refrigeration codified in 40 CFR Part 82, Subpart E. Recycling equipment registrations and training certifications were received from all WIPP refrigerant recycling contractors.

Most of the requirements pertaining to ozone-depleting substances (ODSs) such as CFCs are applicable primarily to manufacturers of the chemicals, products containing the chemicals, or products in which ODSs are used during the manufacturing process. These regulations are applicable to WIPP in that these products will no longer be available after the time specified in the regulations. Replacement products must be found. Any container in which Class I or Class II substances (including waste) will be transported must have a warning label as required by 40 CFR §82.106, "Warning Statement Requirements." The WIPP WAC allows no pressurized containers to be transported in the Transuranic Package Transporter Model II (TRUPACT-II) containers. Wastes destined for WIPP will not include containers with Class I or Class II substances, and the labeling requirements for Class I and Class II substances are not applicable to TRU wastes destined for WIPP.

6.2 Compliance Status With the Regulatory Requirements

6.2.1 Control of Pollution from Federal Facilities, CAA §118

Each department of the executive, legislative, and judicial branches of the federal government having jurisdiction over any property or facility or engaged in any activity resulting in or that may result in the discharge of air pollutants and each employee thereof is subject to and must comply with all federal, state, interstate, and local requirements respecting the control and abatement of air pollution in the same manner and to the same extent as any nongovernmental entity.

The DOE complies with all federal and state requirements pertaining to the release of air pollutants that apply to WIPP. Compliance with federal and state air-quality requirements are described in this section and in Chapter 28.0 herein, respectively.

6.2.2 National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities, 40 CFR Part 61, Subpart H

The NESHAP for radionuclides other than radon from DOE facilities is EDE of 10 mrem per year to any member of the public.

Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," of 40 CFR Part 61 requires that facilities owned or operated by the DOE that emit any radionuclides other than radon-222 and radon-220 into the air are subject to this regulation.

Based on the May 1995 Memorandum of Understanding Between the U.S. Environmental Protection Agency and the U.S. Department of Energy Concerning the Clean Air Act Emission Standards for Radionuclides 40 CFR 61 Including Subparts H, I, Q, and T, WIPP is subject to the emissions standard that specifies that no member of the public may receive an EDE of 10 mrem per year in any year. In May 1994, modeling was performed for NESHAP compliance using the CAP-88 code, which resulted in an estimated EDE of 4.04E-04 mrem per year. These calculated values are well below 1.0 percent of the regulatory limit of 10 mrem per year. In November 1995, the DOE issued the WIPP Safety Analysis Report (SAR) (DOE, 1995). The SAR and current amendments indicate that normal operations at WIPP are not expected to entail any releases of airborne radioactive materials, thus the EDE to the public would be undetectable. The EPA further states in 40 CFR §61.93(b)(4)(i) that "For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to verify the low emissions." The WIPP Effluent Monitoring Program is currently in place to meet this requirement.

6.2.2.1 NESHAP Prestart-Up Notification, 40 CFR §61.09(a)(1)

The EPA will be notified of planned start-up between 30 and 60 days prior to start-up.

On February 23, 1999, the DOE submitted prestart-up notification letters to the EPA Administrator and to the EPA Region VI office to inform them of the impending start-up of WIPP, scheduled for late March 1999. The actual start-up date was March 26, 1999. These letters met the time frame requirements for notification.

6.2.2.2 NESHAP Poststart-Up Notification, 40 CFR §61.09(a)(2)

The EPA will be notified of actual start-up of WIPP within 15 days after that date.

On March 26, 1999, notification letters of actual start-up were submitted to the EPA. These letters met the time frame requirements for notification of actual start-up.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

6.2.2.3 Emissions Monitoring and Test Procedures, 40 CFR §61.93(a), (b)

Compliance with the standards, radionuclide emissions, shall be determined and Effective Dose Equivalent (EDE) values to members of the public calculated using EPA-approved sampling procedures, computer models, or other procedures for which the EPA has granted prior approval. Radionuclide emission rates from point sources shall be measured at all release points which have a potential to discharge radionuclides into the air in quantities which could cause an EDE in excess of 1.0 percent of the standard. For other release points, periodic confirmatory measurements shall be made to verify the low emissions.

The WIPP facility has three emission points, Stations A, B, and C, which could release airborne radionuclides to the environment. At each emission point, the WIPP facility uses skid-mounted fixed air samplers (FASs) to collect representative samples of airborne particulates. Approved and controlled operating procedures are used at the WIPP facility to ensure that uniform methods are used to collect, package, and transport FAS filters. Station A FAS filters are collected at least once each working shift to assure a representative sample. Station B FAS filters are collected at least weekly and at the end of each underground effluent filtration event. Station C FAS filters are collected at least weekly. Samples are composited on a monthly or quarterly basis, depending on sample location and the number of samples collected. These particulate filters are initially analyzed for gross alpha and gross beta activities. Filters from all three stations are typically analyzed for plutonium 238, 239 and 240, and americium 241. The composite sample results are summed to obtain a total quantity for each radionuclide released from each effluent point. These values are used as input into the CAP88-PC software package to calculate the EDE to members of the public for the purpose of demonstrating compliance with 40 CFR §61.92.

The CY 2001 Annual Periodic Confirmatory Measurement Compliance Report for the DOE was sent to EPA Region VI on June 25, 2002. The calculated dose from normal operations at WIPP was less than 4.96E-06 mrem per year to the maximally exposed individual. This is well below the 10 mrem per year limit and the 0.1 mrem per year limit for periodic confirmatory sampling required by 40 CFR §61.93(a), (b).

6.2.2.4 NESHAP Quality Assurance Program Plan, 40 CFR §61.93(b) and Appendix B, Method 114, Section 4.10

A NESHAP Quality Assurance Program is required for facilities subject to Subpart H of NESHAP.

A QA program plan for sampling radionuclide emissions to the ambient air at WIPP is in place.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

6.2.2.5 NESHAP Annual Report, 40 CFR §61.94

A NESHAP annual report must be submitted by June 30th for facilities subject to Subpart H of NESHAP.

The DOE will file a NESHAP report by June 30 every year as long as the facility is subject to these regulations. The report is for the previous calendar year. Monitoring results for the CY 2000 and CY 2001 can be found in Appendix B to this report.

6.2.2.6 Record-Keeping Requirements, 40 CFR §61.95

All facilities must maintain records documenting the source of input parameters, including the results of all measurements upon which they are based, the calculations and/or analytical methods used to derive values for input parameters, and the procedure used to determine the EDE. This documentation should be sufficient to allow an independent auditor to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the site of the facility for at least five years and, upon request, be made available for inspection by the EPA Administrator or his or her authorized representative.

Monitoring for airborne radioactive emissions has been performed at WIPP since 1988. All applicable records are maintained on-site for at least five years and are available for examination if requested by the EPA Administrator or an authorized representative. The results of the measurements, supporting calculations, analytical methods, and procedure used to determine the EDE are all included in the records.

6.2.2.7 NESHAP Application for Radionuclides, 40 CFR §61.96

The submittal of a NESHAP application is required prior to construction or modification of any DOE facility that will emit radionuclides to the air.

Under NESHAP if the estimated annual EDE is less than 1.0 percent of the standard, no application is required. Since the estimated EDE for WIPP is well below this number, no application was required for compliance with Subpart H of NESHAP at WIPP.

6.2.2.8 Prevention of Accidental Releases, CAA, §112(r)

A risk management plan/hazard assessment must be prepared, if applicable.

The list of regulated substances for accidental release prevention under §112(r) of the CAA and the threshold quantities for these substances have been finalized in 40 CFR Part 68, "Chemical Accident Prevention Provisions." In order to comply with

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Subpart B of 40 CFR Part 68, two documents were used to determine whether emissions from WIPP exceed the regulatory threshold level of any of the chemicals listed in the final rule. The two documents are the Air Emissions Inventory Report for Calendar Year 1999 for WIPP (Westinghouse Waste Isolation Division, 2000) and the WIPP Tier II Emergency and Hazardous Chemical Inventory Report, last filed in February 2002, as required by the EPCRA. It was found that, of the 162 substances and gases listed in the final rule, none at WIPP meet or exceed the final threshold levels. WIPP is not currently required to develop a risk management plan to evaluate accidental releases from the site.

6.2.3 State Operating Permit Programs, 20.2.70 NMAC and 20.2.71 NMAC

The requirements for operating permits include a provision that state programs must provide for permitting of "any source, including an area source (i.e., a source of the pollutant that is not a major source), subject to a standard or other requirement under §112 of the [Clean Air] Act." (See Section 70.3[a][3], which is the section on NESHAP.) Based on emission calculations in the 1999 inventory, emissions at WIPP are below "major source" and NESHAP emission limits. The permitting and reporting requirements contained in 20.2.70 NMAC and 20.2.71 NMAC are not applicable at this time. WIPP's routine review and approval process is used to evaluate proposed actions and identify potential regulatory issues such as the applicability of 20.2.70 NMAC and 20.2.71 NMAC.

In 2000, the Air Emissions Inventory Report for Calendar Year 1999 was completed. This inventory report was developed to calculate maximum potential hourly and annual emissions of criteria pollutants, the regulated NESHAP pollutants, and the New Mexico toxic air pollutants specified under 20.2.72 NMAC and 20.2.78 NMAC. Emission estimates were used to determine if the CBFO is required to obtain air permits for WIPP under state regulations. Based on the 1999 WIPP inventory, HAP emissions from the facility are below current operating permit threshold levels, and an operating permit is not required for WIPP.

Since the state has an operating permit program in place, the applicable state requirements for an operating permit program are discussed in Chapter 28.0 herein. Federal requirements for an operating permit program are limited to leaded fuel prohibitions at 40 CFR Part 80.

6.2.3.1 Reporting Information about Gasoline Represented as Being Unleaded at the Request of the EPA, 40 CFR §80.7

If the Administrator, the Regional Administrator, or a delegate has reason to believe that a violation of the CAA or its implementing regulations with respect to the use of prohibited fuel (e.g., leaded) has occurred, he or she may require that any wholesale purchaser/consumer report information regarding receipt, transfer, delivery, or sale of gasoline represented to be unleaded and to allow the reproduction of such information at all reasonable times.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The purchaser/consumer is also required to provide any other information to the EPA representative as requested to enable him/her to ensure that the purchaser/consumer acted in compliance with the applicable provisions of the CAA and the implementing regulations.

No instances are known to have occurred in which prohibited fuel was used at WIPP.

6.2.3.2 Prohibition against Dispensing Gasoline Containing Lead or Lead Additives, 40 CFR §80.22

After December 31, 1995, no person shall dispense or supply any gasoline produced with the use of lead additives or that contains more than 0.05 gram of lead per gallon, nor shall he or she supply or dispense gasoline represented to be unleaded unless it meets the criteria specified in 40 CFR §80.2(g) or allow gasoline other than unleaded to be dispensed into any motor vehicle that is equipped with a gasoline tank filler inlet designed for the introduction of unleaded gasoline.

There are no known instances in which the gasoline dispensed at WIPP has contained lead in concentrations exceeding 0.05 gram per gallon.

6.2.3.3 Liability for Violations, 40 CFR §80.23

In any case in which a wholesale purchaser-consumer or his or her employee or agent introduces gasoline other than unleaded into a motor vehicle equipped with a gasoline tank filler inlet designed for the introduction of unleaded gasoline, only the wholesale purchaser-consumer shall be deemed in violation.

There are no known instances in which a violation of these regulations has occurred at WIPP.

6.2.4 Protection of Stratospheric Ozone, 40 CFR Part 82

A number of requirements have been imposed that relate to CFCs and other ODSs. Most of these requirements pertain directly to manufacturers; however, because of the planned phaseout of these materials, the regulations will also impact users of these materials.

6.2.4.1 Restrictions on Repairing and Servicing Motor Vehicle Air Conditioners, 40 CFR §82.34

Effective August 13, 1992, no person repairing or servicing motor vehicles for consideration may perform any service on a motor vehicle air conditioner involving the refrigerant for the air

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

conditioner without using approved refrigerant recycling equipment and unless he or she has been properly trained and certified by a technician certification program approved by the Administrator.

No government vehicles are serviced, repaired, or maintained by WIPP employees. All equipment owned or used by the vendors that service these vehicles has been approved, and all the service technicians who perform such work are certified to work on motor vehicle air conditioners.

6.2.4.2 Prohibitions, 40 CFR §82.124(a)(4)

On or after May 15, 1993, no person may modify, remove, or interfere with any warning statement required by this subpart, except as described in §82.112.

Every appliance and product containing CFCs should have a label from the manufacturer. The MOC industrial safety and hazardous materials management programs and plan state that warning labels not be removed or tampered with. If a label is damaged and becomes unreadable, it is replaced.

6.2.4.3 Service, Maintenance, and Repair of Appliances Using Refrigerants, 40 CFR §82.150

This subpart applies to any person servicing, maintaining, or repairing appliances except for motor vehicle air conditioners. This subpart also applies to persons disposing of appliances, including motor vehicle air conditions. In addition, this subpart applies to refrigerant reclaimers, appliance owners, and manufacturers of appliances and recycling and recovery equipment.

Although no WIPP employees service, maintain, or repair appliances, these regulations apply to WIPP because the facility owns appliances and is responsible for the disposal of appliances. The MOC maintenance work instructions for recharging and reclaiming refrigerants and property management procedures dictate that WIPP appliances will be sold intact or the refrigerants removed by a certified recycling contractor.

6.2.4.4 Prohibitions Regarding Maintenance, Service, Repair, or Disposal of Appliances, 40 CFR §82.154

Prohibitions are specified for persons who maintain, service, repair, or dispose of appliances who may vent or otherwise release into the environment any Class I or Class II substance used as refrigerant in such equipment. De minimis releases associated with good faith attempts to recycle or recover refrigerants are not subject to this prohibition. No person may

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

dispose of appliances except for small appliances, motor vehicle air conditioners, and motor vehicle air conditioner-like appliances unless the required practices described in 40 CFR §82.156 are observed and equipment that is certified for that type of appliance is used. Prohibitions are also specified regarding recycling or recovery equipment.

Prohibitions also exist for the sale of Class I or Class II substances consisting wholly or in part of used refrigerants.

It is a violation of this subpart to accept a signed statement pursuant to 40 CFR §82.156(f)(2) if the person knew or had reason to know that such a signed statement is false.

No WIPP employees service, repair, or maintain appliances on-site. Before appliances are disposed of, refrigerant is evacuated by a certified contractor. No recycling or recovery equipment is owned by the facility. Only small appliances have been disposed of by WIPP personnel since the regulation took effect on July 13, 1993. All contractors have submitted a signed statement to the EPA that ensures compliance with and knowledge of applicable regulations and is included in the equipment certification form. Recycling and reclamation of appliances containing refrigerants used at WIPP are owned by certified contractors. No recycling or reclamation appliances have been altered since their certification.

No Class I or II substances are sold or distributed from WIPP.

6.2.4.5 Required Practices, 40 CFR §82.156

Effective July 13, 1993, any person opening appliances other than motor vehicle air conditioners must evacuate the refrigerant to a system receiver or to a recovery or recycling machine as specified. At least one piece of certified, self-contained recovery equipment must be available at his or her place of business.

Leaks in appliances containing refrigerant must be repaired as specified.

The contractors have indicated that this is done and work orders verify that this requirement is met. All recovery equipment owned/used by the contractors at WIPP is certified. All maintenance, service, and repair on applicable appliances is performed by one of the certified contractors, who have verified on the equipment certification form that they have complied with these regulations.

All equipment owned/used by the contractors at WIPP is self-contained. All applicable requirements of this section are being met.

No leaks were detected in the refrigeration units on-site during this reporting period.

6.3 Compliance Status of Permit Conditions

Currently, only the permit for the backup diesel electrical power supply generators is required for WIPP under the CAA. This permit is discussed in Chapter 28.0 herein.

7.0 FEDERAL WATER POLLUTION CONTROL ACT OF 1972 ("CLEAN WATER ACT")

7.1 Summary of the Law

The Federal Water Pollution Control Act of 1972 (33 U.S.C. §§1251 et seq.) is usually referred to as the "Clean Water Act" (CWA). The major program under this act is the National Pollutant Discharge Elimination System (NPDES). This program, discussed in §402 of the CWA, regulates the discharge of pollutants into navigable waters of the United States. The regulations implementing the NPDES that are relevant to the WIPP Project are found in 40 CFR Part 122, "EPA Administered Permit Programs: The National Pollutant Discharge Elimination System," which contains definitions and basic application requirements, standard permit conditions, and monitoring and reporting requirements for the NPDES program. However, because there are no point-source discharges into navigable waters from WIPP, the facility is not required to obtain a standard NPDES permit.

Of the other regulations that implement the NPDES program, only 40 CFR §122.21, "NPDES Permit Assessment for Sewage Sludge," could apply to WIPP. In order to meet the requirements of 40 CFR §122.21(c)(2), the DOE filed an NPDES sewage sludge information package with EPA Region VI, requesting a determination as to whether the facility will be required to obtain an NPDES sewage sludge discharge permit. Based on the determination made by the Regional Director, the DOE may be required to submit an Notice of Intent to obtain a sludge-discharge permit. Information submitted to the EPA was reviewed to determine whether the facility is a "treatment works treating domestic sewage." If it is, the EPA will notify the DOE when a "sludge only" application must be submitted.

Another implementing regulation under the CWA applicable to the WIPP Project is 40 CFR Part 112, "Oil Pollution Prevention," which includes criteria and guidelines for the preparation and implementation of a facility's spill prevention, control, and countermeasures (SPCC) plan.

7.2 Compliance Status of the Regulatory Requirements

7.2.1 SPCC Plan Requirements, 40 CFR §112.3

Requirements for the preparation and implementation of SPCC plans are specified under the "Oil Pollution Prevention" regulations of 40 CFR Part 112.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The WIPP SPCC plan was issued in November 1988. The revised plan was issued in June 2001.

7.2.2 Amendment of the SPCC Plan by the Owner/Operator, 40 CFR §112.5

Requirements for amending SPCC plans by the owners/operators of a facility are specified under the "Oil Pollution Prevention" regulations of 40 CFR Part 112.

The WIPP SPCC Plan undergoes an annual review and is revised as needed to reflect changes in facility activities and emergency equipment.

7.2.3 Notification of Discharge of a Reportable Quantity, 40 CFR §117.21

Any discharge of a designated hazardous substance in quantities equal to or exceeding in any 24-hour period the RQ shall immediately be reported to the appropriate agency of the United States Government.

During this reporting period there were no releases exceeding the RQ of any designated hazardous substance.

7.2.4 NPDES Permit Requirement, 40 CFR §122.1(b)(1)

The NPDES program requires permits for the discharge of pollutants from any point source into waters of the United States.

There are no point-source discharges into navigable water from WIPP. The facility is not required to obtain an NPDES permit.

7.2.5 NPDES Permit Assessment, 40 CFR §122.21(c)(2)

Any "treatment works treating domestic sewage" commencing operations after the promulgation of an applicable standard for sewage sludge use or disposal shall submit an application to the director at least 180 days prior to the date proposed for commencing operations.

The WIPP stabilization sewage lagoon began operating in June 1985. Sludge was disposed of in 1993 during the facility expansion. This expansion included the construction of two new, lined evaporation ponds and the subsequent draining and lining of the primary evaporation pond. All sludges were removed from the primary evaporation pond prior to the installation of the synthetic liner. This was the first removal of sludge in the nine-year operation of the facility, and it is anticipated that sludge removal will be necessary approximately twice prior to final facility closure.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Consultation with the NMED Surface Water Bureau and the EPA Region VI Water Management Division provided a determination for land disposal of the sewage sludges. Dried sludges were removed from the primary evaporation pond and mixed with top soils at a reclamation site near the construction landfill. Sludges were used as a soil additive.

7.2.6 Requirement for NPDES Permit for Storm Water Discharges, 40 CFR §122.26(a)

Storm water discharges are regulated by the EPA under the NPDES program. The EPA requires an NPDES permit for facilities that could discharge contaminated storm water runoff to waters of the United States.

The WIPP site was regulated by NPDES Storm Water Multi-Sector General Permit No. NMR05A225 until a Notice of Termination was submitted on January 7, 2002. Permit coverage was terminated as of midnight, January 9, 2002.

7.3 Compliance Status of Permit Conditions

Specific conditions and their compliance status under the EPA's *Final NPDES General Permits for Storm Water Discharges Associated with Industrial Activity* were published in the *Federal Register* on September 9, 1992 (DOE, 1992a). All applicable requirements are specified in Part IV and Appendix B of the NPDES General Permits.

7.3.1 Notice of Termination, IV(A)(4)

A facility may submit a Notice of Termination if no storm water discharges will be released.

The CBFO and its MOC have implemented best management practices that are designed to make WIPP a zero-discharge facility. The CBFO has demonstrated that the storm water discharges at WIPP can be contained effectively. A Notice of Termination was submitted on January 7, 2002. Permit coverage was terminated as of midnight, January 9, 2002.

7.3.2 Prohibition on Non-Storm Water Discharges, IV(B)(1) and Appendix B, III(A)

The EPA prohibits the release of non-storm water discharges under the storm water discharge NPDES permit.

All non-storm water discharges at WIPP are either air conditioner condensate discharges or fire water testing discharges, both of which are exempt from general permit rules. Air compressor condensate discharges are collected, characterized, and disposed of in accordance with applicable regulations.

7.3.3 Releases of Reportable Quantities of Hazardous Substances and Oil, IV(B)(2) and Appendix B, III(B)

Releases of reportable quantities of hazardous substances and oil must be reported.

There were no spills exceeding an RQ during this reporting period.

8.0 SAFE DRINKING WATER ACT

8.1 Summary of the Law

The SDWA of 1974 (42 U.S.C. §§300f et seq.), as amended, provides the regulatory strategy for protecting public water supply systems and underground sources of drinking water. As defined in the implementing regulations in 40 CFR Part 141, "National Primary Drinking Water Regulations," these systems provide water for human consumption, have at least 15 connections, or regularly serve at least 25 people.

The SDWA also protects underground sources of drinking water from underground injection of contaminated fluids. Underground injection, defined as "subsurface emplacements of fluids by well injections" in §1421(d) of the SDWA, is governed by the Underground Injection Control program described in Subpart C of 40 CFR Part 144.

The EPA delegated authority for ensuring compliance with the SDWA's National Primary Drinking Water Standards by approving the NMED's Drinking Water Regulations (DWRs). These regulations now occupy 20.7.1 NMAC. (See Chapter 30.0, New Mexico Drinking Water Regulations, herein.)

8.2 Compliance Status of the Regulatory Requirements

The WIPP LWA specifically requires compliance with the SDWA.

The NMED has authority to administer the SDWA in New Mexico. The state compliance criteria and general operating requirements for owners and operators of water supply systems are described in 20.7.1 NMAC. These regulations and the compliance status at WIPP are covered in Chapter 30.0 herein.

8.2.1 State Program Requirements, 40 CFR §142.3(b)

All applicable requirements in this section are covered in the state program for the SDWA. (See Chapter 30.0 herein.)

8.2.2 Underground Injection Control, 40 CFR Part 144

The EPA has established a number of requirements for facilities that dispose of wastes by means of underground injection.

None of the hazardous waste currently generated at WIPP is injected underground, nor will TRU waste be disposed by underground injection at WIPP. The EPA's requirements for Underground Injection Control do not apply to WIPP.

9.0 TOXIC SUBSTANCES CONTROL ACT

9.1 Summary of the Law

The TSCA (15 U.S.C. §§2601 et seq.) regulates the production, use, distribution, and disposal of new, potentially toxic chemical substances. The TSCA requires that tests be conducted on new chemical substances so that risks can be understood and addressed before the chemical substances are released into commerce.

The act applies primarily to commercial manufacturers, importers, and processors of toxic chemicals. WIPP is not a manufacturer or a processor of chemical products; therefore, most of the provisions of TSCA do not apply. However, three sections of this act pertain to existing commercial toxic substances, rather than to the development of new chemicals. These sections deal with asbestos, indoor radon abatement, and polychlorinated biphenyls (PCBs).

9.1.1 Asbestos Hazard Emergency Response Act of 1986

Because of the potential for serious health hazards associated with asbestos, Congress amended TSCA in 1986 by adding Title II, the *Asbestos Hazard Emergency Response Act* (AHERA). The AHERA requires the EPA to establish a comprehensive regulatory framework of inspection, management, planning, operations and maintenance activities, and appropriate abatement responses for controlling asbestos-containing materials in schools. Under AHERA, the EPA promulgated its "AHERA-in-Schools Rule" on October 17, 1987. The 1988 AHERA amendments provided additional time for local educational agencies to submit asbestos management plans to the state governors and begin implementation of these plans.

Under AHERA, the EPA was also required to conduct a study to determine the extent of danger to human health posed by asbestos in public and commercial buildings and the means to respond to such danger. This study has been submitted to Congress. At the present time, the act does not require a regulatory program modeled on AHERA for public and commercial buildings.

9.1.2 Indoor Radon Abatement

The Title III TSCA amendment, *Indoor Radon Abatement*, was added to address the national long-term goal "with respect to radon levels in buildings, that the air within the

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

buildings in the United States should be as free of radon as the ambient air outside of buildings." One of the goal-driven requirements that Title III sets forth in §2669, "Study of Radon in Federal Buildings," directs each federal department or agency that owns a federal building to conduct a study to determine the extent of radon contamination in such buildings. The DOE responded to this requirement through *Results of the U.S. Department of Energy Indoor Radon Study* (DOE, 1990c).

9.1.3 Polychlorinated Biphenyls

Section 6(e) of TSCA, *Polychlorinated Biphenyls*, directed the EPA to phase out PCB manufacture and use according to a mandated timetable. This timetable directed the EPA to promulgate rules for the disposal and marking of PCBs within six months of the enactment of TSCA: by one year after the passage of this act, no one was allowed to manufacture, process, distribute, or use any PCBs in the United States except in "a totally enclosed manner." Unless the EPA did not find any unreasonable risk of injury to public health or the environment, no one was allowed to manufacture PCBs at all after two years, or to distribute them after two and one-half years after TSCA's passage.

The regulations at 40 CFR Part 761, "Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," implement the PCB provisions of TSCA. This part applies to all parties who manufacture, process, distribute in commerce, use, or dispose of PCBs or PCB items. The purpose of these regulations is to establish prohibitions of, and requirements for, the manufacture, processing, distribution in commerce, use, disposal, storage, and marking of PCBs and PCB items. DOE policy now prohibits the use of PCB items or equipment in DOE-installed equipment at facilities such as WIPP. Prior to the enactment of TSCA prohibiting PCBs, these chemicals were used in fluids of electrical systems across the country, including DOE sites. Surveys were done at DOE sites to identify any PCBs or PCB-containing equipment and to eliminate the fluids and equipment in accordance with EPA standards.

The applicable PCB storage and disposal regulations are listed at 40 CFR §761.60, "Disposal Requirements," and 40 CFR §761.65, "Storage for Disposal." An Initial Report requesting authorization to store and dispose of TRU and TRU mixed waste contaminated with PCBs, in accordance with the chemical waste landfill provisions of 40 CFR §761.75, was submitted to EPA Region VI on March 22, 2002. The CBFO and the MOC requested waivers from certain requirements of 40 CFR §761.785(b). The requested waivers concern the technical requirements for hydrological conditions, surface and groundwater monitoring, and leachate collection.

9.2 Compliance Status of the Regulatory Requirements

The text provides more detail on the compliance status of each requirement.

9.2.1 Study of Radon in Federal Buildings, TSCA, §309

Each federal agency that owns a building must conduct a study of radon contamination in the building(s).

The DOE conducted an indoor radon study in response to this requirement and submitted the findings in *Results of the U.S. Department of Energy Indoor Radon Study* (DOE, 1990). Radon concentrations measured were less than 1.0 pCi/l. These concentrations are below the 4 pCi/l level at which the EPA recommends further testing of indoor radon.

9.2.2 Prohibition of PCBs, 40 CFR §761.20

No person may use any PCB or any PCB item regardless of concentration in any way other than in a totally enclosed manner within the United States.

The DOE has conducted surveys of electrical equipment, such as transformers, that could house PCB-containing fluids. Any equipment containing PCBs was identified and replaced by non-PCB-containing equipment. All PCB-containing equipment identified was disposed of in accordance with 40 CFR §761.60.

9.2.3 Disposal Requirements for PCBs, 40 CFR §761.60

In most circumstances, PCBs must be incinerated as required by 40 CFR §761.70 or placed in chemical-waste landfills that meet the requirements of 40 CFR §761.75 and that have been approved as a landfill for PCBs by the EPA.

Any equipment identified at WIPP that contained PCB fluids was disposed of as required at off-site facilities.

The DOE has identified TRU and TRU mixed waste streams containing PCBs at generator sites. The WIPP HWFP currently prohibits PCB-regulated wastes greater than or equal to 50 ppm. The CBFO has been working with EPA Region VI to develop a disposal authorization. If this authorization and the impending HWFP modification are approved, some PCB-containing TRU wastes will be disposed of at WIPP in a manner protective of human health and the environment.

10.0 FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

10.1 Summary of the Law

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. §§136 et seq.) authorizes the EPA to regulate the registration, certification, use, storage, disposal, transportation, and recall of pesticides. Section 18 of FIFRA authorizes the EPA to exempt state and federal agencies from any provision of the act if emergency conditions requiring an exemption were determined to exist. *Exemption of Federal and State Agencies for Use of Pesticides under Emergency Conditions* provides guidelines for urgent, nonroutine situations that require the use of pesticides and for which exemptions may be authorized. Sections 19(a) and 25(a) of FIFRA authorize the EPA to establish regulations and procedures regarding the disposal or storage of packages and containers of pesticides and the disposal or storage of excess amounts of such pesticides. FIFRA provides for *Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticides Containers*, established procedures for the acceptance, disposal, or storage of packages and containers of pesticides, and for the disposal or storage of excess amounts of such pesticides. The standards of FIFRA are considered mandatory for DOE facilities. All uses and applications of restricted-use pesticides at WIPP are conducted only by commercial pesticide applicators who are under contract with the MOC and are required to meet federal and state standards. (See also Chapter 37.0, New Mexico Pesticide Control Act, herein.)

10.2 Compliance Status of the Regulatory Requirements

The two major requirements of FIFRA and the compliance status of each are summarized in the text.

10.2.1 Registration of Pesticide Products, 40 CFR §152.15

No person may distribute or sell any pesticide product that is not registered under FIFRA. The pesticide must be registered if the person who distributes or sells the substance knows that it will be used as a pesticide.

Restricted-use pesticides are neither stored at WIPP, nor are they applied by WIPP personnel. All applications of restricted-use pesticides are conducted according to existing contract(s) negotiated with licensed pesticide applicators. The MOC safety and regulatory compliance personnel review all pesticide application contracts before they are awarded. The CBFO requires that any pesticide contractor be licensed with the state as a certified pesticide applicator and submit a list of pesticides used and their respective EPA numbers to the MOC prior to awarding the contract. The current agreement requires that the applicator perform scheduled periodic applications and respond to unscheduled "special situations" such as occurrences of wasp swarming and ant infestation. The contractor submits information consisting of the application date, method of application, the generic pesticide name in the contract. The MOC confirms

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

that adequate protective equipment is available and that the pesticides to be used are not on the EPA restricted-pesticide list. After the application, the contractor must submit such information to the MOC as the type and amount of pesticide used and the dilution factor.

General-use wasp and hornet pesticides used on-site by WIPP personnel are properly registered with the state of New Mexico.

10.2.2 Storage and Disposal of Pesticides and Containers, 40 CFR §156.10

The directions for use shall include specific directions for the storage and disposal of pesticides and their containers.

The general-use wasp and hornet pesticides are stored according to label instructions. Used, empty cans are discarded by WIPP personnel into Satellite Accumulation Area (SAA) containers and managed as hazardous waste.

Because WIPP personnel do not use, store, or dispose of restricted-use pesticides on-site, the majority of these requirements are not applicable. All restricted-use pesticide applications are made by licensed contractors, who are responsible for storing and disposing of pesticides off-site.

The WIPP site is inspected periodically by the New Mexico Department of Agriculture, Division of Agriculture and Environmental Services Bureau of Pesticide Management. The purpose of an inspection is to determine compliance with FIFRA, as amended, and/or the New Mexico Pesticide Control Act. The inspection may include an overview of the site warehouse, where consumer product pesticides are stored, and records pertaining to pesticides applied by the site pest control subcontractor. There were no inspections during the reporting period.

Applications of restricted-use pesticides at WIPP are performed by commercial, state-licensed applicators. The DOE requires applicators under contract to comply with the requirements of the New Mexico Pesticide Control Act and the implementing regulations set forth by the New Mexico State University Board of Regents. More information on the state requirements is provided in Chapter 37.0 herein.

11.0 NOISE CONTROL ACT OF 1972

11.1 Summary of the Law

In the Noise Control Act of 1972 (42 U.S.C. §§4901 et seq.), the EPA declared its policy of promoting an environment for all Americans that is free from noise that jeopardizes public health or welfare. According to the act's policy clause in §2(a)(3), the primary responsibility for noise control is vested in state and local governments. Federal regulation is deemed essential only for commercial noise sources requiring national uniformity of treatment (e.g., aircraft noise). Federal agencies are directed to carry out the programs within their control in a manner that furthers the act's policy. Section 4 of

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

the act states, "each agency having jurisdiction over any property or facility, or engaged in any activity resulting or which may result in the emission of noise, shall comply with federal, state, interstate, and local requirements regarding the control and abatement of environmental noise to the fullest extent consistent with their authority." Facilities under the DOE are required to comply with the Occupational Safety and Health Administration regulations that address occupational noise exposure standards under 29 CFR Part 1910, "Occupational Safety and Health Standards."

The regulations under 29 CFR §1910.95, "Occupational Noise Exposure," define the permissible noise exposure levels to which employees may be subjected. The regulations also include requirements for the development and implementation of a monitoring program, the establishment and maintenance of an audiometric testing program, the measurement of noise, the provision of personal hearing protection equipment when necessary, and the administration of a hearing conservation program.

11.2 Compliance Status of the Regulatory Requirement

The following summarizes the applicable requirement and its compliance status.

11.2.1 Compliance With Hearing Protection Standards, 29 CFR §1910.95

Employers must take measures to protect the hearing of employees.

The DOE administers a full program in accordance with the Noise Control Act and its implementing regulations, and the occupational noise exposure regulations of the Occupational Safety and Health Act. Program activities include the following: a hearing conservation program, an audiometric testing program, administrative and engineering controls, noise measurement (e.g., sound meters, dosimetry), and the provision of personal hearing protection equipment (e.g., ear plugs, ear muffs). The DOE maintains a contract with a certified occupational medicine or health physician, requires hearing protection training for WIPP employees, and developed procedures such as the Hearing Conservation Program. The WIPP industrial hygiene program safety manual and the occupational health manual and their implementing procedures address the requirements and activities conducted under this program.

12.0 NATIONAL ENVIRONMENTAL POLICY ACT

12.1 Summary of the Law

The National Environmental Policy Act (NEPA) (42 U.S.C. §§4321 et seq.) is a comprehensive legislative policy statement on protection of the environment. NEPA requires that the federal government consider potential environmental impacts as part of the decision-making process prior to the initiation of new projects and activities. NEPA provides that the public should be allowed to review and comment on proposed projects with the potential to significantly affect the environment.

12.2 Compliance Status of the Regulatory Requirements

12.2.1 Provision of Environmental Information to Public Officials and Private Citizens, 40 CFR Parts 1500 Through 1508

Environmental information must be made available to the public before decisions are made and actions are taken and must include a detailed statement on environmental impacts of major federal actions significantly affecting the quality of the human environment.

The NEPA created the Council on Environmental Quality (CEQ). The CEQ, contained within the Executive Branch of the government, is the agency charged by Congress to advise the President and to review federal programs in light of national environmental policy. The CEQ's regulations at 40 CFR Parts 1500 through 1508 implement NEPA §102(2). These regulations outline specific requirements for the early integration of the NEPA process, the preparation of environmental impact statements (EISs) or environmental assessments (EAs), public review and solicitation of comments on EISs, decisions with respect to an EIS or EA, and implementation of the decisions. The NEPA regulations also instruct federal agencies to interpret and administer their own specific directives (such as regulations, plans, or orders) to implement the CEQ NEPA regulations within their agency. General directives to federal agencies include considering the impacts of actions in decisions, providing necessary data for decisions, informing the public, and soliciting public input in the decision process.

12.3 U.S. Department of Energy Compliance With NEPA

12.3.1 Summary of the Regulations

Pursuant to 40 CFR §1507.3, the DOE codified its own NEPA regulations at 10 CFR Part 1021, "National Environmental Policy Act Implementing Procedures." The DOE NEPA regulations adopt, and express the DOE's policy to, comply with the CEQ regulations. The DOE regulations were amended on July 9, 1996, to make the implementation of NEPA more efficient and effective. Subpart D of the DOE NEPA regulations was further modified on December 6, 1996, to revise and expand its listing of typical classes of action in Appendices A through D.

The DOE NEPA regulations detail requirements for the preparation and circulation of NEPA documents, including EISs, supplemental EISs, RODs, Mitigation Action Plans (MAPs), and EAs. The DOE requires that a MAP be prepared for the implementation of any commitments made in an ROD for mitigation of environmental impacts associated with an action. A MAP is also required before the DOE issues a Finding of No Significant Impact (FONSI) containing commitments to mitigation measures that are essential to render the impacts of the proposed action "not significant."

Subpart D of 10 CFR Part 1021 lists typical types of actions that require NEPA documentation and those which are typically categorically excluded from the need to

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

prepare an EIS or an EA. Classes of actions that the DOE has determined do not individually or cumulatively have a significant effect on the human environment are *categorical exclusions*. The classes of actions identified in Subpart D are (1) "Categorical Exclusions Applicable to General Agency Actions," such as routine administrative actions; (2) "Categorical Exclusions Applicable to Specific Agency Actions," such as installation of data-processing equipment; (3) "Classes of Actions That Normally Require EAs but Not Necessarily EISs," such as field demonstration projects for wetlands mitigation; and (4) "Classes of Actions That Normally Require EISs," such as the siting, construction, and operation of a facility such as WIPP.

The DOE issues various types of directives (e.g., orders and policy statements) to establish or change policies, organizations, methods, standards, or procedures. The DOE has issued DOE Order 451.1B, *National Environmental Policy Act Compliance Program*, as well as regulations and guidelines contained within 10 CFR Part 1021, to ensure efficient and effective implementation of the DOE's NEPA responsibilities through teamwork. The DOE provides periodic revisions and supplements to its guidance and orders.

12.3.2 Implementing DOE's NEPA Regulations at WIPP, 10 CFR Part 1021

The DOE's regulations implement NEPA (10 CFR Part 1021) and supplement and clarify the requirements contained in 40 CFR Parts 1500 through 1508. The DOE regulations add a requirement for Mitigation Action Plans and Supplement Analyses. They also delineate specific categorical exclusions for DOE facility operations.

Pursuant to the requirements of NEPA, the DOE published the FEIS for WIPP in 1980 (DOE, 1980). The FEIS analyzed and compared the environmental impacts of various alternatives for demonstrating the safe disposal of TRU waste resulting from national defense activities.

Based on the environmental analyses in the FEIS, the DOE published a ROD to the FEIS in 1981 to proceed with the phased development of the WIPP facility (DOE, 1981). This ROD noted that the FEIS would be supplemented, as appropriate, if new environmental data resulted from the site and preliminary design validation program or from other WIPP activities. A number of mitigation commitments were specified in the ROD.

Changes addressed in the 1990 *Final Supplement Environmental Impact Statement* (SEIS) (DOE, 1990a) included alterations in the composition of the waste inventory, the transportation of waste to WIPP, conducting a test phase at WIPP, and management of mixed waste (TRU waste with hazardous constituents). The DOE published a ROD to the SEIS in 1990 (DOE, 1990b).

The DOE issued the *Mitigation Action Plan for the Records of Decision for the Waste Isolation Pilot Plant* (DOE/WIPP 91-030) on July 10, 1991. This document addresses

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

the mitigative commitments stated in the RODs to the 1980 FEIS and the 1990 SEIS and discusses mitigative actions, organizations responsible for implementing these actions, and the status of each commitment. No new mitigation commitments were identified in the ROD for the SEIS-II. The Annual Mitigation Report is prepared to track the status of each commitment not yet closed. To date, eleven Annual Mitigation Reports have been issued.

In October 1993, the DOE decided not to conduct the full range of test phase experiments at WIPP and moved toward the implementation of waste disposal operations. This was based on a determination that TRU waste experiments could be adequately performed at a lower cost in aboveground laboratories as part of the ongoing experimental program. However, a commitment had been made in the SEIS-I ROD to prepare a second SEIS (SEIS-II) prior to beginning disposal operations at WIPP.

In addition to the DOE's 1990 ROD commitment to prepare the SEIS-II, regulatory and statutory changes, as well as changes in the TRU waste inventory and waste acceptance criteria, had occurred since the SEIS-I was issued. New hydrologic and geologic information was used in the development of the WIPP performance assessment and the evaluation of the facility's ability to isolate waste. All these factors formed the basis for the SEIS-II.

On August 23, 1995, the DOE issued a Notice of Intent to prepare the SEIS-II. The major changed circumstances that were analyzed in the SEIS-II were the identification of additional TRU waste generator sites, changes in TRU waste volumes and waste forms, and changes in the compliance status of previously disposed TRU wastes. Other major changes discussed in the SEIS-II include the passage of the amended WIPP LWA, the acquisition of new data from experimental programs, the issuance of the DOE's Final Waste Management Programmatic Environmental Impact Statement (WM PEIS), changes in the Planning Basis Waste Acceptance Criteria, and changes in regulations applicable to WIPP.

In September 1997, the DOE published the SEIS-II (DOE/EIS-0026-S-2, Volumes 1 through 3). The SEIS-II takes into account all of the changing circumstances since 1990 that might result in potential environmental impacts from WIPP disposal and closure operations.

On January 16, 1998, the DOE issued the ROD for the SEIS-II (DOE, 1998a). The SEIS-II ROD was prepared in coordination with the DOE's WM PEIS ROD for TRU waste. The SEIS-II ROD describes the DOE's decision to dispose of TRU wastes generated by defense-related activities at WIPP. This decision was based on the DOE's analysis of alternatives described in the SEIS-II. In January 2001, an EA for conducting astrophysics and other basic science experiments at the WIPP site was added to WIPP operations. In March 2001, an Environmental Review to enable WIPP to use Type B Packages was submitted.

12.3.3 Status of Other NEPA Documentation Related to WIPP

Since the issuance of the SEIS-I, the DOE has published four EAs, one draft EA, and three supplement analyses related to WIPP. In 1991, a Supplemental Analyses (SA) was prepared for proposed waste characterization and packaging activities at the Idaho National Engineering and Environmental Laboratory (INEEL) for the WIPP test program and a second SA evaluated proposed transportation routes to WIPP and the discovery of a deviated gas well at WIPP.

The SA for the INEEL waste characterization and packaging process evaluated the impacts of conducting some of the WIPP waste characterization activities at two locations at the INEEL, instead of one location as described in the SEIS-I (DOE/EIS-0026-FS/SA1). The activities analyzed three actions, including the certification and storage of CH TRU waste at the existing Radioactive Waste Management Complex, the characterization and repackaging of these wastes into bins or 55-gallon drums at the existing Hot Fuel Examination Facility, and the transportation of the wastes along a 26-mile route between the two facilities.

The second SA described the selection of some TRU waste transportation routes and the discovery of a deviated gas well at WIPP (DOE/EIS-0026-FS/SA2). The CBFO determined that these activities did not involve substantial changes to the SEIS-I proposed action and no additional NEPA documentation was required.

On January 23, 1995, the DOE issued an EA and FONSI for the Proposed Actinide Source-Term Test Program at Los Alamos National Laboratory (LANL) (DOE/EA-0977). This EA examined the site-specific impacts of conducting tests at LANL as part of the WIPP experimental program.

On May 19, 1995, the DOE adopted an EA and a FONSI issued by the Bureau of Land Management (BLM) that addressed potential impacts of the construction and operation of the Sand Dunes to Ochoa Power Line Project and a new WIPP substation (DOE/EA-1109). The BLM prepared the EA since the construction of the power line took place on BLM-owned land; the DOE was a cooperating agency.

On October 10, 1995, the DOE issued an EA and a FONSI for the impacts associated with the construction and operation of the Carlsbad Environmental Monitoring and Research Center (DOE/EA-1081). The center independently monitors environmental impacts for ongoing and future WIPP operations as part of its aim to improve environmental monitoring techniques.

In December 2000, the DOE issued a supplement analysis (DOE/EIS-0200-SA-01) for the proposal to do confirmatory waste characterization at WIPP. Based on the supplement analysis, the DOE revised the Record of Decision for the treatment and storage of TRU waste to allow confirmatory waste characterization at WIPP, contingent on receipt of the required regulatory approvals.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

On January 29, 2001, the DOE issued an EA and a FONSI for the proposal to conduct astrophysics and other basic science experiments at the WIPP site (DOE/EA-1340). The experiments would be conducted primarily in the WIPP underground, where the low background radiation would enhance the ability of detectors to identify some of the basic particles that are believed to make up the universe.

In March 2002, the DOE issued a draft EA (DOE/EA-1404) for the proposal to construct an actinide chemistry and repository science laboratory in Carlsbad to support the WIPP program. Public comments are being evaluated for that EA and no action has yet been taken on that proposal.

12.3.4 Operational Compliance With NEPA at WIPP

Day-to-day operational compliance with NEPA at WIPP is achieved through implementation of the CBFO/MOC National Environmental Policy Act Compliance Plan and the WIPP NEPA compliance procedure. These documents describe the roles and responsibilities of both the CBFO NEPA Compliance Officer and the MOC NEPA Coordinator to evaluate the impacts of proposed projects at the site. Activities that have undergone NEPA review are tracked on the NEPA Compliance Database. The NEPA compliance procedure also establishes a program to screen proposed actions against existing NEPA documents to determine whether such actions are within the scope of existing WIPP programmatic NEPA documentation. The initial screening of proposed actions is completed by the MOC NEPA Coordinator. The CBFO NEPA Compliance Officer is responsible for making the final determination whether proposed actions are outside the scope of existing documentation, and makes a determination whether the proposed action is categorically excluded. If the action is not covered by WIPP programmatic NEPA documentation and is not categorically excluded, the CBFO NEPA Compliance Officer submits a recommendation to the appropriate official as delineated by DOE Order 451.1B regarding the need to prepare a Supplemental Analysis, EA, or EIS to address the proposed action.

13.0 ATOMIC ENERGY ACT AND THE U.S. DEPARTMENT OF ENERGY

13.1 Summary of the Law

The AEA of 1954 as amended (42 U.S.C. §§2011 et seq.) established a national program for research, development, and use of atomic energy for national defense and civilian purposes. Section 161 of the AEA authorized the Atomic Energy Commission to establish rules, regulations, and orders to govern any activity regulated under the AEA to protect health and minimize hazards to life or property. Activities included standards and restrictions pertaining to the design, location, and operation of facilities.

The Atomic Energy Commission has been succeeded by three organizations: the Energy Research and Development Administration and the DOE for national defense, and the NRC for domestic civilian purposes (see Chapter 14.0, Atomic Energy Act and the U.S. Nuclear Regulatory Commission, herein for the compliance status of NRC-related requirements). The AEA and subsequent reorganization acts gave the DOE its

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

authority to develop policies, issue orders, and promulgate regulations that address environmental, safety, and health protection aspects of radioactive waste and nuclear materials. Limits on radioactivity levels in TRU¹ waste to be disposed of at WIPP are set in Section 7 of the WIPP LWA. The radioactive constituents of the TRU waste to be shipped to WIPP are regulated under the AEA by the DOE. This is done by a system of orders, notices, directives, and policies that carry out the AEA mandate to implement effective and consistent programs to protect the public, the environment, and workers from adverse consequences from DOE operations.

13.2 Compliance Status With the Regulatory Requirements

As indicated in the previous section, the DOE uses a system of orders, notices, directives, and policies to implement its programs under the AEA and to ensure compliance with the requirements of the AEA. An assessment process is in place to assure compliance with environmental safety and health related orders. The compliance status for each of the DOE orders that are relevant to the management of TRU waste at WIPP are noted.

13.2.1 DOE Order 151.1A, *Comprehensive Emergency Management System*

This order establishes requirements for emergency planning, categorization, preparedness, response, notification, public protection, and readiness assurance activities. The applicable requirements of this order are implemented through the WIPP emergency management program, the emergency response program, the training program, the emergency readiness program, the records management program, and the RCRA Contingency Plan (Attachment F of the HWFP).

13.2.2 DOE Order 225.1A, *Accident Investigation*

The objective of this order is to prescribe requirements for conducting investigations of certain accidents occurring at DOE operations and sites; prevent the recurrence of such accidents; and contribute to improved environmental protection and safety and health of DOE employees, contractors, and the public. This order is implemented through the Root Cause Analysis procedure.

¹The AEA defined "transuranic waste" as

. . . material contaminated with elements that have an atomic number greater than 92, including neptunium, plutonium, americium, and curium, and that are in concentrations greater than 10 nanocuries per gram, or in such other concentrations as the Nuclear Regulatory Commission may prescribe to protect the public health and safety (AEA, §11[ee]).

TRU waste was redefined in the LWA as waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years. Wastes with concentrations of radioactivity that are less than 100 nanocuries per gram of waste are classified as low-level waste.

13.2.3 DOE Order 231.1, *Environment, Safety and Health Reporting*

The objective of this order is to ensure collection and reporting of information on environment, safety and health that is required by law or regulation to be collected, or that is essential for evaluating DOE operations and identifying opportunities for improvement needed for planning purposes within the DOE. The order specifies the reports that must be filed, the persons or organizations responsible for filing the reports, the recipients of the reports, the format in which the reports must be prepared, and the schedule for filing the reports. The order was approved on September 30, 1985, and is implemented at WIPP through the environmental monitoring plan, the annual site environmental report, the hazardous and universal waste management plan, the HWFP reporting and notifications compliance plan, the radiation safety manual, the dosimetry program, the fire protection program, and MOC procedures.

13.2.4 DOE Order 232.1A, *Occurrence Reporting and Processing of Operations Information*

This order is to establish and maintain a system for reporting operations information related to DOE-owned and DOE-leased facilities, in order to identify the root causes of unusual, off-normal and emergency occurrences and to provide for appropriate corrective action. This order is implemented through the WIPP emergency management program, the hazardous materials plan, the radiation safety manual, the fire protection program, the exposure control plan, and MOC procedures.

13.2.5 DOE Order 414.1A, *Quality Assurance*

This order provides DOE policy, sets forth principles, and assigns responsibilities for establishing, implementing, and maintaining programs, plans, and actions to ensure quality achievement in DOE programs. This order is fully implemented through the MOC and CBFO QA programs.

13.2.6 DOE Order 420.1A, *Facility Safety*

This order specifies requirements for nuclear safety, criticality safety, fire protection, and natural phenomena hazards mitigation. The requirements are implemented through the WIPP SAR.

13.2.7 DOE Order 435.1, *Radioactive Waste Management*

The objective of this order is to ensure that all DOE radioactive waste is managed in a manner that is protective of workers and the public. In the event that a conflict exists between any requirements of this order and the LWA regarding their application to WIPP, the requirements of the LWA will prevail.

13.2.8 DOE Order 440.1A, *Worker Protection Management for DOE Federal Contractor Employees*

This order establishes the framework for a worker protection program that will reduce or prevent injuries, illnesses, and accidental losses by providing DOE federal and contractor workers with a safe and healthful workplace. The MOC implementing documents are the radiation safety manual, the industrial safety program, the industrial hygiene program, the fire protection program, the occupational health program plan, and MOC procedures.

13.2.9 DOE Order 451.1B, *National Environmental Policy Act Compliance Program*

This order is implemented by the CBFO and the MOC for site activities covered in the NEPA Compliance Plan. Further discussion of this requirement can be found in Chapter 12.0, National Environmental Policy Act, herein. This order replaced DOE Order 451.1A, which, in turn, replaced DOE Order 5440.1E.

13.2.10 DOE Order 460.1A, *Packaging and Transportation Safety*

This order establishes requirements for the packaging and transportation of hazardous materials, hazardous substances, and hazardous wastes. Requirements for portions of this order are addressed in the TRUPACT-II SAR (DOE, 1999b) and the TRUPACT-II Certificate of Compliance (C of C) No. 9218, and are implemented through the MOC transportation program.

13.2.11 DOE Order 460.2, *Departmental Materials Transportation and Packaging Management*

This order establishes DOE policies and requirements for materials transportation and packaging operations including traffic management, for other than intrabuilding and intrasite transfers. This order also establishes administrative procedures for the certification and use of radioactive and other hazardous materials packaging by the DOE. Requirements of the order are contained in the TRUPACT-II SAR and the TRUPACT-II C of C. The order is implemented through the MOC transportation program.

13.2.12 DOE Order 5400.1, *General Environmental Protection Program*

This order, along with portions of Order 231.1, establishes environmental protection program requirements, authorities, and responsibilities for DOE operations for assuring compliance with federal, state, and local environmental protection laws and regulations, executive orders, and internal DOE policies. In addition to MOC procedures, this order is implemented through the groundwater monitoring program, the meteorological QA plan, the environmental monitoring plan, and the annual site environmental report.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

As an ongoing activity, the MOC's engineering function has been gathering information concerning water infiltration around the exhaust shaft. This information is located in the Geotechnical Analysis Report for July 1998 - June 1999 (DOE, 2000).

13.2.13 DOE Order 5400.5, *Radiation Protection of the Public and the Environment*

This order, along with portions of Order 231.1, establishes standards and requirements for operations of the DOE and its contractors with respect to protecting members of the public and the environment against undue risk from radiation. Activities and analyses describing compliance with the applicable requirements of this order are cited in the WIPP SAR. Monitoring activities to document compliance with the order are described in the WIPP ALARA [as low as reasonably achievable] program manual, the environmental monitoring plan, the records management program, and the radiation safety manual.

13.2.14 DOE Order 5480.4, *Environmental Protection, Safety and Health Protection Standards (portions)*

This order specifies and provides requirements for the application of the mandatory environmental protection, safety, and health standards applicable to all DOE and contractor operations, contains a listing of those standards, and identifies the sources of the mandatory and reference standards. The standards are implemented through the RCRA Contingency Plan; the MOC transportation program, and the hazardous waste management plan. Portions of this order have been replaced by DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*.

13.3 Other Regulations - 10 CFR Part 830 Series

The DOE has issued other regulations in the 10 CFR series that are intended to protect public health, safety, and the environment. On December 14, 1993, the DOE published 10 CFR Part 835, "Occupational Radiation Protection." These regulations became effective on January 13, 1994. A number of programs are in place at WIPP to meet the requirements of 10 CFR Part 835. These regulations prescribe occupational exposure limits resulting from normal activities for employees.

The DOE published proposed regulations entitled "Radiation Protection of the Public and the Environment" (10 CFR Part 834) in the *Federal Register* on March 25, 1993. These regulations will become applicable to WIPP when they are issued in final form.

The DOE has promulgated additional regulations, 10 CFR Part 830, "Nuclear Safety Management," which were published in the *Federal Register* on April 5, 1994. Amendments to these regulations were published in the *Federal Register* on January 10, 2001.

**13.3.1 Taking Action(s) Inconsistent With the Requirements of
10 CFR Part 830, 10 CFR §830.4(a)**

No person may take or cause to be taken any action inconsistent with the requirements of this part.

The MOC has established a program for identifying, evaluating, and reporting potential noncompliances under the Price-Anderson Amendments Act (PAAA).

**13.3.2 Implementation and Compliance With the Requirements of
10 CFR Part 830, 10 CFR §830.4(b)**

The contractor responsible for a nuclear facility must ensure implementation and compliance with the requirements of this part.

The MOC has implemented and is complying with the requirements of 10 CFR Part 830, Subpart A, in the MOC's QAPD.

**13.3.3 Reasonable Assurance of Adequate Protection of Workers, the Public,
and the Environment, 10 CFR §830.4(c)**

The requirements of this part must be implemented in a manner that provides reasonable assurance of adequate protection of workers, the public, and the environment from adverse consequences, taking into account the work to be performed and the associated hazards.

The requirements of this part are implemented in the MOC's QAPD. The provisions of the QAPD provide the basis used to determine reasonable assurance of adequate protection of workers, the public, and the environment. The MOC has established a graded approach process, which takes work to be performed and associated hazards into account in the implementation of QAPD requirements.

13.3.4 Records to Substantiate Compliance, 10 CFR §830.6

Complete and accurate records will be maintained as needed to substantiate compliance with the requirements of this part.

This rule was finalized on January 10, 2001. The MOC personnel maintain complete and accurate records as necessary to substantiate compliance with the requirements of this part. Record-keeping requirements are described in more detail in the QAPD.

13.3.5 Use of a Graded Approach, 10 CFR §830.7

Where appropriate, a contractor must use a graded approach to implement the requirements of this part, document the basis of

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

the graded approach used, and submit that documentation to the DOE.

Risk factors and the graded approach to QA are discussed in the QAPD. Assignment of a specific quality code to an item or activity is commensurate with the associated risk classification; the resulting levels of control provide effective program management and incorporate due regard for the health and safety of the public and plant personnel, complexity, consequences of failure, environmental impacts, and the safe and reliable operation of WIPP and the TRU transport packaging program.

The MOC has also issued a procedure to implement the graded approach to the application of the criteria described in 10 CFR §830.122. The graded approach to applications of QA controls procedure has been approved by the DOE.

13.3.6 Conduct of Work in Accordance With 10 CFR §830.121(a) and 10 CFR §830.122

The contractor responsible for the DOE nuclear facility must conduct its work in accordance with the criteria described in 10 CFR §830.122.

The MOC developed a QAP as described in the QAPD. Quality-related work is conducted in accordance with the criteria specified in 10 CFR §830.122 and described in the QAPD. The DOE approved the current QAPD March 26, 2002.

13.3.7 Application of the Appropriate QA Criteria in the QAP and Annual Submittal of Substantive Changes in the QAP to the DOE, 10 CFR §830.121(b) and 10 CFR §830.121(c)

The contractor shall develop a QAP and submit it to the DOE. Changes made to the QAP shall be submitted annually to DOE for review. The contractor shall conduct work in accordance with the QAP.

The QAP must describe how the QA criteria of 10 CFR §830.122 are satisfied; integrate the QA criteria with the Safety Management System, or describe how the QA criteria apply to the Safety Management System; use voluntary consensus standards in its development and implementation; and describe how the contractor ensures that subcontractors and suppliers satisfy the QA criteria.

The MOC has developed a QAP as described in the QAPD using the criteria specified in 10 CFR §830.122 (see Subsection 13.3.8). The QAPD includes a discussion of how the criteria of 10 CFR §830.122 are met and how they apply to the Safety Management System. Voluntary consensus standards, such as NQA-1, used to develop and

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

implement the QAPD are referenced in Table 1 of the QAPD, QA Program Source Documents. Subcontractor/supplier controls are discussed in the QAPD.

The QAPD was submitted to the DOE, and the DOE approved it in January 1995. Several substantive changes have been made to the QAPD since that time; each time, the changes were submitted to and approved by the DOE. The DOE approved the current QAPD on March 26, 2002.

The MOC conducts work in accordance with the QAP as described in the QAPD and incorporated into implementing procedures which control the MOC's work.

13.3.8 QA Criteria to Be Included in the QAP, 10 CFR §830.122

The QAP must address management program, personnel training and qualification, quality improvement, documents, and records criteria. The QAP also must address performance (i.e., work processes, design, procurement, inspection, and acceptance testing) and assessment (i.e., management assessment and independent assessment criteria).

The MOC developed and implemented the QAPD to address the QA criteria of 10 CFR §830.122. The management program is described in the QAPD. The organization structure, functional responsibilities and authorities, interfaces, and planning considerations are described in the QAPD.

Personnel training and qualifications are described in the QAPD. The QAPD provides for quality improvement and includes a description of the requirements and responsibilities for ensuring that appropriate methods are used to enhance quality, to detect and prevent quality problems, and to take corrective actions when "conditions adverse to quality" have been detected.

Requirements pertaining to documents and records are described in the QAPD. The discussion in the QAPD addresses the preparation, review, and approval of documents, and deals with the generation, classification, indexing, receipt, storage, preservation, disposition, retrieval, and correction of information in quality records.

The Performance Quality Assurance Requirements section of the QAPD encompasses the general area of performance QA requirements. Work processes include work, implementing procedures; item identification and control; special processes; handling, storage, and shipping; and status indicators. The Design Control section presents a discussion of the design control requirements, including design input, process, analyses, interfaces, verification, and change. The Procurement section describes the requirements pertaining to procurement planning, documents, evaluation of supplier performance, and commercial grade items. The Inspection and Testing section provides information pertaining to the requirements and responsibilities for the inspection of items or activities affecting quality to verify conformance to specified

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

criteria. This section also describes requirements and responsibilities for the control of measuring and test equipment.

The Assessment Requirements section is comprised of two subsections: Management Assessment and Independent Assessment. The first subsection describes how managers should assess their management processes and identify, correct, and track problems that impede achievement of the organization's objectives. The second subsection describes how independent assessments are planned and conducted to evaluate compliance with the applicable QA requirements and the implementing procedures, as well as to evaluate the effectiveness of the overall quality program.

The Sample Control and Quality Assurance Requirements section deals with sample control and identification; handling, storing, and shipping samples; disposition of nonconforming samples; environmental data operation samples; and documentation, control, and validation.

The QAPD also addresses QA requirements for software.

This discussion of the organization of the QAPD is based on Revision 22 of this document. The latest revision was approved by the MOC on February 25, 2002; CBFO approval was obtained on March 26, 2002.

13.3.9 Safety Basis, 10 CFR §830.202(a)

The contractor responsible for a hazard category 1, 2, or 3 DOE nuclear facility must establish and maintain the safety basis for the facility.

The MOC has implemented the requirements of 10 CFR §830.202(a) through the WIPP CH SAR.

13.3.10 Unreviewed Safety Question Process, 10 CFR §830.203(a)

The contractor responsible for a hazard category 1, 2, or 3 DOE nuclear facility must establish, implement, and take actions consistent with a USQ process that meets the requirements of this section.

DOE G 424.1-1, Implementation Guide for Use in Addressing Unreviewed Safety Question (USQ) Requirements, provides information to assist in the implementation and interpretation of 10 CFR §830.203. The MOC has implemented the requirements of 10 CFR §830.203 through the USQ procedure.

13.3.11 Documented Safety Analysis, 10 CFR §830.204(a)

The contractor responsible for a hazard category 1, 2, or 3 DOE nuclear facility must obtain approval from DOE for the

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

methodology used to prepare the documented safety analysis for the facility unless the contractor uses a methodology set forth in Table 2 of Appendix A to this part.

DOE G 421.1-2, Implementation Guide for Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR Part 830, elaborates on the documented safety analysis development process and the safe harbor provisions of the Appendix to 10 CFR Part 830, Subpart B. The MOC has implemented the requirements of 10 CFR §830.204 through the WIPP CH SAR.

13.3.12 Technical Safety Requirements, 10 CFR §830.205(a)

The contractor responsible for a hazard category 1, 2, or 3 DOE nuclear facility must (1) Develop technical safety requirements that are derived from the documented safety analysis.

DOE G 423.1-1, Implementation Guide for Use in Developing Technical Safety Requirements," provides elaboration for the content of Technical Safety Requirements (TSRs). The MOC has implemented the requirements of 10 CFR §830.205 through the WIPP CH TSR, which is published as Attachment 1 to the WIPP CH SAR.

13.3.13 Occupational Dose Limits for General Employees, 10 CFR §835.202(a)

The occupational dose received by general employees shall be controlled such that a total EDE of 5 rem (0.05 sievert), a dose equivalent of 15 rem (0.15 sievert) to the lens of the eye, the sum of the deep dose equivalent for external exposures and the committed dose equivalents to any other organs and tissues of 50 rem (0.5 sievert), and a shallow dose equivalent of 50 rem (0.5 sievert) to the skin or to any extremity shall not be exceeded in a year.

WIPP policy sets control limits to ensure that no MOC workers receive doses that exceed these limits. Personnel dosimetry results to date have shown that no employees have exceeded any radiological dose of concern.

13.4 Nuclear Safety Noncompliance and the Price-Anderson Amendments Act of 1988

Congress passed the Price-Anderson Act in 1957 as an amendment to the AEA of 1954. The purpose of the Price-Anderson Act is threefold: (1) to promote growth and development of nuclear energy through increased private industry participation, (2) to protect the public, and (3) to ensure compensation should a nuclear event occur that damages and/or injures members of the public by providing funds for recovery operations.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The PAAA of 1988 allowed the DOE to impose civil and criminal penalties on its contractors, subcontractors, and employees for violating any nuclear safety rule or order issued by the Secretary of Energy. The DOE has the authority to either reduce or not impose the base civil penalty of up to \$110,000 per violation per day, if the MOC promptly identifies the violation and reports it to the DOE. Conversely, the DOE will not mitigate the base civil penalty if the MOC does not promptly identify and report nuclear safety violations. The MOC uses the Price-Anderson Noncompliance Tracking System (NTS), a centralized data base, to report and track reportable PAAA nuclear safety noncompliance events. Procedures are in place at WIPP to assist personnel in determining and reporting noncompliance issues. During this reporting period, seven NTS Reports were submitted. Four NTS Reports are closed; two are completed and awaiting closure; and one is incomplete. Details are shown in the table below.

REPORT NUMBER	NONCOMPLIANCE	DATE REPORTED	STATUS
NTS-ALO-CAO-WEC-WIPP-2000-0001	Radiological Material Area Entry Noncompliances	5/25/2000	Closed 2/21/2001
NTS-ALO-CAO-WEC-WIPP-2000-0002	Failure to Comply With Review and Approval Requirements for Purchase Requisitions	7/28/2000	Closed 3/11/2002
NTS-ALO-CAO-WEC-WIPP-2000-2003	Failure to Control Acquired Excessed Equipment	12/24/2000	Closed 3/11/2002
NTS-ALO-CAO-WEC-WIPP-2001-0001	Procurement Process Issues	5/14/2001	Closed 3/11/2002
NTS-ALO-CAO-WEC-WIPP-2001-0002	Radiological Work Permit Nonconformances	8/24/2001	Completed
NTS-ALO-CAO-WEC-WIPP-2002-0001	Potential Programmatic Issues in Conduct of Operations	6/27/2002	Incomplete
NTS-ALO-CAO-WEC-WIPP-2002-0002	Unauthorized Entry Into Waste Transit Area	6/3/2002	Completed

14.0 ATOMIC ENERGY ACT AND THE U.S. NUCLEAR REGULATORY COMMISSION

14.1 Summary of the Law

As discussed in Chapter 13.0 herein, the AEA of 1954 as amended (42 U.S.C. §§2011 et seq.) gives the NRC its authority to develop policies, issue orders, and promulgate regulations that address environmental, safety, and health protection aspects of radioactive waste and nuclear materials in the civilian sector. Regulations promulgated by the NRC under the AEA appear in 10 CFR Chapter I and establish standards for the management of nuclear material and the protection of the public against radiation. Additional NRC requirements apply to the licensing, packaging, preparation, and transportation of radioactive materials.

14.2 Compliance Status of the Regulatory Requirements

As intended by the AEA, the DOE is generally exempted from the regulatory authority of the NRC. The only portion of the NRC's implementing regulations that applies to WIPP is 10 CFR Part 71, "Packaging and Transportation of Radioactive Material." These regulations pertain to the NRC's consideration for approval of packagings applications, such as the TRUPACT-II (C of C No. 9218 issued August 30, 1989) and the HalfPACT (C of C No. 9279 issued November 2, 2000), which are designed to transport CH TRU wastes from the generator sites to WIPP. The packagings for transporting RH TRU waste to WIPP are the RH-TRU 72-B Cask (C of C No. 9212 issued March 23, 2000) and the CNS 10-160B Cask (C of C No. 9204 issued February 4, 2000). For purposes of this chapter, the term "packagings" implies the TRUPACT-II, the HalfPACT, the RH-TRU 72-B Cask, and the CNS 10-160B Cask.

14.2.1 General License, 10 CFR §71.12

A general license is not required for WIPP. Each type of packaging to be used to transport either CH or RH TRU waste is required to have a C of C from the NRC.

14.2.2 Contents of Application and Package Description/Evaluation, 10 CFR §§71.31 Through 71.39

The required contents of an application are described. The application must include a package description/evaluation and description of the packaging and proposed contents as described in 10 CFR §71.33 and must demonstrate that the package meets the appropriate NRC standards. In addition, the QA program for the design, fabrication, assembly, testing, maintenance, repair, modification, and use of the package must be described, along with established codes and standards. Any additional information requested by the NRC must be provided.

The applications for the packagings describe the design, specifications, and safety evaluation in accordance with the NRC's requirements. The NRC's reissuance of the current C of Cs confirms that the packagings are in compliance with all applicable requirements of 10 CFR §§71.31 through 71.39.

14.2.3 Demonstration of Compliance, 10 CFR §71.41

The tests specified in 10 CFR §§71.71 and 71.73 must be performed on the package to demonstrate compliance under normal conditions and hypothetical accident conditions, respectively.

The applications describe the analysis and testing to demonstrate compliance with both normal and hypothetical accident conditions of transport. The NRC's reissuance of the

C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §71.41.

14.2.4 Standards for All Packages, 10 CFR §§71.43 and 71.45

Standards for all packages must be met. These include general standards such as size, seals and fastening devices, materials and construction of the package, valves, temperature, and prohibition of continuous venting during transport as well as lifting and tie-down standards.

The applications describe the packaging features, including tie-downs. The NRC's reissuance of the C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §§71.43 and 71.45.

14.2.5 External Radiation Standards for All Packages, 10 CFR §71.47

A package must be designed and prepared for shipment so that the radiation level at any external surface of the package does not exceed 200 mrem per hour and the transport index does not exceed 10.

The applications discuss the fact that the packagings and contents are limited to less than 200 mrem per hour at the surface of the packagings. The NRC's reissuance of the C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §71.47.

14.2.6 Additional Requirements for Type B Packages, 10 CFR §71.51

Type B packages must be designed, constructed, and prepared for shipment so as to prevent loss or dispersal of radioactive material, significant increase in external radiation levels, or substantial reduction in the effectiveness of the packaging during normal transport. In addition, release of krypton-85 may not exceed 10,000 curies in one week, release of other radioactive material may not exceed a total amount A_2 in one week, and no external radiation dose rate may exceed 1 rem per hour at 1 meter from the external surface of the package during hypothetical accident conditions. Compliance with these requirements must not be predicated upon the use of filters or of a mechanical cooling system.

The applications discuss containment design and an acceptance criterion (a leak rate of less than 1×10^{-7} standard cubic centimeters per second). The NRC's reissuance of the C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §71.51.

14.2.7 Requirements for All Fissile Material Packages, 10 CFR §§71.55 Through 71.59

All packages used to ship fissile material must be designed and constructed in accordance with 10 CFR §§71.41 through 71.51. In addition, each package must be designed and constructed and its contents so limited that the contents will remain subcritical during normal and accident transportation conditions and that the packaging will remain effective during normal transportation conditions. Specific standards for fissile material packages are described in 10 CFR §71.59.

The applications discuss criticality; the contents are controlled to limit the amount of fissile material that may be shipped. Fissile classes have been replaced with a Criticality Transport Index. The NRC's reissuance of the C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §§71.55 through 71.61.

This section does not apply to the CNS 10-160B Cask (C of C No. 9204). The authorized contents of the CNS 10-160B Cask are limited to the quantities specified in the C of C. The quantities must meet the Department of Transportation's (DOT) and the NRC's limits for "Fissile Excepted," and be less than 20 curies plutonium.

14.2.8 Special Requirements for Plutonium Shipments, 10 CFR §71.63

Plutonium in excess of 20 curies per package must be shipped as a solid and must be packaged in a separate inner container placed within outer packaging that meets the requirements of 10 CFR §§71.41 through 71.77. In addition, the restrictions limiting plutonium under normal and accident conditions must be met.

The applications for the TRUPACT-II, the HalfPACT, and the RH-TRU 72-B Cask describe the double containment feature of the packagings. The CNS 10-160B Cask is limited and controlled in accordance with the C of C to less than 20 curies of plutonium.

14.2.9 Tests Under Normal Conditions of Transport, 10 CFR §71.71

The behavior of each package design under tests and conditions simulating normal transportation conditions must be evaluated. The tests include thermal insulation for both heated and cold conditions, increased and reduced external pressure, vibration, water spray, free drop, corner drop, compressive loading, and penetration.

The applications describe the analyses and/or tests performed to demonstrate compliance with the normal conditions of transport. The NRC's reissuance of the

C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §71.71.

14.2.10 Tests Under Hypothetical Accident Conditions, 10 CFR §71.73

Evaluation of a package for hypothetical accident conditions is based upon the sequential application of tests in the order specified to determine their cumulative effect on a package or array of packages. Tests include free drop, crush, puncture, thermal, and immersion as specified in 10 CFR §71.73.

The applications describe the analyses and/or tests performed to demonstrate compliance with the hypothetical accident conditions of transport. The NRC's reissuance of the C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §71.73.

14.2.11 Assumptions Regarding Unknown Properties, 10 CFR §71.83

When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other relevant property of fissile material in a package is not known, the fissile material will be packaged as if the unknown properties have credible values that will cause the maximum neutron multiplication.

The applications limit the amount of fissile material that may be shipped in the packagings. The NRC's reissuance of the C of Cs confirms that the packagings continue to meet the applicable requirements of 10 CFR §71.83.

14.2.12 Special Opening Instructions, 10 CFR §71.89

Any special opening instructions must be sent or otherwise made available to the consignee prior to delivery of a package.

The operating and maintenance instructions manual provides instructions for preparation, use, operation, inspection, and maintenance of the packagings. MOC personnel are also responsible for training personnel at the generator sites in these methods and performing assessments and audits to ensure that WIPP-generated methods are being applied correctly at the generator sites.

14.2.13 Reports Regarding Decreased Effectiveness or Defects With Safety Significance, 10 CFR §71.95

Within 30 days, the licensee will report the following to the NRC: (1) any instance in which there was significant reduction in the effectiveness of any authorized packaging during use; (2) details of any defects with safety significance in packaging after first use and the means used to prevent recurrence; and (3) instances in

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

which the conditions of approval in the C of C were not observed in making a shipment.

The packaging maintenance program is defined and detailed in MOC procedures that address such topics as control of material, spare parts, and nonconformance reports. Maintenance records are maintained by the packaging maintenance engineers. No conditions causing decreased effectiveness have occurred to date. An audit of the packaging maintenance program, conducted in March 2000 by the MOC, determined that all the programmatic requirements for maintaining the packagings were being met adequately.

During this reporting period, four notifications were made to the NRC in accordance with the requirements of 10 CFR §71.95. One notification (Brown to U.S. NRC, December 14, 2000) concerned the use of two TRUPACT-II units for waste shipments before the required testing was completed. A second notification (Caviness to Tiktinsky, May 7, 2001) concerned a shipment that did not comply with the C of C requirement that all payload containers be of the same shipping category. A third notification (Caviness to Tiktinsky, March 11, 2002) concerned shipments in which components of the TRUPACT-II units were used in an impaired condition. The fourth notification (Caviness to Tiktinsky, April 1, 2002) concerned a discrepancy between the bar-coded identification numbers on the waste containers and the identification numbers reported in the WWIS. Shipments were suspended until the issue was resolved and measures were implemented to prevent the recurrence. No harm to human health or the environment was caused by these occurrences. Corrective measures have been taken to prevent recurrence of these issues.

14.2.14 Advance Notification of Shipment of Nuclear Waste, 10 CFR §71.97

Advance written notification of a shipment of nuclear waste will be provided to the governor of any state to be traversed by the shipment. Notification must be provided at least seven days or four days before the beginning of the seven-day period during which departure of the shipment is expected if notification is by mail or by messenger, respectively. The information required by 10 CFR §71.97(d) will be provided. It should be noted that a revised list of governors' designees was published in the Federal Register on June 30, 1995 (60 FR 34306). The annually updated list will be published in the Federal Register every year around June 30.

As identified in Section 14.2, this section does not apply to WIPP. However, in cooperation and agreement with the states' organizations (e.g., Western Governors Association), the DOE has agreed to provide written notification of the first five shipments in a corridor fourteen days in advance. Further, the DOE will provide the states an annual notification, with six-month updates, of the shipments planned for the coming year. The states receive the eight-week rolling schedule on a weekly basis. The eight-week rolling schedule provides the detail of the annual plan. State officials

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

designated for receipt information (or their designee) are provided access to TRANSCOM (the DOE's Transportation Tracking and Communication System). Through TRANSCOM, the states can view the eight-week rolling schedule, detailed shipment information (shipment's operational status, the location of the shipment, messages associated with the shipment) and shipment-specific emergency response and contact information.

14.2.15 NRC Quality Assurance Requirements, 10 CFR §§71.101 Through 71.137

Subpart H of 10 CFR Part 71 (§§71.101 through 71.137) established the NRC QA requirements for packagings. The QA requirements pertain to design, purchase, fabrication, handling, shipping, storage, cleaning, assembly, inspections, testing, operation, maintenance, repair, and modification of components of packaging that are important for safety. The requirements address the licensee's QA organization (§71.103); QA program (§71.105); package design control (§71.107); procurement document control (§71.109); instructions, procedures, and drawings (§71.111); document control (§71.113); control of purchased material, equipment, and services (§71.115); identification and control of material parts and components (§71.117); control of special processes (§71.119); internal inspections (§71.121); test control (§71.123); control of measuring and test equipment (§71.125); handling, storage, and shipping control (§71.127); inspection test and operating status (§71.129); nonconforming materials, parts, or components (§71.131); corrective action (§71.133); QA records (§71.135); and audits (§71.137).

The Quality Assurance Plan for Procurement, Use, Maintenance and Repair of packagings has addressed the 18 criteria specified within Annex 2 of the NRC's Regulatory Guide 7.10, promulgated by the Office of Nuclear Regulatory Research. The title of this document is *Establishing Quality Assurance Programs for Packaging Used in the Transport of Radioactive Material*. The NRC has inspected the MOC's QA program and found that it meets the requirements of 10 CFR Part 71, Subpart H.

The MOC conducted an audit regarding the transportation, receipt, and maintenance of the packagings in March 2000. The overall audit results indicated that all the programmatic requirements in these three areas were being administered adequately.

14.3 Compliance Status of the Certificate of Compliance

The NRC has issued C of Cs to the DOE for the packagings as registered user. All packagings are designed, fabricated, assembled, tested, procured, used, maintained, and repaired in accordance with the C of Cs.

14.3.1 Allowable Decay Heat, C of C, Page 3, 5(b)(2)

Decay heat per payload must not exceed the values given in the TRAMPAC of the TRUPACT-II SAR.

The decay heat within each payload container plus the measurement error shall be less than or equal to the decay heat limit specified in the TRAMPAC (TRUPACT-II Authorized Methods for Payload Control) in the TRUPACT-II SAR. The total decay heat from all containers in a TRUPACT-II shall be less than 40 watts.

The C of C identified the TRUPACT-II as a fissile material packaging. Therefore, the requirements specified in 10 CFR §71.59 must be met.

The methods for determining and controlling the physical form of the wastes are visual examination, radiography, acceptable knowledge, and sampling. The chemical properties of the waste are determined by the allowable chemical constituents within a given waste type and are restricted so that all the payload containers are safe for handling and transport. Chemical compatibility within the waste and between the waste and the packaging ensures that no chemical process will occur that might pose a threat to the safe transport of the payload in the TRUPACT-II package. The configuration of the payload container and content is controlled as described in the TRAMPAC. The TRAMPAC also describes specifications for filter vents and preshipping venting and aspiration requirements.

The isotopic inventory for each payload container and the fissile content are discussed in Section 3 of the TRAMPAC. Decay heat is discussed in Section 5 of the TRAMPAC.

The TRAMPAC discusses the payload shipping categories. The primary difference among the categories is their potential for gas generation and internal bagging configuration. For waste with an adequate margin of safety, an analytical prediction suffices. Wastes without such a margin of safety require testing as described in the TRAMPAC.

15.0 HAZARDOUS MATERIALS TRANSPORTATION ACT

15.1 Summary of the Law

The Hazardous Materials Transportation Act (HMTA) (49 U.S.C. §§5101 et seq.), as amended, is the major transportation-related statute that affects the DOE. The objective of the HMTA is "to improve the regulatory and enforcement authority of the Secretary of Transportation to protect the nation adequately against risks to life and property which are inherent in the transportation of hazardous materials in commerce." The HMTA provides for safe intra- and interstate transportation of hazardous materials (including nuclear materials).

The Federal Hazardous Materials Transportation Law (Pub. L. 103-429) was reauthorized on October 31, 1994. This public law, which amends the HMTA, required

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

the U.S. Department of Transportation (DOT) to set standards for designating routes for the transportation of hazardous materials that are required to be placarded, establish regulations on training standards for all hazardous materials transportation workers, issue safety permits to motor carriers for certain hazardous materials, and perform a railroad transportation safety study for certain highly radioactive materials. The DOT is also required to participate in international forums dealing with recommendations or legislation relating to mandatory standards and requirements pertaining to the transportation of hazardous materials, and to consult with interested agencies to facilitate consistency in international law with respect to hazardous materials transportation. In addition, the Hazardous Materials Transportation Uniform Safety Act requires registration and an annual registration fee for shippers and carriers of certain hazardous materials such as radioactive materials and establishes planning and training grants to the states for developing, improving, and implementing emergency plans.

Title 49 CFR Part 171, "General Information, Regulations, and Definitions," sets forth the DOT requirements that are applicable to the transportation of hazardous materials and the packaging used in the transportation of those materials.

Title 49 CFR Part 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications Requirements and Emergency Response Information and Training Requirements," lists and classifies the materials the DOT has designated as hazardous for the purpose of transportation and describes the communications regulations that apply when those materials are shipped.

In 49 CFR Part 173, "Shippers - General Requirements for Shipments and Packagings," the DOT defines hazardous material classes for the purpose of transportation; establishes requirements in preparing materials for shipment; sets forth inspection, testing, and retesting responsibilities concerning containers built, repaired, or conditioned for use in the transportation of hazardous materials; sets forth requirements for transporting radioactive materials; classifies materials having more than one hazard; and describes criteria for instructing those responsible for preparing hazardous materials for shipment.

In 49 CFR Part 175, "Carriage by Aircraft," the DOT prescribes additional requirements to those in 49 CFR Parts 171, 172, and 173 concerning the transportation of hazardous material by air. Title 49 CFR §171.11 is the interface between DOT and International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO). This allows air shipments to be made under IATA/ICAO regulations that are not in conflict with DOT regulations. All air shipments from WIPP are in compliance with DOT and IATA/ICAO regulations.

In 49 CFR Part 177, "Carriage by Public Highway," the DOT sets forth requirements to promote the uniform enforcement of law to minimize danger to life and property in the transportation of hazardous materials by public highway.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Title 49 CFR Part 178, "Specifications for Packagings," describes manufacturing and testing specifications for packaging and containers used for the transportation of hazardous materials.

15.2 Compliance Status of the Regulatory Requirements

Materials that were sent off-site were appropriately packaged and complied with the regulations for off-site transportation. The text gives more detail on the compliance status of regulatory requirements under HMTA.

15.2.1 General Requirements, 49 CFR §171.2

General requirements regarding the offering or acceptance of hazardous material for transportation in commerce are described. Material to be shipped must be properly classified, described, packaged, marked, labeled, and in condition for shipment.

General requirements for the shipment of hazardous material are addressed in the transportation program and implementing procedures, which identify the organizations and positions responsible for ensuring compliance with the HMTA. The completion and certification of several worksheets (e.g., Shipping Request, Shipment Worksheet for Ground Transportation, and Shipment Worksheet for Air Transportation) ensures compliance through careful documentation of all required actions.

15.2.2 Hazardous Waste, 49 CFR §171.3

Requirements for the shipment of hazardous wastes include the preparation of manifests or other shipping papers, motor vehicle placarding, waste packaging, marking and labeling, and identification numbers for the generators and the transporters.

Manifests, marking and placarding, and other labeling requirements are addressed in the Transportation Program. Completion of step-by-step worksheets and checklists ensure the proper execution of these tasks in shipping hazardous wastes from WIPP to an off-site TSDF.

15.2.3 Transitional Provisions for Implementing Certain Requirements, 49 CFR §171.14

Provides an orderly transition to the new requirements incorporated as part of a comprehensive revision to this subchapter based on the United Nations' Recommendations.

The transition period provided by 49 CFR §171.14 is used by the MOC to make the necessary changes to plans and procedures; obtain required labels, markings, and placards; and to complete the necessary training to ensure compliance with new regulations.

15.2.4 Immediate Notice of Certain Hazardous Materials Incidents and Detailed Hazardous Materials Incident Reports, 49 CFR §§171.15 Through 171.16

Section 171.15 specifies the requirements of immediate notification by each carrier who transports certain hazardous materials (including hazardous wastes) and is involved in a hazardous material incident during the course of transportation. Section 171.16 specifies the requirements for the submission of a written hazardous materials incident report by the carrier.

Requirements for transportation emergency notifications are specified in the MOC transportation program. This program and MOC procedures address reportable incident and reporting requirements, including the identification of organizations and other entities that receive reports. The transportation program specifies that the MOC will request a copy of the report submitted by the carrier to the DOT. During this reporting period there were no hazardous materials incidents as defined in these regulations.

15.2.5 Table of Hazardous Materials and Special Provisions, 49 CFR §172.101

The Hazardous Materials Table designates all materials listed as hazardous for the purpose of transporting those materials.

These requirements are covered in the MOC transportation program and apply to any "... material, including its mixtures and solutions that ... is listed in Table 172.101 and/or in appendices to 49 CFR §172.101, 'List of Hazardous Substances and Reportable Quantities.'" Transportation Engineers (TEs) are trained in the use of this table as specified in MOC procedures.

15.2.6 Shipping Papers, Subpart C, 49 CFR §§172.200 Through 172.205

This subpart describes the requirements for the provision of shipping papers by persons who offer hazardous material for transportation. The shipping papers must include a description of the hazardous material and a shipper's certification. A "bill of lading" or "hazardous waste manifest" may be used depending on the commodity being shipped.

Requirements concerning shipping papers, including manifests for hazardous waste and bills of lading for hazardous materials, are described in MOC procedures. Each required record is identified and defined by forms attached to these procedures.

15.2.7 Marking, Subpart D, 49 CFR §§172.300 Through 172.338

Marking requirements for the transportation of hazardous materials or substances are described in this subpart.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

According to MOC procedure, the TE marks the shipment in accordance with Subpart D of 49 CFR Part 172. The driver's responsibility for maintaining the markings is stated in the MOC transportation program and implementing procedures.

15.2.8 Labeling, Subpart E, 49 CFR §§172.400 Through 172.450

This subpart describes the requirements for the labeling of packages or containment devices by persons who offer hazardous material for transport.

According to MOC procedures, the TE labels the shipment in accordance with Subpart E of 49 CFR Part 172. The driver's responsibility for maintaining the labels is stated in the MOC transportation program and implementing procedures.

15.2.9 Placarding, Subpart F, 49 CFR §§172.500 Through 172.560

This subpart describes the requirements for the placarding of hazardous material by persons who offer hazardous material for transport.

According to an MOC procedure, the TE ensures that the vehicle that will transport hazardous materials or waste from WIPP is properly placarded, if necessary. The driver's responsibility for maintaining the placards is stated in the MOC transportation program and MOC implementing procedures.

15.2.10 Emergency Response Information, Subpart G, 49 CFR §172.600

This subpart describes the requirements for the provision of emergency response information during transportation and at facilities where hazardous materials are loaded for transportation, stored incidental to transportation, or otherwise handled during any phase of transportation.

According to an MOC procedure, the TE delivers the shipping papers and the *DOT Emergency Response Guides* for the particular shipment materials to the driver and releases the shipment. These procedures specify driver actions to be taken in the event of an incident during transportation. The TE provides the Central Monitoring Room with copies of transportation documentation. The Central Monitoring Room is the 24-hour emergency contact for all shipments of hazardous waste or materials.

The MOC addresses on-site emergency response in its procedures and waste management plans.

15.2.11 Training Subpart H, Federal/State Relationship, and Applicability and Responsibility for Training and Testing, and Training Requirements, 49 CFR §§172.700 Through 172.702 and 172.704

Prescribes minimal training requirements for the transportation of hazardous materials and specifies requirements that hazardous materials employers as established by DOT must meet to ensure that their hazardous materials employees are trained in a systematic program. The following requirements are included: states may impose more stringent training requirements under certain conditions; the training curriculum must include general awareness and familiarization, hazardous material recognition and identification, function-specific topics, and safety and emergency response information; and current hazardous materials employee training records must be maintained and contain specific training documentation including certification of training.

WIPP employees who are responsible for coordinating the transportation of hazardous materials must attend a hazardous material transportation course. Through this training program, hazardous materials employees become familiar with the applicable hazardous material regulations, are able to recognize and identify hazardous materials, are knowledgeable of function-specific hazardous material regulations, and are knowledgeable of emergency response information and hazardous material communications requirements. The MOC provides each hazardous materials employee at WIPP with initial and recurrent training in accordance with established schedules. New employees, or employees who change job functions and are required to attend the training, must do so within 90 days. Until completion of their training, they may work under the direct supervision of another certified hazardous materials employee. The MOC maintains records of current training, inclusive of the preceding three years. The training records are maintained in accordance with existing requirements. The TEs have qualification cards that must be satisfactorily completed prior to the performance of work without supervision. Requalification is required every two years.

15.2.12 General, Subpart A, 49 CFR §§173.1 Through 173.12

This subpart includes the requirements for preparing hazardous materials for shipment by air, highway, rail, or water and definitions and classifications of hazardous materials for transportation purposes.

The MOC procedures encompass the requirements of these sections. WIPP shipments are evaluated and authorized by an MOC TE to ensure that these requirements are met.

15.2.13 Preparation of Hazardous Materials for Transportation, Subpart B, 49 CFR §§173.21 Through 173.40

This subpart describes the general requirements for the preparation of hazardous materials for transportation. The shipper's responsibilities are described and include the hazard classification and description of hazardous material and the determination that the packaging or container is an authorized packaging and that it has been manufactured, assembled, and marked properly.

According to MOC procedures, the MOC's National TRU Programs Shipping Coordination Section is responsible for ensuring that materials are packaged, marked, and labeled in accordance with 49 CFR. Personnel packaging hazardous materials must be familiar with the packaging requirements for these materials, commensurate with the complexity of the packaging and the degree, nature, and quantity of hazard.

15.2.14 Definitions, Classification, and Packaging for Class 1 Materials, Subpart C, 49 CFR §§173.50 Through 173.63

Definitions, classifications, and requirements for packaging of Class 1 materials (explosives) are described.

The TE classifies and packages Class 1 material for shipment in accordance with MOC procedures.

In August 2000, Class 1 material was shipped from WIPP. The Class 1 material consisted of misfired cartridges or powder devices used in hand-held fastening guns.

15.2.15 Definitions, Classification, Packaging Group Assignments, and Exceptions for Hazardous Materials Other than Class 1 and Class 7, Subpart D, 49 CFR §§173.115 Through 173.156

Definitions, classifications, packing group assignments, and exceptions for hazardous materials, including flammable, non-flammable, poisonous and nonpoisonous gases, flammable liquids and solids, and toxic material are specified.

Applicable MOC procedures include worksheets for ground and air shipments. Actions required for the classification and packaging of hazardous materials other than Class 1 and Class 7 are included in these worksheets.

15.2.16 Non-Bulk Packaging Requirements for Hazardous Materials Other than Class 1 and Class 7, Subpart E, 49 CFR §§173.158 Through 173.229

Non-bulk packaging requirements for hazardous materials other than Class 1 and Class 7 materials are described. Specific

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

requirements are described in 49 CFR §§173.158 through 173.198 for nitric acid; wet batteries; corrosive nonexplosive smoke bombs; chemical kits; gallium; hydrogen fluoride; mercury; smokeless powder for small arms; aircraft hydraulic power unit fuel tanks; paint, paint-related material, adhesives and ink; refrigerating machines; liquid pyrophoric materials; barium azide; nitrocellulose-based film; highway or rail fuses; lithium batteries and cells; matches; pyrophoric solids, metals, or alloys; white or yellow phosphorus; certain Group 1 poisonous materials; mixtures of bromoacetone, methyl bromide, chloropicrin, and methyl chloride or of chloropicrin and methyl chloride or of chloropicrin and compressed gas; hydrogen cyanide; infectious substances; and nickel carbonyl.

An MOC procedure directs the TE to classify each shipment using the information provided in the shipping request by completing a shipment worksheet. If required, the requester and/or the TE obtain additional information to classify the shipment properly. Based on this information, the TE determines the packaging requirements.

15.2.17 Radioactive Materials, Subpart I, 49 CFR §§173.401 Through 173.476

This subpart sets forth requirements for the transportation of radioactive materials by carriers and shippers and includes requirements for package design, package testing, empty radioactive materials packaging, and NRC-approved packages.

The SAR and TRAMPAC control the packaging and shipment of radioactive waste to WIPP. These documents also define how packaging requirements are determined, including verification that the quantity and form of material to be shipped meet the requirements of the C of C and/or tested parameters of the intended package. More detail is provided in Chapter 14.0 herein under the NRC's regulations implementing transportation requirements under the AEA.

MOC TEs receive and ship radioactive materials in accordance with MOC procedures.

15.2.18 Carriage by Aircraft, 49 CFR Part 175

This part describes requirements that must be observed with respect to the transportation of hazardous materials in aircraft. Included are provisions relating to unacceptable hazardous materials shipments; acceptance and inspection of shipments; discrepancy reports; notification of the pilot in command; shipping papers; keeping and replacement of labels; reporting hazardous materials incidents; quantity limitation; orientation, securing, and location of cargo containing hazardous materials; compatibility of packages; damaged shipments; and specific regulations applicable according to the classification of the material, including

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

special limitations and requirements for Class 7 (i.e., radioactive) materials.

An MOC procedure provides guidance for shipping hazardous materials by air. Hazardous materials shipped by air from WIPP are in accordance with the IATA, ICAO, and 49 CFR §171.11. There was one air shipment of hazardous materials during this reporting period.

The transportation of hazardous waste by air transport is prohibited.

15.2.19 General Information and Regulations, Subpart A, 40 CFR §177.800; Driver Training, 49 CFR §177.816; and Routing of Class 7 (Radioactive) Materials, Subpart D, 49 CFR Part 397

These sections set forth requirements for training, including the following: a carrier may not transport or cause to be transported hazardous material by motor vehicle unless each of its hazardous materials employees has received the appropriate specialized training. Each of the carrier's hazardous materials drivers must have the appropriate state-issued commercial driver's license with the proper endorsement. Drivers transporting a Class 7 Highway Route Controlled Quantity of (radioactive) materials must have received written training within the previous two years and must have in his or her immediate possession a certificate of training that includes a proper statement of authentication.

All transportation of radioactive waste and hazardous waste has been by contract carrier. The carrier's employees are properly trained, and their records include all certification information. The carrier's drivers all possess a commercial driver's license with a hazardous material endorsement, and each is trained and certified to transport highway route controlled-quantity radioactive materials. Each driver has a properly authenticated training certificate in his or her possession.

The MOC has a motor carrier program plan for the local transport of empty packaging and miscellaneous material.

15.2.20 Specifications for Packagings, 49 CFR Part 178

This part contains prescribed manufacturing and testing specifications and inspection requirements for packaging and for containers used for the transportation of hazardous materials.

WIPP QA procedures define the methodology by which specified criteria are verified. The TRUPACT-II container has been developed to transport CH TRU waste to WIPP from the generator sites. The WIPP WAC requires DOT Specification 7A Type A packagings for WIPP storage and disposal. Packaging purchased for the transport of hazardous materials from WIPP receives a QA review beginning with the purchase

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

order and completed with acceptance of packaging for use. The MOC's TEs use an MOC procedure worksheet to specify the performance-oriented packaging necessary to satisfy packaging requirements for each shipment of hazardous materials from WIPP.

16.0 MATERIALS ACT OF 1947

16.1 Summary of the Law

The Materials Act of 1947 (30 U.S.C. §§601 et seq.) establishes policy that directs the BLM to prescribe rules and regulations for the disposal of mineral material resources (including, but not limited to, sand, stone, gravel, pumice, cinders, and clay) on public lands under the BLM's jurisdiction at fair market value while ensuring that adequate measures are taken to protect the environment and to minimize damage to public health and safety during the authorized removal of such minerals. Under the act, no mineral material shall be disposed of if the Secretary of the U.S. Department of the Interior (DOI) determines that the aggregate damage to public lands and resources would exceed the benefits to be derived from the proposed sale or free use of the material.

The policy of the Materials Act of 1947 is addressed in the 1992 LWA. In the LWA, the DOE was given authority and responsibility for the management of the withdrawn land at WIPP and the disposal of mined salt consistent with the Materials Act of 1947, the LWA, and other applicable laws such as the Federal Land Policy and Management Act and the Public Rangelands Improvement Act (see Chapter 18.0, Public Rangelands Improvement Act, and Chapter 19.0, Taylor Grazing Act, herein, respectively). The LWA directs the DOE to produce a WIPP land management plan (LMP) to address the disposal of salt tailings in accordance with the Materials Act of 1947. The regulations in 43 CFR Part 3600, "Mineral Materials Disposal: General," implement the Materials Act of 1947 and establish procedures for the disposal of mineral material resources.

16.2 Compliance Status of the Regulatory Requirement

During this reporting period, no salt was contracted under the auspices of the Materials Act. Therefore, regulations do not apply.

17.0 FEDERAL LAND POLICY AND MANAGEMENT ACT

17.1 Summary of the Law

One of the objectives of the Federal Land Policy and Management Act (FLPMA; 43 U.S.C. §§1701-1782) is to ensure that:

... public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

Title II under FLPMA, *Land Use Planning; Land Acquisition and Disposition*, directs the Secretary of the Interior to prepare and maintain an inventory of all public lands and to develop and maintain, with public involvement, land-use plans regardless of whether subject public lands have been classified as withdrawn, set aside, or otherwise designated. Under Title V, *Rights-of-Way*, the Secretary of the Interior is authorized to grant, issue, or renew rights-of-way over, upon, under, or through public lands.

The policy and commitment of the FLPMA are addressed in the LWA. The LWA gave the DOE authority and responsibility for the management of the withdrawn land consistent with FLPMA, the LWA, and other applicable laws such as the Public Rangelands Improvement Act and the Taylor Grazing Act (see also Chapters 18.0 and 19.0 herein, respectively). The LWA directed the DOE to produce a WIPP LMP to provide for grazing, hunting and trapping, wildlife habitat, the disposal of salt tailings, and mining, consistent with the applicable implementing regulations of FLPMA, as appropriate. The WIPP LMP (DOE/WIPP 03-004) was last revised in January 2002.

A process was established in the implementing regulations of 43 CFR Part 1600, "Planning, Programming, Budgeting," for the development, approval, maintenance, amendment, and revision of resource management plans for public lands administered by the BLM. This part states that the objective of resource management planning is to guide and control future management actions and the development of subsequent more detailed and limited scope plans for resources and uses consistent with the principles of Title II of FLPMA. To the extent it is consistent with WIPP's mission, the DOE must develop and maintain a LMP consistent with the processes and requirements for resource management plans as described in these regulations.

Other regulations implementing FLPMA established procedures for the orderly and timely processing of applications, grants, permits, amendments, assignments, and terminations for rights-of-way and permits over, upon, under, or through public lands. In particular, 43 CFR Part 2800, "Rights-of-Way, Principles and Procedures," provides guidelines for the use of right-of-way and temporary-use permit areas and establishes requirements for the submission and processing of right-of-way grant/reservation and temporary-use permit applications. These regulations remain applicable to WIPP because of the necessity to establish rights-of-way for the construction and phased operation of this facility.

17.2 Compliance Status of the Regulatory Requirements

The text provides more detail on the compliance status of each FLPMA requirement. It should be noted that the LWA has limited the DOE's compliance with FLPMA, and other applicable laws to the extent such compliance is consistent with the LWA and with WIPP-related uses of the withdrawn land. As such, it is up to the Secretary of Energy, in consultation with the Secretary of the Interior, to determine applicability as necessary and appropriate.

17.2.1 Resource Management Planning Guidance, 43 CFR §1610.1

Guidance in preparing resource management plans may be provided to the District and Area BLM Managers by the Director and state Director of the BLM.

The WIPP LMP was prepared for the DOE by its MOC with considerable input from the BLM. No changes to the plan occurred during this BECR reporting period.

17.2.2 Public Participation, 43 CFR §1610.2

The public shall be provided an opportunity to review and comment on land management plans.

Public meetings were held in Carlsbad and Hobbs, New Mexico, and members of the public were given 30 days to review and comment on the WIPP LMP. A copy of the draft plan was also sent to the Governor's Radioactive Waste Consultation Task Force, the State Land Office (SLO), the Environmental Evaluation Group (EEG), and the NMED for their review. The comments obtained were incorporated, as appropriate, into the final document.

17.2.3 Consistency of Management Plans, 43 CFR §1610.3-2

Land-use plans shall be consistent with the purposes, policies, and programs of federal laws and regulations that apply to public lands.

As a requirement of the LWA, the WIPP LMP was developed for the withdrawal area consistent with FLPMA. The plan was drafted by the DOE and its MOC in consultation with the BLM and the state of New Mexico and was submitted to Congress in October 1993.

17.2.4 Common Terms and Conditions of Right-of-Way Reservations and Temporary-Use Permits, 43 CFR §2801.2(a)

By accepting a right-of-way reservation or a temporary-use permit, the applicant agrees and consents to comply with the following terms and conditions in addition to those terms and conditions that are specified in the reservation(s) or permit(s). The common terms and conditions are:

- *To comply with all applicable state and federal laws and the implementing regulations to the extent practicable;*
- *To protect employees and applicants for employment who will be or are involved in the construction, operation, maintenance, and termination of the authorized use against*

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

discrimination because of race, creed, color, sex, or national origin and to ensure that all subcontracts include an identical provision;

- *To rebuild and repair roads, fences, and established trails that may be destroyed or damaged by the construction, operation, or maintenance of the project and to build and maintain suitable crossings for existing roads and significant trails that intersect the project; and*
- *To prevent and suppress fires on or in the immediate vicinity of the right-of-way areas.*

Compliance with all applicable state and federal laws and their implementing regulations is discussed throughout this document. (See the specific regulations and the compliance status section of each for more detailed information.)

The DOE and its contractors have a nondiscrimination policy in effect for their employees and for hiring. In addition, contracts and subcontracts awarded by the DOE and by its contractors include such a nondiscrimination clause.

Any roads, fences, or established trails destroyed or damaged by the construction, operation, or maintenance of any of the structures for which the CBFO has received a right-of-way reservation or temporary-use permit for WIPP are repaired as required.

The MOC maintains fire-fighting equipment at WIPP. Some WIPP emergency response personnel are trained in fire-fighting methods. The CBFO has an agreement with the Carlsbad Fire Department to provide fire-fighting services at WIPP if necessary.

17.2.5 Conditions to be Incorporated Within all Right-of-Way Reservations and Temporary-Use Permits, 43 CFR §2801.2(b)

All right-of-way reservations and temporary-use permits must contain requirements to ensure:

- *Restoration, revegetation, and curtailment of land erosion;*
- *Compliance with applicable air- and water-quality standards;*
- *Protection of scenic, aesthetic, cultural, and environmental values as well as federal property and public health and safety;*
- *Protection of the interests of local inhabitants who rely on the fish, wildlife, and biota of the area for subsistence;*

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

- *Maintenance and operation of facilities on the prescribed location in a manner that is consistent with the reservation or permit; and*
- *Compliance with any state standards for public health and safety; environmental protection; and siting, construction, operation, and maintenance that are more stringent than the federal standards.*

Each area that is the subject of a right-of-way reservation will be reclaimed and revegetated as described in the WIPP LMP.

Compliance with applicable air- and water-quality standards is discussed in Chapter 6.0, Clean Air Act; Chapter 7.0, Federal Water Pollution Control Act of 1972 ("Clean Water Act"); Chapter 8.0, Safe Drinking Water Act; Chapter 28.0; and Chapter 29.0, New Mexico Water Quality Act, of this report. (See these sections for more specific information pertaining to the air- and water-quality standards.)

Protection of scenic, aesthetic, cultural, and environmental values was addressed in the FEIS and the SEIS. A second SEIS was prepared to address disposal of TRU waste at WIPP; the LMP; and the Joint Powers Agreement with the state of New Mexico. Any changes in previous values or the potential impact of WIPP operations on those values are addressed in the WIPP LMP.

The people who live in the vicinity of the WIPP facility are ranchers. There are no local inhabitants who rely on fish and wildlife of the area for subsistence. Various sections in this report and the WIPP LMP describe activities that protect these interests.

Each "facility" (road, pipeline, railroad, etc.) is maintained and operated in accordance with the stipulations provided in the respective right-of-way reservation. (See Section 17.3 below for more specific information.) Standards or permit conditions imposed by the state are being met.

17.2.6 Requirements for Applications for Right-of-Way Reservations and Temporary-Use Permits, 43 CFR §2802.2

Parties seeking a right-of-way reservation or temporary-use permit involving the use of public lands shall file an application for the reservation or permit with either the Area Manager, the District Manager, or the State Director having jurisdiction over the affected public lands.

To date, several right-of-way reservations and land-use permits have been granted to the DOE. The following are examples of WIPP reservations and permits.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Right-of-way Reservation No. NM 53809 for a water pipeline was granted on August 17, 1983, and is still active. This Reservation is held in perpetuity. (See Subsection 17.3.2 below.)

Right-of-way Reservation No. NM 55676 for the north access road at WIPP was granted on August 24, 1983, and is still active. This Reservation is held in perpetuity. (See Subsection 17.3.3 below.)

Right-of-way Reservation No. NM 55699 for the railroad spur at WIPP was granted on September 27, 1983, and is still active. This Reservation is held in perpetuity. (See Subsection 17.3.4 below.)

Right-of-way Reservation No. NM 77921 for an aerosol sampling site was granted on August 18, 1989, and is still active. The permit expires August 18, 2019. (See Subsection 17.3.5 below.)

Free-Use Caliche Permit No. NM 96943 was renegotiated on January 9, 1997, and is extended to April 9, 2000. This permit expired on April 9, 2000. Reclamation has been completed. (See Subsection 17.3.6 below.)

A right-of-way permit for a high-volume air sampler has also been issued to WIPP. Because the permit was issued by the New Mexico Commissioner of Public Lands, it is discussed in more detail in Section 34.3 herein.

17.3 Compliance Status of the Permit Conditions

The following text provides more detail on the compliance status of each right-of-way reservation or temporary-use permit awarded to WIPP by the BLM.

17.3.1 Common Conditions of the Right-of-Way Reservations

Several conditions are common to all the right-of-way reservations awarded to WIPP by the BLM. These common conditions are:

- (1) That the subject of the reservation be under the control and jurisdiction of the DOE;*
- (2) That right of access and use is reserved to DOE personnel and those authorized by DOE and to BLM personnel and their authorized permittees, licensees, and lessees;*

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

- (3) *That any products or resources on lands within the right-of-way remain under the jurisdiction of the issuing agency;*
- (4) *That all applicable regulations under 43 CFR Part 2800 be followed; and*
- (5) *That seeding requirements received mutual concurrence of the BLM and DOE.*

The subjects of each of the right-of-way reservations are under the control and jurisdiction of the DOE. Right of access and use of these structures is reserved to the DOE and the BLM and their authorized personnel.

The WIPP LWA legislation transferred administrative responsibility for WIPP lands from the DOI to the DOE. These lands were also withdrawn from all forms of entry, appropriation, and disposal under the public land laws, including the mineral leasing laws (subject to existing, valid rights).

The applicable portions of 43 CFR Part 2800 and the compliance status of each are described in Subsections 17.2.4 through 17.2.6 above.

Reclamation of disturbed areas is an ongoing activity at WIPP and is performed as described in the WIPP LMP. Seeding is conducted in accordance with the requirements for the BLM Roswell District.

17.3.2 Right-of-Way Reservation No. NM 53809, Water Pipeline

The conditions specified for the water pipeline right-of-way reservation are described in this section, along with the compliance status of each condition.

The reservation was awarded on August 17, 1983, and extends to perpetuity.

17.3.2.1 Preconstruction and Construction Conditions for the Water Pipeline, Section 13 and Standard Stipulation Nos. 1, 2, 5, 6, 8

Preconstruction notification and conditions for construction (e.g., minimization of blading and clearing of vegetation; protection of scenic values; permits; livestock barriers) were specified in the right-of-way reservation and in the Standard Stipulations for Pipeline and Underground Cable Rights-of-Way in the Roswell District, BLM.

All conditions were met when the water pipeline was constructed.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

17.3.2.2 Livestock Water, Section 13.E

The DOE has agreed to provide water access (taps) off the waterline for livestock in the area. The DOE will also provide water meters and all necessary materials, equipment, and labor to install new water troughs in the four sections specified.

The DOE installed water taps on the water pipeline for use by ranchers.

17.3.2.3 Road Construction, Standard Stipulation No. 3

Roads will not be constructed where terrain features allow vehicles to maneuver without the aid of such construction. All vehicular traffic and construction activities will be confined to the authorized right-of-way.

No roads have been constructed where the terrain allows vehicles to maneuver adequately. All traffic is confined to the authorized right-of-way.

17.3.2.4 Gates or Cattle Guards on Public Lands, Standard Stipulation No. 7

Gates or cattle guards on public lands will not be locked or closed to the public.

Gates and cattle guards on public lands are not locked and remain open to the public.

17.3.3 Right-of-Way Reservation No. NM 55676, North Access Road

The conditions specified for the North Access Road right-of-way reservation are described in this section, along with the compliance status of each condition. Since the road was built approximately ten years ago, the conditions required for its construction are not discussed individually. This reservation was awarded on August 24, 1983, and extends to perpetuity.

17.3.3.1 Polychlorinated Biphenyls, Standard Stipulation No. 2

Any PCB shall be used in a totally enclosed manner in accordance with the provisions of the Toxic Substances Control Act. Any release of PCB in excess of the RQ shall be reported as required under the Comprehensive Environmental Response, Compensation, and Liability Act, with a copy of any report required by the federal or state agency being provided to the Authorized Officer within five working days of the occurrence of the spill or release.

As described in Chapter 9.0, Toxic Substances Control Act, herein, all PCB-containing equipment and fluids have been removed from the WIPP site and have been disposed

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

of in accordance with the regulations. No release or spill of PCBs or PCB-containing fluids is known to have ever occurred at WIPP. These conditions do not apply at WIPP. Currently no PCBs are allowed on-site. An Initial Report requesting authorization to store and dispose of TRU and TRU mixed waste contaminated with PCBs at WIPP, in accordance with the chemical waste landfill provisions of 40 CFR §761.65, was submitted to EPA Region VI on March 22, 2002.

If an incident involving PCBs were to happen on a right-of-way within the WIPP boundary, the New Mexico State Police would respond and provide the proper notifications.

17.3.3.2 Standard Stipulations for the Construction of Overhead Electric Distribution Lines, Standard Stipulation Nos. 3 Through 5

Upon DOE's request, BLM authorized the DOE to install an auxiliary electrical line and 10-13 poles along the right-of-way for the North Access Road. This authorization was accompanied by standard stipulations for overhead electrical distribution lines in the Roswell District. The standard stipulations for the construction of power lines included a prohibition of clearing or blading of the right-of-way unless agreed to in writing by the Authorized Officer, construction of the power lines to ensure the safety of raptors, and minimization of damage to existing fences and other improvements on public lands.

All stipulations for the construction of power lines were met.

17.3.3.3 Posting of BLM Serial Number, Standard Stipulation No. 6

The BLM serial number assigned to this authorization (i.e., NM 55676) shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers must be at least 2 inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

The BLM Serial Number (NM 55676) is posted as required.

17.3.3.4 Actions Required upon Abandonment, Relinquishment, or Expiration of Right-of-Way Reservation, Terms/Conditions, Nos. 7 and 8

Upon cancellation, relinquishment, or expiration of the reservation, the holder of the reservation will comply with those abandonment procedures prescribed by the BLM Authorized Officer. All surface structures (poles, lines, transformers, etc.) will be removed within 180 days of abandonment, relinquishment, or termination of use of the reservation or of the use of the serviced

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

facility or facilities. This will not apply where the power line extends service to an active adjoining facility or facilities.

These conditions will be met upon termination of the reservation or abandonment of the site by the DOE.

17.3.3.5 Fencing, Amendment (April 22, 1988)

The DOE requested that it be allowed to install fencing on the east and west sides of the WIPP North Access Road for a distance of 12.125 miles to allow for a safe travel route when entering or leaving the site via Highway 62/180. The BLM allowed this installation, subject to the BLM fencing standards.

The BLM fencing standards were met in installing the fence along the North Access Road.

17.3.4 Right-of-Way Reservation No. NM 55699, Railroad

The conditions specified for the railroad right-of-way reservation are described in this section, and the compliance status of each condition is given. Since the railroad spur at WIPP was constructed a number of years ago, the conditions pertaining to the construction of the spur are not discussed individually.

This right-of-way reservation was awarded on September 27, 1983, and extends to perpetuity.

17.3.4.1 Preconstruction and Construction Requirements for the Railroad Spur, Standard Stipulation Nos. 1 Through 4, 7 Through 9, and 11

The preconstruction and construction conditions for the railroad spur were listed in the "Special Stipulation for WIPP Railroad Access." These conditions include preconstruction notification and a prework conference, notification of any anticipated changes, notification of grazing permittees or lessees prior to entering public lands on grazing allotments, barriers and fences for livestock, road or stock trail crossings, mitigation of cultural resources, and installation of fences.

Agreement was reached among members of the BLM, the DOE, and the Army Corps of Engineers with respect to the DOE's meeting all preconstruction and construction requirements.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

17.3.4.2 Reseeding upon Completion of Construction, Standard Stipulation No. 5

The right-of-way must be reseeded upon completion of railroad construction according to BLM seeding requirements for the Roswell District.

The right-of-way was reseeded upon completion of railroad construction in accordance with the BLM seeding requirements for the Roswell District.

17.3.4.3 Abandonment of the Site, Standard Stipulation No. 6

If the WIPP is abandoned for any reason, the railroad bed will be ripped and returned as much as possible to its original terrain. The area will be reseeded as discussed in Subsection 17.3.4.2 above.

If the site is abandoned, these actions will be conducted. Until such time, these conditions are not applicable.

17.3.4.4 Access to Water for Livestock, Standard Stipulation No. 10

The DOE will provide a water tap and a livestock watering facility in one section, a livestock drinker and related pipeline in a second section, and a water pipeline to tie into an existing water tub in a third. This action is separate and apart from the railroad reservation and will be implemented after completion of the Cooperative Agreement among the DOE, the BLM, and the rancher.

Water taps and related equipment have been provided by the DOE. (See also Subsection 17.3.2.2 above.)

17.3.4.5 Removal of Caliche and/or Other Mineral Material, Standard Stipulation No. 12

The grantee and its subcontractor will remove caliche and/or other mineral material from BLM-approved sites only. The DOE will submit a pit development and rehabilitation plan to the BLM for its approval before removing any caliche.

An application for a free-use caliche permit was submitted to the BLM by the DOE. The permit was awarded by the BLM. (See also Subsection 17.3.6 below.)

17.3.4.6 Application for Free-Use Permits, Standard Stipulation No. 13

The DOE will sign applications for BLM free-use permits for the borrowing of caliche, sand, gravel, and other construction

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

materials in quantities that may be reasonably required for this project.

The DOE submitted an application to the BLM for a free-use permit for caliche. The permit was granted by the BLM. (See also Subsection 17.3.6 below.)

17.3.4.7 Notification of the BLM Regarding the Access Road Parallel to the Railroad, Amendment

An access road parallel to the railroad was deemed necessary. Since the existing access road, constructed in conjunction with the railroad, is located within 75 feet of the railroad centerline (i.e., within the railroad right-of-way), no new right-of-way was required. However, notification to the BLM was needed.

The BLM was notified as specified.

17.3.5 Right-of-Way Reservation for an Aerosol Sampling Site, No. NM 77921 (NM 77860)

The conditions for the right-of-way reservation for an aerosol sampling site are discussed in this section, along with the compliance status of each condition. Right-of-way reservation No. NM 77921 was granted on August 18, 1989. (It was originally granted as No. NM 77860, but the number had already been issued and was subsequently changed.) The reservation was made for a 30-year term and is renewable.

17.3.5.1 Construction, Operation, and Maintenance, 1

The facility will be constructed, operated, and maintained in accordance with the details specified in the application submitted on July 31, 1989.

The application (dated July 13, 1989) specified that a 6-foot metallic stand would be positioned on an existing concrete pad, an electrical hookup would be made to an existing power line, and a chain-link security fence would be emplaced. It also indicated that the monitoring station would be used throughout the life of the project and would be operated throughout each year of the project. These conditions have been met.

17.3.5.2 Security and Operation of the Aerosol Sampling Station, 3

The DOE will be responsible for the security and day-to-day operation of the facility.

The DOE is responsible for the security of the aerosol sampling station, and MOC personnel operate and maintain the station under contractual authority from the DOE.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

17.3.5.3 Rehabilitation of the Land Occupied by the Aerosol Sampling Station, 5

Upon cancellation of this right-of-way reservation, the CBFO will ensure that the land is rehabilitated as specified. All structures, improvements, and debris will be removed and all disturbed surfaces reseeded with pure live seed (Seed Mixture 2) containing no weeds as specified in the BLM Seeding Requirements in the Roswell District. Until the reservation is canceled or terminated, these conditions are not applicable.

17.3.5.4 Use of the Abandoned Concrete Slab

A concrete slab was present at the location of the right-of-way land. The slab had been owned by the El Paso Natural Gas Company. Cognizant MOC personnel requested the use of the slab for radiation monitoring. El Paso Natural Gas Company personnel stated that the slab could be used if their personnel in Jal, New Mexico, were notified prior to initiating construction and if the BLM gave its consent.

Discussions were held with personnel from the El Paso Natural Gas Company. No additional conditions were specified, and notifications were made as requested by El Paso Natural Gas Company.

The BLM's issuance of this right-of-way reservation constitutes its implied approval of use of the concrete slab.

17.3.6 Caliche Free-Use Permit, No. NM 96943

The conditions specified under this permit are discussed in this section, and the compliance status of each condition is given. The Caliche Free-Use Permit was renegotiated January 9, 1997, and extended to April 9, 2000. This permit expired April 9, 2000. Reclamation has been completed.

17.3.6.1 Reclamation of the Caliche Borrow Pit

Upon completion of its withdrawal of caliche from the caliche borrow pit, the DOE will perform reclamation and other closure activities, including reseeding, as specified under the permit.

The slopes have been recontoured in accordance with BLM requirements.

18.0 PUBLIC RANGELANDS IMPROVEMENT ACT

18.1 Summary of the Law

Congress has recognized that vast segments of public rangelands produce less than their potential for livestock, wildlife habitat, recreation, forage, and water and soil conservation benefits. The 1978 Public Rangelands Improvement Act (43 U.S.C.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

§§1901, et seq.) was enacted to address the concerns that such rangelands could remain in such an unsatisfactory condition and that some areas could decline further under existing levels of management.

With the passage of this act, Congress reaffirmed a national policy and commitment to:

- Inventory and identify current public rangeland conditions and trends;
- Manage, maintain, and improve the condition of public rangelands so that they become as productive as is feasible; and
- Continue the policy of protecting wild free-roaming horses and burros while facilitating the removal and disposal of excess wild free-roaming horses and burros that pose a threat to themselves, their habitat, and other rangeland values.

This policy and commitment are echoed in other statutes that address public land use and management. One such act, FLPMA, directs the Secretary of the Interior to prepare and maintain an inventory of all public lands and to develop and maintain land-use plans with public involvement regardless of whether the public lands have been classified as withdrawn, set aside, or otherwise designated (see Chapter 17.0, Federal Land Policy and Management Act, herein). Another statute, the LWA, transferred jurisdiction over, and statutory authority and responsibility for, the management of the withdrawn lands at WIPP from the DOI to the DOE. Section 4 of the LWA, Establishment of Management Responsibilities, directs the DOE to conduct the management of grazing consistent with such laws as the Public Rangelands Improvement Act, the Taylor Grazing Act (Chapter 19.0 herein), the LWA, and other applicable laws such as Title IV, "Range Management," of the FLPMA (Chapter 17.0 herein).

The implementing regulations under Subchapter D, "Range Management," of 43 CFR Part 4100, "Grazing Administration - Exclusive of Alaska," provide uniform guidance for the administration of grazing on public lands. The objectives of these regulations include the following: orderly use, improvement, and development; enhancement of productivity by prevention of overgrazing and soil deterioration; and provision of inventory and categorization of public rangelands on the basis of range conditions and trends. The regulations specify that grazing on administered public lands must be managed in accordance with applicable land-use plans. These plans must set forth program constraints and the general management practices needed to achieve the management objectives.

18.2 Compliance Status of the Regulatory Requirement

The text discusses the compliance status of the Public Rangelands Improvement Act requirements in more detail.

18.2.1 Land Use Plans, 43 CFR §§4100.0 Through 4100.8

Grazing on administered public lands shall be managed under the principle of multiple use and sustained yield and must be in accordance with the applicable land-use plan.

As addressed in the WIPP LMP, the DOE's intent is to continue current range-management practices with no immediate changes. Grazing will continue on the withdrawn lands as it has since the inception of the WIPP Project. Range-management plans include (1) continued management of two affected grazing allotments under multiple-use management and sustained yield; (2) continued vegetative monitoring, which will include collecting data on actual livestock use, wildlife use, and degree of use of key forage species; and (3) continued monitoring studies to determine range condition and trends. In accordance with the WIPP LMP, the BLM will administer all range management activities.

19.0 TAYLOR GRAZING ACT

19.1 Summary of the Law

Although the United States does not and cannot hold property for private or personal purposes, it controls public lands under constitutional grant, acting through Congress. Control over public lands is in the hands of Congress; with this power, Congress may prohibit or fix the terms under which public lands may be used.

The Taylor Grazing Act of 1934 (43 U.S.C. §§315 et seq.) was enacted by Congress for the purpose of establishing a means for federal management of public lands used for grazing. The intent of Congress was to aid the livestock industry by defining grazing rights and to protect these rights by regulation. This act is intended to prohibit injury to public grazing lands from unregulated grazing and directs the orderly use of and improvement to public grazing lands by establishing grazing districts and a grazing permit system.

The LWA withdrew public lands and transferred jurisdiction over WIPP site lands from the DOI to the DOE. As a result of the LWA, the DOE was given statutory authority and responsibility for the management of the withdrawn land consistent with FLPMA (see Chapter 17.0 herein), the LWA, and other applicable laws such as the Taylor Grazing Act. Under the LWA, the DOE may allow grazing to continue where it was established before the enactment of the LWA, consistent with the applicable implementing regulations of the Taylor Grazing Act such as 43 CFR Part 4100, "Grazing Administration - Exclusive of Alaska," although the BLM continues to administer the grazing permit program and collects the grazing fee. The WIPP land withdrawal area affects two grazing allotments (i.e., land designated and managed for the grazing of livestock).

The implementing regulations of 43 CFR Part 4100 provide uniform guidance for the administration of grazing on public lands, exclusive of Alaska. The objectives of these

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

regulations are as follows: orderly use, improvement, and development of public grazing lands; enhancement of grazing land productivity by the prevention of overgrazing and soil deterioration; stabilization of the livestock industry dependent upon the public range; and provision of inventory and categorization of public rangelands on the basis of range conditions and trends. These objectives must be consistent with land-use plans, multiple-use, sustained yield, environmental values, and other general objectives as stated by the Taylor Grazing Act.

19.2 Compliance Status of the Regulatory Requirements

The text gives more detail on the compliance status of each requirement under the Taylor Grazing Act.

19.2.1 Land Use Plans, 43 CFR §§4100.0 Through 4100.8

Grazing on public lands shall be managed under the principles of multiple use and sustained yield in accordance with applicable land-use plans.

In accordance with the WIPP LMP, the BLM will ensure that range management activities are carried out under the authority of the Taylor Grazing Act of 1934, FLPMA (Chapter 19.0 herein), and the Public Rangelands Improvement Act (Chapter 18.0 herein). The principles of multiple use and sustained yield are basic to the management of these activities. The DOE's intent is to continue current management practices with no immediate changes in current operations. (See also Subsection 18.2.1 herein.)

19.2.2 Allotment Management Plans, 43 CFR §4120.2

An allotment management plan shall be prepared in careful and considered consultation, cooperation, and coordination with BLM personnel, the landowners involved, the district grazing advisory board, and any other affected interests.

The WIPP land withdrawal area affects two grazing allotments administered by the BLM: the Livingston Ridge and Antelope Ridge. Portions of both allotments lie within the withdrawal area. No formal grazing system has been implemented for the Livingston Ridge; however, a recent review by the BLM of actual-use data indicates that there is pasture rotation, with some pastures being rested for at least a portion of the growing season. The Antelope Ridge allotment is leased to a livestock rancher; in consultation with the BLM, an allotment management plan has been developed for this allotment. The plan includes a five-pasture rotation system, with some pastures being rested for full years and others receiving growing season rest. WIPP is contained within an area of 300 acres within the Antelope Range allotment that is posted against trespass and fenced to prevent grazing. The 277-acre DOE Exclusive Use Area and 23 additional acres set aside for reclamation sites, storage yards, etc., are the only portions of the withdrawal area not currently used for livestock activity.

20.0 BALD AND GOLDEN EAGLE PROTECTION ACT

20.1 Summary of the Law

The Bald and Golden Eagle Protection Act (16 U.S.C. §668-668d) makes it unlawful to take (i.e., capture, kill, or destroy), possess, molest, or disturb bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), alive or dead, their nests, or their eggs anywhere in the United States. A permit must be obtained from the DOI to relocate any nest that interferes with resource development or recovery operations. The Bald and Golden Eagle Protection Act is implemented by several parts under 50 CFR Subchapter B, "Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants." These implementing regulations are found in 50 CFR Parts 13, 17, 21, and 22.

The regulations in 50 CFR Part 13, "General Permit Procedures," provide uniform rules, conditions, and procedures for the application for, and the issuance, denial, suspension, revocation, and general administration of, all permits issued pursuant to 50 CFR Subchapter B. The provisions in this part are in addition to other regulations, such as the Migratory Bird Treaty Act (Chapter 21.0 herein) and the Endangered Species Act (Chapter 22.0 herein), and apply to all permits issued under these regulations, including 50 CFR Parts 17, 21, and 22.

The regulations of 50 CFR Part 17, "Endangered and Threatened Wildlife and Plants," which also implement the Endangered Species Act and are discussed in Chapter 22.0 herein, could apply to WIPP because of the potential for the presence of the endangered bald eagle. The regulations in this part outline permit requirements for activities involving endangered wildlife and identify those species of wildlife and plants recognized as endangered or threatened with extinction.

The purpose of the regulations in 50 CFR Part 21, "Migratory Bird Permits," is to supplement the general permit regulations of Part 13 of Subchapter B with respect to permits for the taking, possession, transportation, sale, purchase, barter, importation, exportation, and banding or marking of migratory birds. Title 50 CFR §21.22 outlines the requirements and procedures for the permits needed to band or mark bald and golden eagles. The requirements under 50 CFR Part 21 are discussed in Chapter 21.0 herein.

The purpose of the regulations in 50 CFR Part 22, "Eagle Permits," is to govern the taking, possession, and transportation of bald and golden eagles for scientific, educational, and depredation-control purposes and for the religious purposes of Indian tribes. The import, export, purchase, sale, and or barter of bald or golden eagles, their parts, nests, or eggs are not permitted by any regulation of Subchapter B.

20.2 Compliance Status of the Regulatory Requirements

The text provides more detail on the compliance status of the Bald and Golden Eagle Protection Act requirements.

20.2.1 Permit Application Procedures, 50 CFR §13.11

Applicants must submit separate applications for each permit on prescribed forms and must follow prescribed forwarding instructions.

At present, no bald or golden eagles are nesting on the WIPP site; however, individual eagles overwinter on WIPP lands. Overwintering eagles are provided considerations during determinations of all land-use actions. WIPP personnel will file an application for an eagle permit as required if the need for such a permit is perceived. Other permit requirements under 50 CFR Part 13, which would become applicable were a need to arise to disturb or relocate a bald or golden eagle, are discussed in Chapter 21.0 herein.

20.2.2 General Permit Requirements, 50 CFR §22.11

No person shall take, possess, or transport any bald or golden eagle, living or dead, or the parts, nest, or eggs of such birds except as authorized under terms of a valid issued permit.

WIPP personnel will apply for a permit and will comply with the permit conditions if such a permit is ever needed.

20.2.3 Permits to Take Golden Eagle Nests, 50 CFR §22.25

Persons desiring to take golden eagle nests during a resource-development or recovery operation must file a permit application in accordance with prescribed procedures. The nests may be taken only when they are inactive.

At present, no golden eagles are nesting on the WIPP site. If it becomes necessary to move or remove a golden eagle nest, a permit application will be filed. All permit conditions will be met, and the nest(s) will be moved only when inactive.

21.0 MIGRATORY BIRD TREATY ACT

21.1 Summary of the Law

The Migratory Bird Treaty Act (16 U.S.C. §§703 through 712) is intended to protect birds that have common migratory flyways between the United States and Canada, Mexico, Japan, and Russia. The act makes it unlawful "at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, or attempt to take, capture, or kill . . . any migratory bird, any part, nest, or eggs of any such bird" unless specifically authorized by the Secretary of the Interior by direction or through regulations permitting and governing these actions. Although WIPP is not located within a major migration corridor, there is the potential for migratory birds to be present on WIPP lands.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The regulations in 50 CFR Part 13, "General Permit Procedures," provide uniform rules, conditions, and procedures for the application for and the issuance, denial, suspension, revocation, and general administration of all permits issued pursuant to 50 CFR Subchapter B. The provisions in this part are in addition to other regulations, including 50 CFR Parts 17, 21, and 22, and apply to all permits issued under these regulations.

The regulations of 50 CFR Part 17, "Endangered and Threatened Wildlife and Plants," also implement the Migratory Bird Treaty Act and could apply to WIPP because of the potential for the presence of migratory endangered and threatened species of birds at WIPP. These regulations, discussed in Chapter 22.0 herein, outline the requirements for permits for activities involving endangered wildlife and identify those species of wildlife which are recognized as endangered or threatened with extinction.

Under the Migratory Bird Treaty Act, the CBFO is required to consult annually with the U.S. Fish and Wildlife Service (FWS) with respect to impacts on migratory game birds² and crows resulting from the hunting activities permitted on WIPP lands. Hunting privileges for the public within the withdrawal area will continue, except for the areas that are posted against trespass. These hunting activities, whether conducted out of or within the withdrawal area, are subject to regulations implementing the Migratory Bird Treaty Act (i.e., 50 CFR Part 20, "Migratory Bird Hunting"²), which regulate the harvest of migratory birds by specifying the mode of harvest, hunting seasons, possession limits, and so on. Furthermore, because certain migratory birds that have been federally recognized and listed as endangered or threatened, such as bald eagles and peregrine falcons, could be present on WIPP lands, the Bald and Golden Eagle Protection Act (Chapter 20.0 herein) and the Endangered Species Act (Chapter 22.0 herein) may also apply, along with their implementing regulations.

The regulations in 50 CFR Part 21, "Migratory Bird Permits," supplement the general permit regulations of Part 13 of this subchapter with respect to permits for the taking, possession, transportation, sale, purchase, barter, importation, exportation, and banding or marking of migratory birds. The portion that is relevant to WIPP is 50 CFR §21.22, which outlines the requirements and procedures for obtaining permits to band or mark birds. Part 21 also provides certain exceptions to the permit requirements for public, scientific, or educational institutions and establishes depredation orders that provide limited exceptions to the Migratory Bird Treaty Act.

The purpose of the regulations in 50 CFR Part 22, "Eagle Permits," is to govern the taking, possession, and transportation of bald and golden eagles for scientific, educational, and depredation-control purposes and for the religious purposes of Indian tribes. Compliance with these regulations is discussed in Chapter 20.0 herein.

² Migratory game birds are migratory birds that belong to the following families: Anatidae (ducks, geese, brant, and swans); Columbidae (doves and pigeons); Gruidae (little brown cranes); Rallidae (rails, coots, and gallinules); and Scolopacidae (woodcock and snipe).

21.2 Compliance Status of the Regulatory Requirements

The compliance status of each of the applicable regulatory requirements under the Migratory Bird Treaty Act is summarized in the following text.

21.2.1 Permit Application Procedures, 50 CFR §13.11

Applicants must submit a separate application on the prescribed form for each permit and must follow the prescribed forwarding instructions.

This permit is applicable to the banding or marking of migratory birds. The prescribed information has been submitted to the FWS.

21.2.2 Information Requirements for Permit Applications, 50 CFR §13.12

Applicants must provide current information such as organizational affiliation, reason(s) for the permit application, and certification of familiarity with 50 CFR Part 13.

The prescribed permit applications and supporting information have been submitted to the FWS.

21.2.3 Display of Permit, 50 CFR §13.44

Any permit issued under 50 CFR Part 13 will be displayed for inspection upon the request of the Director, his or her agent, or any other person that relies upon the existence of the permit.

The permits are permanently displayed on the door of the freezer in which tissue samples are held at WIPP.

21.2.4 Filing of Reports, 50 CFR §13.45

Recipients of a permit may be required to file reports of the activities conducted under the permit. Any such report must be filed by March 31 for the preceding calendar year ending December 31 or for any portion of the year during which the permit was in force.

Annual reports are submitted to the FWS.

21.2.5 Maintenance of Records, 50 CFR §13.46

From the date of issuance of a permit, the recipient of the permit must maintain complete and accurate records of any taking, possession, transportation, sale, purchase, barter, exportation, or

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

importation of plants obtained from the wild or wildlife covered under the permit. The records must be kept current and must include the names and addresses of any persons involved in the transfer of the plant or wildlife as well as the date of the transaction and any other appropriate information. The records must be legible or reproducible and written in English and must be maintained for 5 years from the date of expiration of the permit.

All applicable records are held for at least five years from the date of expiration of the permit.

21.2.6 Inspection Requirement, 50 CFR §13.47

Any person holding a permit under this subpart shall allow the Director's agent to enter his or her premises at any reasonable hour to inspect any wildlife or plant held or to inspect, audit, or copy any permits, books, or records required under Subpart B.

The Director's agent has not yet requested such an inspection. Should an inspection be requested, full cooperation will be given.

21.2.7 Compliance With Permit Conditions, 50 CFR §13.48

Any person holding a permit under this subpart or acting under the authority of the permittee must comply with all conditions of the permit and with all applicable laws and regulations governing the permitted activity.

Conditions described in the permit have been met. See also Subsection 21.2.12 below.

21.2.8 Acceptance of Liability, 50 CFR §13.50

Any person holding a permit under Subpart B assumes all liability and responsibility for the conduct of any activity conducted under the authority of the permit.

The MOC personnel responsible for the management of the permits granted under Subpart B at WIPP are fully aware of their liabilities and assume responsibility for their activities.

21.2.9 Compliance With Applicable Migratory Bird Hunting Regulations, 50 CFR Part 20, Subpart C

Hunters of migratory game birds must comply with open-season requirements, including the avoidance of prohibited hunting methods.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Hunting privileges for the public will continue within the withdrawal area, except in areas posted against trespass, in accordance with applicable hunting regulations.

21.2.10 Application for Banding or Marking Permit, 50 CFR §21.22(a)

Persons intending to capture migratory birds for banding or marking must have obtained a permit acquired in accordance with prescribed permit regulations.

All appropriate permits are maintained as the need arises.

21.2.11 Additional Permit Conditions, 50 CFR §21.22(c)

In addition to the general permit conditions described in 50 CFR Part 13 [see Subsections 21.2.1 through 21.2.8 above], the following conditions will be met:

- *Only official numbered leg bands issued by the Fish and Wildlife Service will be used to band migratory birds.*
- *All traps or nets used to capture migratory birds for banding or marking will have a tag attached with the name and address of the permittee and the permit number.*
- *The holder of a permit may salvage birds killed or found dead. All such dead birds salvaged under the authority of a banding or marking permit must be donated and transferred to a public, scientific, or educational institution at least every six months or within 60 days of the expiration or revocation of the permit unless a special permit that authorizes possession for a longer period of time has been issued.*
- *The permittees must keep accurate records of their operations and must file reports as required.*

The additional permit conditions are met at WIPP.

21.2.12 Term of Permit, 50 CFR §21.22(d)

The term of a banding or marking permit shall not exceed three years from the date of issuance or renewal. The expiration date is designated on the permit unless the permit has been amended or revoked.

All appropriate permits are maintained as the need arises.

21.2.13 Special-Purpose Permits, 50 CFR §21.27

Permits may be issued for special-purpose activities related to migratory birds or their parts, nests, or eggs that are otherwise outside the scope of the standard permits of this part.

No special-purpose permits have been needed at WIPP to date. Should such a permit become necessary, all appropriate requirements will be met as specified under this section.

22.0 ENDANGERED SPECIES ACT

22.1 Summary of the Law

The Endangered Species Act (16 U.S.C. §§1531 et seq.) was enacted in 1973 to prevent the extinction of certain species of animals and plants. This act provides strong measures to help alleviate the loss of species and their habitats and places restrictions on a wide range of activities involving endangered and threatened animals and plants to help ensure their continued survival. With limited exceptions, this act prohibits activities that could potentially impact these protected species unless authorized by a permit from the FWS. Under Section 1536 of the act and the implementing regulations in 50 CFR Part 402, "Interagency Cooperation--Endangered Species Act, as Amended," the EPA is prohibited from authorizing activities likely to jeopardize the continued existence of any threatened or endangered species or its critical habitat. A biological assessment and "formal consultation," followed by the issuance of a "biological opinion" by the FWS, may be required for any species that is determined to be in potential jeopardy.

The DOE consulted with the FWS in 1979 to determine the presence of threatened or endangered species at or near the WIPP site. At that time, the FWS listed the Lee pincushion cactus (*Coryphantha sneedi* var. *Leei*), the black-footed ferret (*Mustela nigripes*), the American peregrine falcon (*Falco peregrinus anatum*), and the bald eagle (*Haliaeetus leucocephalus*) as threatened or endangered species that could exist on lands within or outlying the WIPP site. No critical habitat for endangered species was identified at WIPP. In 1989, the DOE again consulted with the FWS to update the list of threatened and endangered species. The agency has advised the DOE that the list of species provided in 1979 is still valid.

During 1989, the DOE consulted with the New Mexico Department of Game and Fish (NMDG&F) regarding the state-listed endangered species in the vicinity of WIPP. Based on NMDG&F Regulation 657, dated January 9, 1988, the NMDG&F listed seven birds and one reptile in one of two endangerment categories that occur or are likely to occur at the site.

During 1995, the FWS transmitted the April 24, 1995, updated list of threatened and endangered species (to include Notice of Review) for Eddy and Lea Counties, New Mexico. Inclusive were approximately 18 species that occur or are likely to occur

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

on WIPP lands. Accordingly, the list was distributed to pertinent WIPP departments for consideration and incorporation into applicable documents. The DOE currently operates under the assumption that activities associated with the operation of WIPP will have no impact on any threatened or endangered species. Considerations pertaining to protected species are implemented in accordance with this management plan, during the deliberation and administration of projects conducted on WIPP lands.

To ensure that WIPP environmental protection programs are current in their consideration of sensitive and protected species, the Waste Isolation Pilot Plant Threatened and Endangered Species Survey (DOE, 1996b) was conducted from August to November 1996. No threatened or endangered species were found within the WIPP LWA boundaries during the 1996 survey.

The regulations in 50 CFR Part 13, "General Permit Procedures," provide uniform rules, conditions, and procedures for the application for and the issuance, denial, suspension, revocation, and general administration of all permits issued pursuant to 50 CFR Subchapter B. The provisions in this part are in addition to other regulations and apply to all permits issued under them, including 50 CFR Parts 17, 21, and 22.

The regulations of 50 CFR Part 17, "Endangered and Threatened Wildlife and Plants," implement the Endangered Species Act (Chapter 22.0) as well as the Bald and Golden Eagle Protection Act (Chapter 20.0) and could apply to WIPP because of the potential for the presence of the endangered animal and plant species identified above. The regulations in this part outline the requirements for permits for activities involving endangered wildlife and identify those species of wildlife and plants recognized as endangered or threatened with extinction.

Other federal regulations which implement the Endangered Species Act and which apply to WIPP include the implementing regulations in 50 CFR Parts 21 and 22. The purpose of the regulations in 50 CFR Part 21, "Migratory Bird Permits," is to supplement the general permit regulations of Part 13 of Subchapter B with respect to permits for the taking, possession, transportation, sale, purchase, barter, importation, exportation, and banding or marking of migratory birds, including those listed as threatened or endangered. Compliance with these regulations is discussed in Chapter 21.0 herein.

The regulations in 50 CFR Part 22, "Eagle Permits," govern the taking, possession, and transportation of the endangered bald eagle for scientific, educational, and depredation-control purposes and for the religious purposes of Indian tribes. Requirements under these regulations are discussed in Chapter 20.0 herein.

22.2 Compliance Status of the Regulatory Requirements

No activities involving endangered species are conducted at WIPP. No permits, biological assessments, or formal consultations are required.

23.0 NATIONAL HISTORIC PRESERVATION ACT

23.1 Summary of the Law

The National Historic Preservation Act (NHPA) (16 U.S.C. §§470 et seq.) was enacted to protect the nation's cultural resources in conjunction with the states, local governments, Indian tribes, and private organizations and individuals. It is the policy of the federal government to (1) use measures, including financial and technical assistance, to foster conditions under which our modern society and our prehistoric and historic resources can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations; (2) provide leadership in the preservation of the prehistoric and historic resources of the United States and of the international community of nations and in the administration of the national preservation program in partnership with states, Indian tribes, Native Hawaiians, and local governments; (3) administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations; (4) contribute to the preservation of nonfederally owned prehistoric and historic resources and give maximum encouragement to organizations and individuals undertaking preservation by private means; (5) encourage the public and private preservation and utilization of all usable elements of the Nation's historic built environment; and (6) assist state and local governments, Indian tribes, and Native Hawaiian organizations and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities. The act also established the National Register of Historic Places (National Register). At the state level, the State Historic Preservation Officer (SHPO) coordinates the state's participation in implementing the NHPA. The NHPA was last amended in 2000.

Section 106 of NHPA requires that a federal agency head who has jurisdiction over a federal, federally assisted, or federally licensed undertaking take into account the effects of the agency's undertaking on historic properties included in or eligible for the National Register. The "Section 106 process" requires that the federal agency head afford the Advisory Council on Historic Preservation (the Council) a reasonable opportunity to comment on the undertaking prior to initiating the undertaking. Through the Section 106 process, the Council seeks to accommodate historic preservation concerns with the needs of federal undertakings. The Council encourages this accommodation through consultation among the federal agency, the SHPO, and other interested parties during the early stages of planning.

The NHPA's implementing regulations in 36 CFR Part 800, "Protection of Historic and Cultural Properties," contain provisions for the development of a treatment plan by a federal agency that identifies historic properties likely to be discovered during the implementation of an undertaking and how they will be managed.

Since 1976, cultural resource investigations have recorded 60 archaeological sites and 91 isolated occurrences within the 16-square-mile WIPP site boundary. The exact

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

number of sites within the WIPP site boundary was confirmed with the completion of a comprehensive archaeological database created in July 1994.

In 1997, the CBFO officially entered into a Joint Powers Agreement with agencies from the state of New Mexico. One of the participating agencies is the SHPO. Commitments by both respective agencies are established in the agreement with regard to notification time lines. In addition, the agreement reiterates the CBFO obligation to manage cultural resources in accordance with Sections 106 and 110 of the National Historic Preservation Act, the Archaeological Resource Protection Act, Native American Graves Protection and Repatriation Act, and applicable DOE orders.

23.2 Compliance Status of the Regulatory Requirements

The text summarizes the regulatory requirements and their compliance status under the NHPA.

23.2.1 Assessment of Effects on Historic Properties, 36 CFR §800.5

In consultation with the SHPO, the federal agency official with jurisdiction over an undertaking is responsible for assessing the effect of an undertaking on affected historic properties, obtaining the SHPO's concurrence when the effect is not considered adverse, and notifying and submitting summary documentation to the Council.

The CBFO submitted documentation to the New Mexico SHPO describing excavation activities and the avoidance of any potential historical sites. A determination of No Adverse Effect from WIPP activities on historic properties was made by the SHPO in May 1980. This determination was applicable for the primary construction activities associated with the development of WIPP. Similar documentation was submitted to the Council. Since the 1980 determination, the CBFO has evaluated minor construction activities in previously undisturbed areas for potential impacts to cultural resources. New surface disturbing activities are evaluated by a licensed, permitted archaeologist and approval is obtained from the SHPO prior to allowing the action to proceed.

23.2.2 Development of a Plan for the Treatment of Historical Property Discovered During a Federal Agency Undertaking, 36 CFR §800.11

After a determination by the federal agency official presiding over an undertaking that the potential for the discovery of historical property exists, the agency official may develop a plan for the treatment of such properties if discovered and include this plan in any documentation prepared to comply with 36 CFR §800.5.

The WIPP LMP outlines objectives and planned actions for the management of cultural resources within the withdrawal area.

23.2.3 Application for Permits and Information Collection, 43 CFR §7.5

Any person proposing to excavate and/or remove archaeological resources from public lands and to carry out activities associated with such excavation and/or removal shall apply for a permit for the proposed work and shall not begin the proposed work until a permit has been issued.

Avoidance of known archaeological sites is the primary mitigation measure used at WIPP. During this reporting period no archaeological sites were excavated.

24.0 NEW MEXICO ENVIRONMENTAL IMPROVEMENT ACT

24.1 Summary of the Law

The enactment of the New Mexico Environmental Improvement Act (EIA) (§§74-1-1 through 74-1-10 NMSA [New Mexico Statutes Annotated] 1978) created the Environmental Improvement Board to promulgate regulations and standards to protect health and safety and the environment. The Environmental Improvement Act also created the Environmental Improvement Division, now known as the NMED. The act directs the NMED to assume responsibility for environmental management and protection to demonstrate that environmental policy provides optimal health, safety, social, and economic well-being for the people of New Mexico. In carrying out its responsibilities, the NMED is directed to maintain, develop, and enforce regulations and standards in areas including water supply, liquid waste, air quality, radiation control, health and safety, hazardous wastes, and USTs. Many of these regulations and standards are applicable to WIPP. These include the HWA and the implementing hazardous waste management and Underground Storage Tank Regulations (USTRs), the Solid Waste Act, the Ground Water Protection Act (GWPA), the Air Quality Control Act, the Water Quality Act, and Water Supply Regulations.

24.2 Compliance Status of the Law

The DOE will continue to comply with all applicable New Mexico environmental regulations and standards as demonstrated in the following sections.

25.0 NEW MEXICO HAZARDOUS WASTE ACT

25.1 Summary of the Law

The purpose of the HWA (§§74-4-1 through 74-4-14 NMSA 1978) is to ensure the maintenance of the quality of New Mexico's environment; to confer optimal health, safety, comfort, and economic and social well being on its inhabitants; and to protect the proper utilization of its lands. The HWA established the program for hazardous waste management and control in the state of New Mexico. Since its initial enactment in 1977, it has been amended substantially several times to make its provisions more consistent with the 1980 and 1984 amendments to RCRA (see Chapter 2.0, Resource

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Conservation and Recovery and Solid Waste Disposal Act, herein). The major provisions of the HWA were taken directly from Subtitles C ("Hazardous Waste Management") and I ("Regulation of Underground Storage Tanks") of the RCRA.

On January 11, 1985, New Mexico received authorization from the EPA to administer the base federal hazardous waste program, effective January 25, 1985. Additional authorizations that expanded the scope of the initial authorization were granted by the EPA and became effective on April 10, 1990; July 25, 1990; December 4, 1992; August 23, 1994; December 21, 1994; July 10, 1995; January 2, 1996; March 10, 1997; and June 13, 1998.

On January 2, 1996, the EPA provided an additional Final Authorization of State Hazardous Waste Management Program Revisions in the state of New Mexico. With this authorization the state was provided regulatory authority to implement the 1984 HSWA. The EPA published this final authorization in accordance with the requirements of 40 CFR §271.21(b)(3). With this authorization the EPA determined that the revisions to the New Mexico hazardous waste program met the requirements of Section 3006(b) of the RCRA by demonstrating that the state program was equivalent to and consistent with the federal program, and that the state program provided adequate enforcement authority to implement the revised HSWA authority under RCRA.

Section 74-4-4.F of the HWA allows the Environmental Improvement Board to adopt federal hazardous waste management regulations by reference after public notice and public hearing. On January 11, 1991, New Mexico adopted the entire body of 40 CFR Parts 260 through 266, and 268 through 270, of the EPA's regulations implementing Subtitle C, with only a few substitutions and minor exceptions. With regard to the management of mixed waste, on July 11, 1990, the EPA published its acceptance of New Mexico's revised hazardous waste program, effective July 25, 1990. This authorization allows New Mexico to regulate the hazardous constituents of mixed waste under the revised HWA. In May of 2000, New Mexico adopted federal regulations 40 CFR Parts 260 through 273, which were effective July 1, 1999. The only exception to this authorization are regulatory changes made by the EPA subsequent to the authorization. This authorization allows the state to regulate the hazardous constituents of the mixed waste to be sent to WIPP unless changes in the federal regulations have been made and not adopted by the NMED.

On July 23, 1992, New Mexico submitted an application for additional program approvals. The EPA published an immediate final rule on October 5, 1992, in which the decision was made to grant final authorization to New Mexico for the additional program modifications. The final authorization became effective on December 4, 1992. Subsequent applications and approvals were done July 10, 1995; January 2, 1996; March 10, 1997; and June 13, 1998.

Included in this section is a brief summary of the requirements of a set of implementing regulations, adopted by the NMED, for the management of "universal waste" (40 CFR Part 273), which apply to three post-consumer use wastes. The universal waste regulations established management requirements for spent batteries, recalled

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

and unused pesticides, and mercury-containing thermostats. These regulations allow these items to be regulated as universal waste rather than hazardous waste. Under this program there is no requirement for small-quantity handlers of universal waste to notify the EPA of universal waste handling activities (40 CFR §273.12) or to track shipments of universal waste (40 CFR §273.19). In 1996, the state of New Mexico adopted these regulations into 20.4.1000 NMAC. The adoption of these regulations was documented in the *New Mexico Register*, Vol. VII, No. 23, December 14, 1996. The WIPP site is a small-quantity handler of universal waste. The MOC manages nickel-cadmium and lithium batteries at WIPP under these regulations. The WIPP facility typically does not generate pesticide waste and rarely generates thermostat waste. Spent lead acid batteries sent for recycling are not managed under these regulations, instead the exemption located in 40 CFR §266.80 (20.4.1.700 NMAC) is applied. Waste characterization and hazardous waste determinations have been completed for spent lead acid batteries as required by 40 CFR Part 261 and §262.11. Universal waste regulations for used lamps have been adopted by the EPA, but not incorporated by the NMED. However, through a letter from the NMED (Brinkerhoff to Rodriguez, August 3, 2000), the MOC was given permission to manage used lamps under the universal waste regulations contained in 40 CFR Part 273.

Regulations were promulgated with respect to organic emissions from containers, tanks, and surface impoundments. These regulations are found in 40 CFR Subpart CC, "Air Emission Standards for Tanks, Surface Impoundments, and Containers." Implementation of these regulations is required in the less-than-90-day accumulation area per 40 CFR §262.34(a)(1)(i). Implementation is not required in WIPP SAAs per 40 CFR §262.34(c)(1). In accordance with 40 CFR §265.1087, "Container Level 1 Controls" are implemented by using only DOT-approved containers for storing all organic waste in the 90-day accumulation area at WIPP. The size of containers used for storing organic waste at WIPP is limited to 0.46m^3. The MOC keeps containers appropriately closed in accordance with 40 CFR §265.173 and 40 CFR §265.1087(c)(3). During the reporting period, organic waste was stored only in Level 1, DOT-approved containers.

The state's Hazardous Waste Management Regulations are applicable to WIPP in three different areas. First, WIPP personnel generate hazardous waste and are thus required to comply with the generator requirements of 40 CFR Part 262 (20.4.1.300 NMAC). As long as site generated hazardous wastes are sent to a permitted off-site TSD within 90 days, no permit is required for the accumulation and storage of hazardous wastes. Second, the DOE has entered into various contracts for transport of TRU mixed waste to WIPP. The contractors must comply with the transporter standards of 40 CFR Part 263 (20.4.1.400 NMAC). Third, WIPP is a disposal and storage facility for TRU mixed waste, which required WIPP to obtain a hazardous waste facility operating permit. The HWFP was issued by the NMED on October 27, 1999. Underground storage tanks are regulated under the New Mexico USTRs, codified as 20.5 NMAC.

The New Mexico USTRs differ somewhat from the federal regulations specified in 40 CFR Part 280. These state regulations are also discussed in detail in this section (see Subsection 25.2.6 below). The UST section includes the results of the

environmental compliance assessment that was performed for the UST program at WIPP.

25.2 Compliance Status of Regulatory Requirements

25.2.1 Compliance With Standards Applicable to Generators of Hazardous Waste, 20.4.1.300 NMAC

The following summarizes the applicable regulatory requirements and compliance status for hazardous waste generators under 20.4.1.300 NMAC, which corresponds to the federal implementing regulations of 40 CFR Part 262. Because New Mexico adopts the federal implementing regulations by reference, the citations given are from the federal regulations (40 CFR Part 262). The compliance status of WIPP to each requirement of 20.4.1.300 NMAC is summarized in the text.

25.2.1.1 Hazardous Waste Determination, 40 CFR §262.11 (20.4.1.300 NMAC)

The generator of solid waste is required to determine whether the waste is hazardous as defined under 40 CFR Part 261.

Hazardous waste is currently generated from maintenance, construction, and laboratory operations at WIPP. This waste is characterized through knowledge of the materials and processes that generated the waste and/or waste sampling and analysis.

25.2.1.2 EPA Identification Number, 40 CFR §262.12 (20.4.1.300 NMAC)

An EPA identification number is required for each generator of hazardous waste. In addition, a generator must not offer waste to transporters or TDSFs that have not received an EPA identification number.

The DOE has obtained a generator identification number for WIPP. The EPA identification number for WIPP is NM4890139088.

The MOC does not use transporters or TSD facilities that do not have an EPA identification number.

25.2.1.3 Manifest Requirements, 40 CFR §262.20 (20.4.1.300 NMAC)

Compliance with the manifest requirements is mandatory for shipping hazardous waste off-site.

The MOC uses manifests for shipping hazardous wastes to off-site facilities.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.1.4 Acquisition of Manifests, 40 CFR §262.21 (20.4.1.300 NMAC)

The generator must obtain a manifest from the appropriate source.

Section 20.4.1.300 NMAC does not require the use of a specific manifest. The MOC obtains a manifest from consignment states which require a specific manifest. If the consignment state does not require a specific manifest, a Uniform Hazardous Waste Manifest is used. The current revision of EPA Form 8700-22A is used at WIPP.

25.2.1.5 Number of Copies, 40 CFR §262.22 (20.4.1.300 NMAC)

The manifest shall consist of sufficient copies to provide two for the generator and one each for the transporter and owner or operator of the designated facility.

The manifests used at WIPP contain the required number of copies to fulfill this requirement. The Uniform Hazardous Waste Manifest form currently used contains six copies.

25.2.1.6 Use of the Manifest, 40 CFR §262.23 (20.4.1.300 NMAC)

The generator must sign the manifest certification by hand, obtain the handwritten signature of the initial transporter and date of acceptance on the manifest, and retain one copy. The generator must give the transporter the remaining copies of the manifest. Other requirements of this regulation pertain to shipments by water, rail, or to a designated facility in an authorized state which has not yet obtained authorization to regulate that particular waste as hazardous.

The MOC hazardous waste management and transportation procedures ensure that these requirements are met. Hazardous waste generated at WIPP is sent to TSDFs in states authorized to regulate that particular hazardous waste.

25.2.1.7 Packaging Requirements, 40 CFR §262.30 (20.4.1.300 NMAC)

EPA and DOT packaging requirements must be met before shipping hazardous waste off-site.

The MOC transportation and shipping procedures address these requirements. The MOC is responsible for proper packaging of all hazardous waste shipped from the site.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.1.8 Labeling Requirements, 40 CFR §262.31 (20.4.1.300 NMAC)

DOT labeling requirements must be met before shipping hazardous waste off-site.

The MOC hazardous waste management and transportation procedures address these requirements. The MOC ensures that each package of hazardous waste is properly labeled before shipping the waste off-site.

25.2.1.9 Marking Requirements, 40 CFR §262.32 (20.4.1.300 NMAC)

DOT marking requirements must be met before shipping hazardous waste off-site.

The MOC hazardous waste management and transportation procedures address these requirements. The MOC ensures that each package of hazardous waste is properly labeled before shipping the waste off-site.

25.2.1.10 Placarding Requirements, 40 CFR §262.33 (20.4.1.300 NMAC)

DOT placarding requirements must be met before shipping hazardous waste off-site.

The MOC hazardous waste management and transportation procedures address these requirements. The MOC ensures that each shipment of hazardous waste is in accordance with the regulations.

25.2.1.11 Accumulation Time, 40 CFR §262.34(a) (20.4.1.300 NMAC)

Large-quantity generators may accumulate hazardous wastes on-site in containers for up to 90 days without a permit.

An accumulation start date is placed on each container of hazardous waste generated at WIPP at the time that waste is first added to the container or the waste exits the exclusion for SAAs described in 40 CFR §262.34(c). The MOC follows hazardous waste management, storage area inspection, and waste disposal plans and procedures to ensure that accumulation time is not exceeded.

25.2.1.12 Compliance With Subpart I of 40 CFR Part 265, 40 CFR §262.34(a)(1)(i) (20.4.1.300 NMAC)

Compliance with Subpart I of 40 CFR Part 265 is required for waste placed in containers. The requirements of this subpart pertain to the condition of containers, compatibility of waste with the containers, closing containers during storage, inspections, the location of containers holding ignitable or reactive waste, the segregation of incompatible wastes, and air emission standards.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The MOC follows hazardous waste management procedures that ensure compliance with Subpart I of 40 CFR Part 265. These procedures provide for weekly inspections of containers, including container condition, container/waste compatibility, and the segregation of incompatible wastes. The hazardous waste storage area is located more than 50 feet from the WIPP property line for compliance with the requirements for ignitable or reactive waste (40 CFR Part 265). Air emission standards are met by using only DOT-approved containers for storing all organic waste in the less-than-90-day storage area, and keeping the containers closed except for the addition or removal of waste.

25.2.1.13 Accumulation of Hazardous Wastes, 40 CFR §262.34(a)(1)(ii)
(20.4.1.300 NMAC)

Except as provided in paragraphs (d), (e), and (f) of this section, a generator may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status, provided that the waste is placed in containers, and the generator complies with Subparts AA, BB, and CC of 40 CFR Part 264.

Hazardous waste management, storage area inspection, and waste disposal plans and procedures are in place, and weekly inspections are conducted to verify that no waste is accumulated for more than 90 days. Container Level 1 controls are used to ensure compliance with Subpart CC standards (see Subsection 25.2.1.28).

25.2.1.14 Compliance With Subpart W of 40 CFR Part 264, 40 CFR §262.34(a)(1)(iii)
(20.4.1.300 NMAC)

Compliance with Subpart W of 40 CFR Part 264 for wastes placed on drip pads is required.

Drip pads are not used at WIPP for hazardous waste accumulation or storage. This requirement does not apply.

25.2.1.15 Marking With Date of Initial Accumulation, 40 CFR §262.34(a)(2)
(20.4.1.300 NMAC)

Each container of hazardous waste must be clearly marked with the date of the initial accumulation of the waste.

The accumulation date is placed on containers when waste is first added to the container or when the container exits the SAA.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

25.2.1.16 Marking as Hazardous Waste, 40 CFR §262.34(a)(3) (20.4.1.300 NMAC)

Each hazardous waste container in the less-than-90-day storage area must be labeled or marked as hazardous waste.

Each hazardous waste container in the less-than-90-day storage area is clearly labeled as a hazardous waste as described in MOC procedures. Weekly inspections are performed to ensure the proper labeling of containers.

25.2.1.17 Compliance With Emergency Response, Training, and Waste Analysis Plan Requirements, 40 CFR §262.34(a)(4) (20.4.1.300 NMAC)

Compliance with Subparts C (preparedness and prevention) and D (contingency plans and emergency procedures) of 40 CFR Part 265 and §268.7(a)(5) (waste analysis plan for prohibited waste under the land disposal restrictions) is required. In addition, the requirements of 40 CFR §§265.111 and 265.114 (closure performance standard and disposal or decontamination of equipment, structures, and soils) must be met.

The CBFO complies with this requirement through the maintenance of the RCRA Contingency Plan (Attachment F of the HWFP), the Waste Analysis Plan, various emergency response procedures, formal personnel training, and operation, maintenance, and testing of emergency equipment.

Title 40 CFR Part 265, Subpart C, Preparedness and Prevention: WIPP is maintained and operated to minimize the possibility of fire, explosions, or any unplanned release of hazardous waste to the environment. Inspections of waste handling areas and equipment are conducted periodically in accordance with applicable regulations and MOC procedures. Any corrective actions needed are initiated via spill management procedures and action requests.

Attachment E, Preparedness and Prevention, of the HWFP describes internal and external communications systems, emergency equipment, and water for fire control. It also addresses aisle space requirements; preventive procedures, structures, and equipment. Procedures are in place to ensure that ignitable, reactive, and incompatible wastes are properly segregated and to ensure that sources of ignition are not present.

The following communication and alarm systems are available at the WIPP site: one-way communication by the public address (PA) system and its intercom phones and paging channels; local and facility-wide alarm systems, pagers and plectron; and two-way communication using an intra-plant telephone system, mine phones, and portable two-way radios. Inspection procedures are in place for the communication and alarm systems and the fire protection equipment. These procedures include provisions for testing and maintenance to ensure that equipment will be operable in an emergency. Spill control and decontamination equipment is inspected weekly, and the results are recorded on inspection sheets as defined in Attachment D, Inspection Schedule,

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Process and Forms, of the HWFP. Adequate aisle space is maintained in the hazardous waste storage area at WIPP to allow for potential emergency response activities.

The WIPP Emergency Management Section provides regional ambulance and emergency medical services. In addition, the DOE has established MOUs with off-site emergency response agencies for fire fighting, medical assistance, and law enforcement. An example is the mutual aid agreement between Hobbs and the DOE that provides for mutual ambulance, medical, fire, rescue, and hazardous material response services. All outside agencies with which MOUs have been made have received copies of the RCRA Contingency Plan and the Waste Isolation Pilot Plant Emergency Management Program.

Title 40 CFR Part 264, Subpart D, Contingency Plan and Emergency Procedures:

The RCRA Contingency Plan defines responsibilities, provides guidance for the coordination of activities, and describes procedures and actions to take to minimize the threats to human health and the environment from fires, explosions, or any sudden or non-sudden release of hazardous waste or hazardous waste constituents. The plan describes actions that must be taken in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or water. The plan lists agreements with local authorities; lists names, addresses, and phone numbers of persons qualified to act as Emergency Coordinators; provides a list of emergency equipment at the facility; and includes an evacuation plan. As stated in the plan, the RCRA Emergency Coordinator has the authority to commit the resources necessary to respond to an emergency.

Copies of the plan, and all amendments, are provided to all outside agencies with which WIPP has agreements for assistance in an emergency situation. The MOC maintains the distribution list for the plan and is responsible for updating the copies.

A comprehensive review of the plan is conducted at least annually, and the plan is modified to ensure that all information is up to date. Permit modifications are submitted, if necessary, whenever applicable regulations are revised; if the plan fails in an emergency; if the facility changes in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency; or if the list of RCRA Emergency Coordinators or the list of emergency equipment changes.

A RCRA Emergency Coordinator is on-site 24 hours a day, 7 days a week. The coordinator is responsible for coordinating all emergency response measures. The primary RCRA Emergency Coordinator is the on duty Facility Shift Manager. Emergency Coordinators are thoroughly familiar with the plan. The plan has provisions that meet the emergency procedure requirements such as communication of an emergency situation to employees, notification of the appropriate agency if assistance is needed, identification of hazardous materials, assessment of hazards, and notification of any incident that requires implementation of the plan.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Title 40 CFR §264.16, Personnel Training: Formal training at WIPP is conducted in accordance with the MOC training program. Training includes General Employee Training (GET), other classroom training, and on-the-job training. Classroom training is conducted by certified instructors. Certification requirements are established in an MOC procedure. The GET course provides detailed training in such areas as communications, alarm systems, and emergency response. Section H-1b(1) of Attachment H, Personnel Training, of the HWFP requires all personnel to attend GET within 30 days of employment. All WIPP employees must take annual GET refresher training. Other classroom training is offered for personnel in selected job categories that involve the management of hazardous waste, such as maintenance and waste operations. Annual refreshers are provided. Maintenance personnel are trained to provide repair and replacement services. Inspections are a part of job-specific training and emergency response personnel training. WIPP employees involved in managing site-generated, nonradioactive waste, or TRU mixed waste will receive a hazardous waste worker course. This course provides job specific training required to safely receive, transfer, or handle waste at the facility. Review and update of the course topics are provided annually.

The MOC maintains a listing of all hazardous waste management job titles, the names of employees assigned by job title to hazardous waste management jobs, and job descriptions that identify RCRA-related duties. Records on active and inactive personnel are kept at the facility in accordance with MOC procedures.

Title 40 CFR § 265.111, 40 CFR § 265.114, Closure Performance Standard and Disposal or Decontamination of Equipment, Structures, and Soils: Through compliance with all applicable waste management regulations as discussed in this chapter, it is unlikely that hazardous waste or hazardous waste constituents will be released to the environment. All spills and releases are cleaned up immediately. The MOC will comply with the applicable closure performance standards and ensure that any contaminated equipment structures and soils are disposed of in accordance with the applicable regulations.

Title 40 CFR §268.7(a)(4), Waste Analysis for Treating Prohibited Wastes in Tanks or Containers: With the exception of allowable neutralization of acidic laboratory wastes, no WIPP-generated hazardous waste is treated or land-disposed at this facility.

25.2.1.18 Extension of Storage Period, 40 CFR §262.34(b) (20.4.1.300 NMAC)

The 90-day storage period may be extended due to unforeseen, temporary, and uncontrollable circumstances.

Applicable MOC procedures provide instruction for the shipment of hazardous waste off-site prior to the 90-day deadline. An extension of the storage period was not required during this reporting period; however, procedures exist if a request for an extension is needed.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.1.19 Restrictions and Requirements, 40 CFR §262.34(c)(1) (20.4.1.300 NMAC)

There are a number of restrictions and requirements for SAAs. These include the limit of 55 gallons of hazardous or 1 quart of acutely hazardous waste (listed in 40 CFR §261.33[e]) and the requirement that the SAA be located at or near the point of generation of the waste and under the control of the operator.

The MOC SAA management procedure addresses how inspections are conducted to verify that the 55-gallon limit per SAA is not exceeded. None of the SAAs have a capacity that exceeds 55 gallons, and no SAAs for acutely hazardous waste have been established at WIPP. The SAAs are located at or near the points of generation of the hazardous waste, and are under the control of the operator generating the waste. In addition, this procedure defines the requirements for placing waste in an SAA, and defines the responsibilities of the waste generator.

25.2.1.20 Compliance With 40 CFR §§265.171, 265.172, and 265.173(a), 40 CFR §262.34(c)(1)(i) (20.4.1.300 NMAC)

Requirements for hazardous waste generators from 40 CFR Part 265 pertain to the condition of the containers (§265.171), compatibility of the waste with the container (§265.172), and the necessity to keep the containers closed when not actually adding waste to or removing it from the containers (§265.173[a]). In addition, a container holding hazardous waste must not be opened, handled, or stored in a manner that could rupture the container or cause it to leak.

The MOC SAA procedures and weekly inspections ensure that containers used to hold hazardous waste in SAAs are in good condition. If a container is found to be damaged, it is overpacked, or the waste is removed and transferred to another container. These procedures address waste/container compatibility, and the requirement that containers be closed except when waste is being added or removed. These procedures also address the requirement that containers not be opened, handled, or stored in a manner that could cause the container to rupture or leak by requiring that containers be inspected before and after transportation from the SAA to the staging area.

25.2.1.21 Labeling of Container as "Hazardous Waste," 40 CFR §262.34(c)(1)(ii) (20.4.1.300 NMAC)

Labeling of each hazardous waste container as "hazardous waste" is required.

Applicable MOC procedures are in place, and weekly inspections are conducted to verify that each container of hazardous waste is clearly labeled as hazardous waste.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.1.22 Management of Waste, 40 CFR §262.34(c)(2) (20.4.1.300 NMAC)

If waste accumulates in one of the SAAs in excess of the 55-gallon or 1-quart limit, the container(s) containing the excess waste must be marked with the date on which excess waste began accumulating, and excess accumulation wastes must be moved to the 90-day storage area within 3 days.

There were no excess accumulations in the SAAs during this BECR reporting period. Procedures and weekly inspections ensure that all waste in an SAA is moved to the less-than-90-day storage area before excess amounts are accumulated.

25.2.1.23 Record-Keeping Requirements, 40 CFR §262.40 (20.4.1.300 NMAC)

Manifests, test results, waste analyses, biennial reports, and exception reports must be kept on-site for at least three years.

Required records are maintained by the MOC on-site for a minimum of three years. Waste analyses and reports supporting the LDRs are kept on file for a minimum of three years.

25.2.1.24 Generator-Biennial Report, 40 CFR §262.41 (20.4.1.300 NMAC)

Each generator of hazardous waste that ships the waste off-site to an approved TSDF must file a report to the EPA by March 1 of every even-numbered year. This report is required to contain a description of the efforts undertaken during the year to reduce the volume and toxicity of the waste and a comparison of the volume and toxicity of the waste to previous years.

The MOC prepares this report to respond to these requirements. The most recent report was submitted in February 2002.

25.2.1.25 Exception Reporting, 40 CFR §262.42 (20.4.1.300 NMAC)

Exception reporting is required if a copy of the manifest is not returned to the generator within 45 days of the date of acceptance of the hazardous waste by the transporter.

The MOC hazardous waste management procedures address exception reporting. No exception reports were required during this reporting period.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.1.26 Additional Reporting, 40 CFR §262.43 (20.4.1.300 NMAC)

The Secretary, as he or she deems necessary, may require generators to furnish additional reports concerning the quantities and disposition of wastes identified or listed in 40 CFR Part 261.

No additional reports have been requested to date.

25.2.1.27 Special Requirements for Generators of Between 100 and 1,000 Kilograms Per Month, 40 CFR §262.44 (20.4.1.300 NMAC)

A generator of greater than 100 kilograms but less than 1000 kilograms of hazardous waste in a calendar month is subject to only . . . record keeping; . . . exception reporting; and . . . additional reporting.

The WIPP site is currently categorized as a large quantity generator (over 1,000 kilograms in any calendar month). This regulation is not applicable.

25.2.1.28 Container Level 1 Standards 40 CFR §265.1087(c) (20.4.1.500 NMAC)

When a defect is detected for the container, cover, or closure devices, the owner or operator shall make first efforts at repair of the defect no later than 24 hours after detection and repair shall be completed as soon as possible but no later than five calendar days after detection. If repair of a defect cannot be completed within five calendar days, then the hazardous waste shall be removed from the container and the container shall not be used to manage hazardous waste until the defect is repaired.

If the contents of a leaking container cannot be immediately transferred to a nondefective container, MOC personnel will temporarily plug or patch the leak as soon as it is detected. As soon as possible after a container defect is detected, but no later than the end of the work shift, MOC personnel transfer hazardous waste into a nondefective container. Empty, defective containers are crushed and sent to a scrap metal recycler. Repaired containers are not used at WIPP.

25.2.2 Compliance With Standards Applicable to Transporters of Hazardous Waste, 40 CFR Part 263 (20.4.1.400 NMAC)

The DOE and its MOC conduct assessments or audits to review WIPP compliance with requirements of applicable federal regulations, DOE orders, and DOE Albuquerque Operations Office (AL) Directives that pertain to hazardous waste transportation activities.

A summary of the requirements for transporters of hazardous or mixed wastes and the compliance status of each requirement is provided in the text.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.2.1 Compliance With Department of Transportation Regulations, 40 CFR §263.10(a) (20.4.1.400 NMAC)

Transporters of hazardous/mixed waste must comply with all applicable DOT regulations.

Cast Transportation, Inc., and Tri-State Motor Transport have been contracted to transport TRU waste to WIPP from the generator sites. The CBFO transportation management plans incorporate the applicable DOT regulations from the 49 CFR.

Any transporter hired to ship TRU and TRU mixed waste from the generator sites to WIPP must comply with the DOT regulations.

25.2.2.2 EPA Identification Number, 40 CFR §263.11 (20.4.1.400 NMAC)

The transporter must have an EPA identification number from the EPA Administrator.

Cast Transportation Inc., and Tri-State Motor Transport have been contracted to transport TRU and TRU mixed waste from the generator sites to WIPP. Cast Transportation Inc.'s EPA identification number is COR 000005389. Tri-State Motor Transport's EPA identification number is MOD 095038998. Any transporter hired to ship TRU and TRU mixed waste to WIPP must have an EPA identification number.

25.2.2.3 Compliance With the Manifest System and With Record-Keeping Requirements, 40 CFR §§263.20 Through 263.22 (20.4.1.400 NMAC)

The transporter must comply with all relevant manifest and record-keeping requirements.

The CBFO transportation management plans indicate that the transporters will comply with requirements of the manifest system. Any transporter hired to ship TRU mixed waste to WIPP must comply with these requirements. Applicable records are maintained by both the CBFO and the MOC.

25.2.2.4 Immediate Action after Hazardous Waste Discharges, 40 CFR §263.30 (20.4.1.400 NMAC)

The transporter will take appropriate immediate action in the event of a discharge of hazardous waste during transportation.

The CBFO transportation management plans address actions that will be undertaken to protect human health and the environment. Any transporter that ships TRU mixed waste to WIPP must have these capabilities. No hazardous waste discharges have occurred during this reporting period.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

25.2.2.5 Discharge Cleanup, 40 CFR §263.31 (20.4.1.400 NMAC)

A transporter must clean up any hazardous waste discharge that occurs during transportation or must take any action(s) required by federal, state, or local officials to render the discharge nonhazardous to human health and the environment.

In the event of a hazardous waste constituent discharge during transportation, cleanup activities will be undertaken, as required. Any transporter of TRU waste to WIPP must be capable of ensuring adequate cleanup of any hazardous or mixed waste released to the environment during a transportation incident or accident. No waste discharges have occurred.

25.2.3 Compliance With the Regulatory Requirements for TSDFs, 40 CFR Part 264 (20.4.1.500 NMAC)

An operating permit for WIPP was issued on October 27, 1999. Applicable requirements of a permitted RCRA disposal facility are described in this section.

25.2.3.1 Applicability, 40 CFR §264.10 (20.4.1.500 NMAC)

The regulations in Subpart B apply to owners and operators of all hazardous waste facilities, except as §264.1 provides otherwise.

The portions of Subpart B applicable to WIPP are identified in §§264.11 through 264.18 as discussed in Subsections 25.2.3.2 through 25.2.3.9 below.

25.2.3.2 EPA Identification Number, 40 CFR §264.11 (20.4.1.500 NMAC)

Each TSDF must have an EPA identification number.

The EPA identification number for WIPP is NM4890139088-TSDF.

25.2.3.3 Required Notices, 40 CFR §264.12(b) (20.4.1.500 NMAC)

The owner or operator of a facility that receives waste from an off-site source must inform the generator that the appropriate permits are in place and the waste will be accepted.

On January 12, 2000, the DOE CBFO sent notification to all applicable generators that a permit had been received. The DOE retains a copy of the notification in the operating record, as required by Condition II.B.2, Required Notification to Off-Site Sources, of the HWFP.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.4 General Waste Analysis, 40 CFR §264.13 (20.4.1.500 NMAC)

A detailed chemical and physical analysis of a representative sample of the wastes is required before a TSDF may treat, store, or dispose of waste. The owner/operator of the TSDF must inspect and, if necessary, analyze the waste received to ensure that it matches the identity of the waste described in the accompanying manifest. The owner/operator must follow a written waste analysis plan to ensure compliance with these requirements.

General waste analysis is addressed in Module II, General Facility Conditions, and Attachments B, Waste Analysis Plan; B1, Waste Characterization Sampling Methods; B2, Statistical Methods Used in Sampling and Analysis; B3, Quality Assurance Objectives and Data Validation Techniques for Waste Characterization Analytical Methods; B4, TRU Mixed Waste Characterization Using Acceptable Knowledge; B5, Quality Assurance Project Plan Requirements; and B6, Waste Isolation Pilot Plant Permittees' Audit and Surveillance Program, of the HWFP. Characterization methods consist of acceptable knowledge; visual examination; radiography; headspace gas sampling and analysis; and additional sampling and analysis for homogeneous solids, soil, and gravel waste forms.

25.2.3.5 Security, 40 CFR §264.14 (20.4.1.500 NMAC)

Security measures are required to prevent the possibility of unknowing and/or unauthorized entry by persons or livestock onto the active portion of the facility. A 24-hour surveillance system or barrier is required, and the facility must be posted.

Security requirements are contained in Attachment C, Security, of the HWFP. The WIPP Property Protection Area is enclosed within an 8-foot-high chain-link fence, and 24-hour surveillance is conducted by guards trained to prevent unauthorized entry onto the facility. Signs with the legend "Danger—Unauthorized Personnel Keep Out" in both English and Spanish are posted. The perimeter fence, gates, and signs are inspected daily for evidence of tampering or structural damage in accordance with WIPP approved procedures.

25.2.3.6 General Inspection Requirements, 40 CFR §264.15 (20.4.1.500 NMAC)

The owner/operator must inspect the facility for malfunctions, deterioration, operator errors, and discharges that cause actual or potential releases of hazardous constituents to the environment or a threat to human health. A written schedule must be developed and followed for inspecting all monitoring, safety, and emergency equipment; security devices; and operating/structural equipment needed to prevent, detect, or respond to environmental or human

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

health hazards. The inspections must be recorded in an inspection log or summary and kept for at least three years.

The MOC implements inspection procedures for all monitoring, safety, and emergency equipment; security devices; and operating and structural equipment. Written schedules (Attachments D of the HWFP) that indicate the frequency of routine inspections have been developed.

Cognizant individuals develop procedures that outline the types of problems that will be examined during inspections of equipment and systems and each organization responsible for inspections maintains its own inspection information. Completed inspection sheets include a signature, date and time of inspection; observations made; and the date and nature of any repairs or other remedial actions. Inspection documentation is maintained in the operating record for at least three years.

25.2.3.7 Personnel Training, 40 CFR §264.16 (20.4.1.500 NMAC)

Personnel training must be provided to facility personnel within six months of their employment or new assignment; personnel must not work in unsupervised positions until the training has been completed. The training program must be designed to ensure that facility personnel can respond effectively to an emergency. The training program must teach personnel those hazardous waste management procedures that are relevant to the positions in which they are employed. The program must be directed by a person trained in hazardous waste management procedures. The job title for each position at the facility that is related to hazardous waste management, the name of the employee filling the position, a written description of the training required, and records that document that the training and/or job experience has been completed are also required. These records must be kept until closure for current personnel and for at least three years for former employees.

Training requirements are specified in Attachments H; H1, RCRA Hazardous Waste Management Job Titles and Descriptions; and H2, Training Course and Qualification/Certification Card Outlines, of the HWFP. Formal training is conducted in accordance with a training manual. The training includes GET for all WIPP employees, other classroom training, and on-the-job training. WIPP training is directed by certified instructors.

GET provides training in such areas as communications, alarm systems, and emergency response. An MOC procedure requires all personnel to attend GET within 30 days of employment. Personnel are required to take GET refresher annually. Other classroom training is offered for personnel in certain job categories. Annual refresher courses are provided. Maintenance personnel are trained to provide repair and replacement services. Inspections are a part of job-specific training and emergency

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

response personnel training. WIPP employees involved in managing site-generated, nonradioactive waste, or TRU mixed waste receive the Hazardous Waste Worker course. This course provides job specific training required to safely receive, transfer or handle waste at the facility. Review and update of the Hazardous Waste Worker topics are provided annually.

The MOC maintains a listing of all hazardous waste management job titles, names of employees assigned by job title to hazardous waste management jobs, and job descriptions that identify RCRA duties. Records on active and inactive personnel are kept at the WIPP facility for the specified time periods.

25.2.3.8 General Requirements for Ignitable, Reactive, or Incompatible Wastes, 40 CFR §264.17 (20.4.1.500 NMAC)

Precautions must be taken to prevent accidental ignition or reaction of ignitable or reactive waste. Any mixture or commingling of incompatible wastes must be conducted so that it does not generate extreme heat or pressure, fire or explosion, violent reaction; does not produce uncontrolled toxic airborne materials; does not produce uncontrolled flammable fumes or gases; does not damage the structural integrity of the device or facility; or does not threaten human health or the environment.

WIPP is precluded from accepting ignitable, corrosive, or reactive waste as specified in Module II and Attachment B1 of the HWFP. In the analysis of the compatibility of the waste categories with each other and with waste containers, backfill, and other facility materials, no incompatibilities were identified.

25.2.3.9 Location Standards, 40 CFR §264.18 (20.4.1.500 NMAC)

Facilities where disposal of hazardous waste will be conducted must not be located near a fault as listed in 40 CFR §270.14(b)(11). Facilities in a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout by a 100-year flood. No noncontainerized or bulk liquid hazardous waste may be emplaced in such structures as a salt-bed formation or an underground mine except at the DOE Waste Isolation Pilot Plant in New Mexico.

Eddy County is not listed as a political jurisdiction in which compliance with 40 CFR §264.18(a) must be demonstrated. It can be assumed that the WIPP facility is in compliance with this requirement. Attachment E of the HWFP states that the WIPP site does not lie within a 100-year floodplain. There are no requirements for flood-protection. Drainage and diversion structures have been constructed such that surface and subsurface structures will not be affected by a probable maximum precipitation event. WIPP is specifically identified in the regulation as the only facility of this type that may be used for the placement of hazardous waste.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.10 Maintenance and Operation of Facility, 40 CFR §264.31 (20.4.1.500 NMAC)

Facilities must be designed, constructed, maintained, and operated to minimize the possibility of fire, explosions, or any unplanned release of hazardous constituents to air, soil, or surface water that could threaten human health or the environment.

All waste handling facilities are designed, constructed, maintained, and operated so as to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents which could threaten human health or the environment. General facility conditions for maintenance and operation of WIPP are stated in Module II of the HWFP. Preventive procedures, structures, and equipment are specified in Attachment E of the HWFP. An inspection schedule for equipment instrumental in preventing, detecting, or responding to environmental or human health hazards is given in Attachment D of the HWFP.

25.2.3.11 Required Equipment, 40 CFR §264.32 (20.4.1.500 NMAC)

All facilities must be equipped with an internal communications or alarm system for immediate emergency instruction; devices to summon external emergency assistance; fire extinguishers and fire-control, spill-control, and decontamination equipment; and water or foam equipment, sprinklers, or water-spray systems.

The intraplant communication systems, designed to provide immediate emergency instructions to facility personnel, include communication by the PA system and its intercom phones and paging channels, an intraplant telephone system, mine phones, pagers and plectron, portable two-way radios, and local and facility-wide alarm systems. The procedures for notifying facility personnel of an emergency are described in the RCRA Contingency Plan.

There are various alarm systems used at the WIPP facility. The PA system has two alarm tones in use, a yelp and a gong. Its signals are produced in the master PA system console by a tone generator and are transmitted sitewide over the paging channel of the system, overriding its normal use.

Whenever TRU mixed wastes are handled, two persons, at a minimum, are involved in the operation. The Waste Handling Building contains readily accessible telephones and PA stations throughout. The mine phones are the main means of communication underground, although the PA system is also available.

Underground communication and alarm systems are arranged to meet the requirements of 30 CFR §57.4360, which regulates the operation of underground mines and is imposed by the Mine Safety and Health Administration. Telephones or other two-way communication equipment with instructions for their use are provided for communications from underground to the surface. Alarm systems capable of promptly warning

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

every person underground are provided and maintained in operating condition. If persons are assigned to work areas beyond the warning capabilities of the system, provisions will be made to alert them in a proper manner to provide for their safe evacuation. Typically, these provisions include a flashing light capable of being easily seen.

The external communication systems, designed to provide two-way communication with outside agencies or for summoning emergency assistance from off-site, include the commercial telephone system and two-way radios.

Attachment E of the HWFP specifies preventive procedures, structures, and equipment. The RCRA Contingency Plan describes the capabilities and locations of the fire-suppression equipment and systems.

The primary function of the WIPP facility water system is to supply water for domestic use and fire protection. Water is furnished by the Double Eagle Water Company, owned by the city of Carlsbad.

At the WIPP facility, the water enters a pair of 180,000-gallon, aboveground storage tanks located adjacent to the pump house. These tanks are 32 feet in diameter and are constructed of welded steel. Of the 360,000-gallon total capacity, at least 100,000 gallons are dedicated to fire suppression and are sufficient to handle the maximum credible fire. Separate sets of pumps for the domestic water and fire-water systems are provided in the pump house.

25.2.3.12 Testing and Maintenance of Equipment, 40 CFR §264.33
(20.4.1.500 NMAC)

All facility communications or alarm systems and fire-control, spill-control, and decontamination equipment must be tested and maintained as needed to ensure its proper operation during an emergency.

Equipment instrumental in preventing, detecting, or responding to environmental or human health hazards, such as alarm systems, fire protection equipment, and decontamination equipment are tested and maintained to assure its proper operation in a time of emergency. Alarms, spill control, and decontamination equipment are inspected weekly and the results recorded on an inspection form as defined in Attachment D of the HWFP.

25.2.3.13 Access to Communications or Alarm Systems, 40 CFR §264.34
(20.4.1.500 NMAC)

Immediate access to a communications or internal alarm system is required for all personnel involved when handling hazardous waste. If just one employee is ever on the premises during

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

operations, he or she must have immediate access to a device (e.g., telephone) for summoning external emergency assistance.

The following communication and alarm systems are available at the WIPP site: the PA system and its intercom phones and paging channels, an intra-plant telephone system, mine phones, local and facility-wide alarm systems, pagers and plectron, and portable two-way radios. Attachment E of the HWFP specifies preventive procedures, structures, and equipment. Attachment D of the HWFP provides an inspection schedule for this equipment and describes the location of alarms, telephones, etc. Alarms and telephones are strategically placed in and adjacent to hazardous and TRU waste management facilities. There is more than one employee at the site at all times.

25.2.3.14 Required Aisle Space, 40 CFR §264.35 (20.4.1.500 NMAC)

Aisle space must be maintained to allow the unobstructed movement of personnel and of fire-protection, spill-control, and decontamination equipment to any area of facility operation unless aisle space is not needed for these purposes.

Module III, Container Storage; Attachment E of the HWFP; and MOC procedures, call for maintaining appropriate aisle space for all stored waste in the Waste Handling Building. Painted lines are provided in the Waste Handling Building to assure that proper aisle space is maintained.

No aisle spacing is required to be maintained between containers emplaced in the Hazardous Waste Disposal Units (HWDUs) as per Attachment M2, Geologic Repository, of the HWFP.

25.2.3.15 Arrangements With Local Authorities, 40 CFR §264.37 (20.4.1.500 NMAC)

Arrangements with local authorities must be made for the provision of emergency services if needed. Requirements include familiarizing the local authorities with the layout of the facility, properties of hazardous waste to be handled, possible evacuation routes, and other information needed for emergency responses.

The RCRA Contingency Plan addresses this requirement. The DOE has established MOUs with appropriate off-site emergency response agencies for fire fighting, medical assistance, and law enforcement. Examples include an MOU with the Carlsbad Medical Center Emergency Radiological Treatment Center for WIPP, which provides for the treatment of radiologically contaminated personnel, and a mutual aid agreement between Hobbs and the DOE, which provides for mutual ambulance, medical, fire, rescue, and hazardous material response services. Outside agencies with which MOUs have been made have received copies of the RCRA Contingency Plan and the WIPP Emergency Management Program.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.16 Purpose and Implementation of the Contingency Plan, 40 CFR §264.51 (20.4.1.500 NMAC)

Each owner/operator must have a contingency plan for his or her TSDF. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or unplanned releases of hazardous waste or hazardous constituents to the environment. The provisions of the plan must be carried out whenever a fire, explosion, or release of hazardous waste or hazardous constituents could threaten human health or the environment.

The RCRA Contingency Plan defines responsibilities; provides guidance for coordination of activities; and minimizes hazards to human health and the environment from fires, explosions, or any unplanned release of hazardous waste or hazardous waste constituents.

25.2.3.17 Content of the Contingency Plan, 40 CFR §264.52 (20.4.1.500 NMAC)

The contingency plan must describe the actions to be taken by facility personnel in response to fires, explosions, or any unplanned releases of hazardous waste or hazardous constituents to the environment. The plan must describe arrangements agreed to by local authorities and emergency response units and must list the current names, addresses, and phone numbers (work and home) of all Emergency Coordinators. All emergency equipment must be listed, along with the location, description, and capabilities of all equipment. An evacuation plan for facility personnel must be included.

The RCRA Contingency Plan describes actions that must be taken in response to fires, explosions, or any unplanned or sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or water, and describes agreements with local authorities. It also lists the names, addresses, and phone numbers of persons qualified to act as Emergency Coordinators, provides a list of emergency equipment at the facility, and includes an evacuation plan.

The RCRA Contingency Plan also describes the agreements between WIPP and local police and fire departments, hospitals, contractors, and state and local emergency response teams. An evacuation plan for WIPP personnel is also included in the RCRA Contingency Plan.

25.2.3.18 Copies of the Contingency Plan, 40 CFR §264.53 (20.4.1.500 NMAC)

Copies of the contingency plan and all revisions to the plan must be maintained at the facility and submitted to all local police and fire departments, hospitals, and state and local emergency

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

response teams that may be called upon to provide emergency services.

Copies of the RCRA Contingency Plan are maintained at WIPP. A copy of the plan is maintained at document locations accessible to emergency responders and on the WIPP network, where it is available to all WIPP personnel. The MOC maintains a distribution list for, and is responsible for submitting permit modifications to update, the plan. Copies of the plan have been provided to each outside agency with which the CBFO has agreements for assistance in an emergency situation.

25.2.3.19 Amendment of Contingency Plan, 40 CFR §264.54 (20.4.1.500 NMAC)

The contingency plan must be reviewed and immediately revised, if necessary, whenever applicable regulations are revised; the plan fails in an emergency; the facility changes in a way that increases the potential for fire, explosions, or release of hazardous waste; or the list of Emergency Coordinators or emergency equipment changes.

The RCRA Contingency Plan is reviewed, at least annually, and the HWFP is modified if necessary whenever applicable regulations are revised; the plan fails in an emergency; the facility changes in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents or changes the response necessary in an emergency; the list of Emergency Coordinators changes; or the list of emergency equipment changes.

25.2.3.20 Emergency Coordinator, 40 CFR §264.55 (20.4.1.500 NMAC)

At least one employee (on the facility premises or on call) must be designated as the Emergency Coordinator, with the responsibility for coordinating all emergency response measures. The Emergency Coordinator must be familiar with the contingency plan, all operations and activities at the facility, the location and characteristics of waste handled, location of all facility records, and the facility layout. The Emergency Coordinator must have the authority to commit the resources needed to carry out the contingency plan.

An Emergency Coordinator is on-site at the WIPP facility 24 hours a day, 7 days a week, and is responsible for coordinating all emergency response measures. The primary Emergency Coordinator is the Facility Shift Manager. The Facility Shift Manager is the coordinator who will be on duty at the time of any incident that requires implementation of the RCRA Contingency Plan.

Personnel qualified to act as the Emergency Coordinator are listed in the plan. These employees have the requisite experience and authority to perform their role as Emergency Coordinator.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.21 Emergency Procedures, 40 CFR §264.56 (20.4.1.500 NMAC)

In the event of an imminent or actual emergency situation, the Emergency Coordinator or designee must notify facility personnel via internal alarms or communications systems and must notify state or local agencies if their help is needed. A release, fire, or explosion mandates that the Emergency Coordinator obtain appropriate information, assess possible hazards, make any notifications required, prevent the spread or reoccurrence of the incident, monitor if necessary, recover waste, prevent handling of incompatible waste in the area, ensure that emergency equipment is cleaned up and fit for use after the event, and record details regarding the incident in the facility's operating record. The owner or operator must note specific information about any incident that requires the contingency plan to be implemented. This information must be recorded in the facility's operating record. A written report must be submitted to the Regional EPA office and the NMED within 15 days of the incident. The NMED and the SERC must be contacted in the event of any spill incident that may endanger human health or the environment.

WIPP Emergency Coordinators are thoroughly familiar with the RCRA Contingency Plan. The plan has provisions that meet the emergency procedure requirements, such as communicating information about the emergency to employees, notifying appropriate agencies to obtain assistance, identifying hazardous materials, assessing hazards, and making the necessary notifications. The appropriate agencies include the LEPC, the Carlsbad Police Department, the Carlsbad Fire Department, and the Eddy County Sheriff.

The Facility Shift Manager is responsible for coordinating the cleanup of spills. Disposal of the waste resulting from cleanup is the responsibility of the MOC.

All equipment used in an emergency will be thoroughly decontaminated before being placed back in service. If decontamination is not possible, equipment will be disposed of according to MOC procedures and replaced. All emergency equipment listed in the plan is kept clean and fit for its intended use.

As described in the plan, a daily log is maintained in the Central Monitoring Room at WIPP. The Facility Shift Manager signs into the log before beginning his or her duty shift. All incidents, regardless of whether or not they activate the plan, are recorded in the Central Monitoring Room log, along with routine maintenance activities.

The plan addresses the requirement that the NMED and the SERC be notified in the event of a spill that would endanger human health or the environment.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.22 Use of Manifest System, 40 CFR §264.71 (20.4.1.500 NMAC)

If a facility receives hazardous waste or hazardous constituents accompanied by a manifest, the owner or operator or designee must sign and date each copy of the manifest to certify receipt of the waste, note any significant discrepancies in the manifest, return at least one copy of the manifest to the transporter, send a copy of the manifest to the generator within 30 days, and retain a copy of the manifest for at least three years.

The MOC waste management and transportation procedures implement guidance on the proper management and retention of hazardous waste manifests. Generator sites are required to provide a manifest for shipments of TRU mixed waste.

25.2.3.23 Manifest Discrepancies, 40 CFR §264.72 (20.4.1.500 NMAC)

Manifest discrepancies are differences between the quantity or type of hazardous waste designated in the manifest and that actually received. Upon discovering a significant discrepancy, the owner or operator must try to reconcile the discrepancy with the generator or transporter. If not resolved within 15 days, the owner or operator must notify the Secretary.

The MOC waste handling and transportation procedures provide instruction and guidance for handling manifest discrepancies. The generator will be notified of all discrepancies, and the discrepancies will be recorded in the "remarks" section of the appropriate form. If the discrepancies cannot be resolved within 15 days, they will be reported in writing to the Secretary of the NMED.

25.2.3.24 Operating Record, 40 CFR §264.73 (20.4.1.500 NMAC)

The owner/operator must keep a written operating record at the facility. Information relating to the type and amount of hazardous waste, its location and quantity at each location, cross references to specific manifest documents and records and the results of waste analyses, summary reports and details of all incidents requiring implementation of the contingency plan, records and results of inspections, monitoring and analytical data and any corrective actions taken, and closure cost estimates must be included. In addition, information on the annual certification of a waste minimization program must be kept in the operating record.

Module II of the HWFP establishes, and the MOC complies with, the above requirements for maintaining the written operating record.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

25.2.3.25 Availability, Retention, and Disposition of Records, 40 CFR §264.74 (20.4.1.500 NMAC)

All records required under this part, including plans, must be retained and made available for inspection by Department designees. The retention period for all records required under this part is automatically extended during the course of any unresolved enforcement action or as requested by the Secretary. Records of waste disposal locations and quantities must be submitted to the appropriate agencies upon closure of the facility.

The HWFP establishes requirements for maintaining a written operating record. The MOC implementation includes provisions for furnishing all records upon request to the EPA and the NMED, as well as provisions for submitting a copy of waste emplacement locations and quantities to appropriate state and federal regulators. In the event of an enforcement action, records are retained for the duration of the action.

25.2.3.26 TSDf Biennial Report, 40 CFR §264.75 (20.4.1.500 NMAC)

The owner or operator of a TSDf must submit a copy of a biennial report to the Secretary by March 1 of each even-numbered year using EPA Form 8700-13B.

The MOC submits TRU mixed waste data for the TSDf biennial report to the NMED. The last biennial report was submitted in February 2002.

25.2.3.27 Unmanifested Waste Report, 40 CFR §264.76 (20.4.1.500 NMAC)

A report must be submitted to the Secretary for any hazardous waste accepted for treatment, storage, or disposal that is not accompanied by a hazardous waste manifest.

As stated in Module II.J, Manifest System, and Attachment B, of the HWFP, and in the WIPP WAC, a hazardous waste manifest shall be transmitted with each shipment of TRU mixed waste to WIPP. No mixed waste will be accepted if it is not accompanied by a hazardous waste manifest.

25.2.3.28 Additional Reports, 40 CFR §264.77 (20.4.1.500 NMAC)

Additional reports required of the owner or operator of a TSDf by the Secretary are reports relating to releases, fire, or explosions; groundwater contamination and monitoring data; facility closure; and air emissions under Subparts AA and BB of this part.

Additional reports will be submitted as specified in Module I, General Permit Conditions, of the HWFP. Whenever it becomes necessary to partially or finally close WIPP, the

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

DOE will notify the NMED, in writing, at least 60 days prior to the date on which such closure will commence, as specified by MOC procedure.

Hazardous waste is not treated, stored, or disposed of in units subject to Subparts AA and BB. No reporting is required under these subparts. Subpart CC is not applicable to units used solely for the management of mixed waste under the authority of the AEA. It is applicable only to nonmixed waste generated at WIPP.

25.2.3.29 Applicability [of the Groundwater Monitoring System], 40 CFR §264.90 (20.4.1.500 NMAC)

A groundwater monitoring system is required by the owner or operator of a surface impoundment, landfill, or land treatment facility used to manage hazardous waste. All or part of the groundwater monitoring requirements may be waived if the owner/operator can demonstrate that there is no potential for migration of liquid from the facility via the uppermost aquifer to water supply wells or to surface water. The demonstration, in writing, must be certified by a qualified geologist or geotechnical engineer.

A groundwater detection monitoring program is required by Module V, Groundwater Detection Monitoring, of the HWFP, and is incorporated into the HWFP as Attachment L. This program has been implemented.

25.2.3.30 Required Programs, 40 CFR §264.91 (20.4.1.500 NMAC)

The owner or operator must institute a detection monitoring program. The Secretary will specify in the facility permit the specific elements of the program.

The WIPP Groundwater Detection Monitoring Program Plan has been implemented through semiannual monitoring and the submittal of the required information to the NMED on biannual basis in accordance with Condition V.J.2., Submittal of Results, of the HWFP.

25.2.3.31 Groundwater Protection Standard, 40 CFR §264.92 (20.4.1.500 NMAC)

The owner or operator must comply with conditions specified in the facility permit that are designed to ensure that hazardous constituents detected in the groundwater do not exceed concentration limits under 40 CFR §264.94.

Sampling, monitoring, and analytical requirements for the Detection Monitoring Program have not detected any constituents that exceed the specified concentration limits or that indicate statistically significant evidence of contamination as outlined in Condition V.J.3., Determination or Contamination, and Attachment L of the HWFP.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.32 Hazardous Constituents, 40 CFR §264.93 (20.4.1.500 NMAC)

The Secretary will specify in the facility permit the hazardous constituents to which the groundwater protection standard applies.

The NMED has specified the target analytes for the WIPP groundwater monitoring program. These are in Module V, Table V.D, Parameter or Constituent, in the HWFP.

25.2.3.33 Concentration Limits, 40 CFR §264.94

The Secretary will specify in the facility permit concentration limits in the groundwater for hazardous constituents.

Background water quality was established as described in the Detection Monitoring Program and directed by Module V.F., Background Groundwater Quality, of the HWFP. This information was submitted to the NMED. Condition V.F.5, Determination of Background Groundwater Quality, states that the NMED will modify the HWFP to incorporate background water quality parameters (see Subsection 25.2.3.35.4 below).

25.2.3.34 Point of Compliance, 40 CFR §264.95 (20.4.1.500 NMAC)

The Secretary will specify in the facility permit the point of compliance at which the groundwater protection standard applies and at which monitoring must be conducted.

The point of compliance is specified in Module V.B, Identification of Point of Compliance, of the HWFP. The NMED established the point of compliance in Module V of the HWFP as the vertical surface at the hydraulically downgradient limit of the underground HWDUs that extends to the Culebra member of the Rustler Formation.

25.2.3.35 General Groundwater Monitoring Requirements, 40 CFR §264.97 (20.4.1.500 NMAC)

25.2.3.35.1 *The groundwater monitoring system must consist of a sufficient number of wells installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer.*

The number of wells and the well locations are identified in Module V, Table V.C.1, Well Locations, in the HWFP.

25.2.3.35.2 *The groundwater monitoring program must include consistent sampling and analysis procedures. The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents in groundwater samples.*

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The sampling and analysis procedures are addressed in Module V.E, Sampling and Analysis Procedures, and Attachment L of the HWFP.

25.2.3.35.3 *The groundwater monitoring program must include a determination of the groundwater surface elevation each time groundwater is sampled.*

Groundwater surface elevations are obtained before sampling activities occur, as specified in Module V.G., Groundwater Surface Elevation Determination, and Attachment L of the HWFP.

25.2.3.35.4 *Data on each hazardous constituent specified in the permit will be collected from background wells and wells at the compliance point. The number and kinds of samples collected to establish background shall be appropriate for the form of statistical test employed. Groundwater monitoring data, including actual levels of constituents must be maintained in the facility operating record. The Secretary will specify in the permit when the data must be submitted for review.*

Statistical procedures are specified in Attachment L of the HWFP. Groundwater monitoring results for required parameters and hazardous constituents are submitted to the NMED biannually. Monitoring data is maintained in the facility operating record in accordance with Module V of the HWFP.

25.2.3.36 Detection Monitoring Program, 40 CFR §264.98 (20.4.1.500 NMAC)

25.2.3.36.1 *The Secretary Administrator will specify the parameters or constituents to be monitored in the facility permit.*

The parameters and constituents to be monitored are listed in Table V.D. of the HWFP

25.2.3.36.2 *The Secretary will specify the frequencies for collecting samples and conducting statistical tests to determine whether there is statistically significant evidence of contamination for any parameter or hazardous constituent specified in the permit.*

The sampling frequency is specified in Condition V.E.1, Sample Collection Procedures, and in Table L-2, WIPP Groundwater Detection Monitoring Program Sample Collection and Ground-water Surface Elevation 3 Measurement Frequency 4, of the HWFP.

25.2.3.36.3 *The owner or operator must determine the groundwater flow rate and direction at least annually.*

Groundwater flow rate and direction are determined at least annually as specified in Module V.H., Groundwater Flow Determination, of the HWFP.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.36.4 *The owner or operator must determine whether there is statistically significant evidence of contamination for any chemical parameter or hazardous constituent specified in the permit.*

Statistical analysis methods are specified in the WIPP Groundwater Detection Monitoring Plan. For each sampling event, comparisons will be made between the groundwater quality and the background groundwater quality using the specified statistical methods in accordance with Module V.I., Data Evaluation, of the HWFP.

25.2.3.36.5 *If the owner or operator determines there is statistically significant evidence of contamination, additional reporting and sampling are required. In addition, a permit modification to establish a compliance monitoring program and submittal of additional information are required.*

The MOC will respond to any statistically significant contamination events as specified in the HWFP, Module V, Condition V.J.3. No statistically significant contamination has been detected to date.

25.2.3.37 Corrective Action for Solid Waste Management Units, 40 CFR §264.101

25.2.3.37.1 *Corrective action will be specified in the permit in accordance with this section and subpart S of this part. The permit will contain schedules of compliance for such corrective action (where such corrective action cannot be completed prior to issuance of the permit) and assurances of financial responsibility for completing such corrective action.*

There are 18 SWMUs identified in the Module VII, Corrective Action for Solid Waste Management Units, of the HWFP. Fifteen of the SWMUs require a RCRA Facility Investigation, while the remaining three do not. In addition there are eight Areas of Concern included in the HWFP. The investigation was completed in September 2001. A request for "No Further Action" is being prepared for submittal to the NMED.

The SWMUs and AOCs are described in the Technical Support Document (TSD), *Exclusion/Inclusion of Solid Waste Management Units and Areas of Concern, Permit Module VII Correction Action for Solid Waste Management Units* (NMED, 1999b). The permit requires submittal of a Facility Work Plan and a RCRA Facility Investigation or Sampling and Analysis Plan. The Facility Work Plan was first submitted to the NMED on February 24, 2000. Annual updates have subsequently been prepared and submitted to the NMED. The last Facility Work Plan was issued on February 13, 2002. The Sampling and Analysis Plan (in lieu of a RCRA Facility Investigation) was submitted to the NMED in May of 2000, and was approved in August of 2001. The HWFP includes the schedule for compliance in Table 1, RFI/CMS Schedule of Compliance, to Module VII.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.3.38 Applicability of the Closure/Postclosure Requirements, 40 CFR §264.110 (20.4.1.500 NMAC)

Closure requirements apply to the owners and operators of all hazardous waste facilities. Postclosure requirements apply to all hazardous waste disposal facilities.

The DOE has prepared a closure plan and a postclosure plan for WIPP. These are included in the HWFP (Attachment I, Closure Plan; and Attachment J, Post-Closure Plan).

25.2.3.39 Closure Performance Standard, 40 CFR §264.111 (20.4.1.500 NMAC)

A closure performance standard is required to minimize the need for further maintenance; to control, minimize, or eliminate the post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the environment; and to comply with the other closure requirements of this subpart.

In accordance with the Closure Plan in the HWFP, closure will be deemed complete when all hazardous waste and hazardous waste residues have been removed from the storage units, all equipment and structures associated with the operation of the units have been decontaminated, the panels and facility are closed, and unit closure certification has been submitted to and approved by the NMED.

25.2.3.40 Closure Plan; Amendment of Plan, 40 CFR §264.112 (20.4.1.500 NMAC)

The owner/operator of a hazardous or mixed-waste management facility must have a written closure plan. The plan must identify the steps necessary to perform partial and/or final closure of the facility. The plan may be amended as needed. The owner or operator must notify the Regional Director in writing prior to the date on which closure will begin.

The CBFO has prepared a written closure plan to satisfy the RCRA closure requirements. The NMED has incorporated this plan into the HWFP as the Closure Plan. The plan addresses the required steps for closure.

Should it become necessary to amend the WIPP closure plan, the DOE will submit a written notification of, or request for, a permit modification describing any change in operation, facility design, or storage/disposal designs that affect the closure plan.

25.2.3.41 Time Allowed for Closure, 40 CFR §264.113 (20.4.1.500 NMAC)

Within 90 days after receipt of the final volume of hazardous mixed waste at a hazardous waste management unit or facility,

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

the owner or operator must treat, remove, or dispose of all hazardous/mixed wastes on-site in accordance with the approved closure plan. Partial or final closure activities must be complete in accordance with the approved closure plan within 180 days of receipt of the final volume of waste. An extension of time may be allowed if the owner/operator can demonstrate that the activities required will take longer than the allotted time period and has taken and will continue to take all steps necessary to prevent threats to human health and the environment from the unclosed but nonoperational facility.

The time allowed for closure is addressed in the HWFP.

25.2.3.42 Disposal or Decontamination of Equipment, Structures, and Soils, 40 CFR §264.114 (204.1.500 NMAC)

During the partial and final closure periods, all contaminated equipment, structures, and soils must be properly disposed of or decontaminated. By removing all hazardous constituents during closure, the owner/operator may become a mixed or hazardous waste generator and must handle all such waste in accordance with the requirements of 40 CFR Part 262.

The regulatory requirements for the disposal or decontamination of equipment, structures, and soils are addressed in MOC procedures, and are broken down into four subsections. These include the removal of hazardous waste residues; the decontamination of equipment, structures, and soils; personnel decontamination; and sampling and QA.

25.2.3.43 Certification of Closure, 40 CFR §264.115 (20.4.1.500 NMAC)

Within 60 days of the completion of closure of each landfill unit and within 60 days of completion of final closure, the owner/operator must submit a certification that the hazardous or mixed waste unit has been closed in accordance with the specifications in the approved closure plan. The certification must be sent to the Secretary by registered mail and must be signed by the owner/operator and by an independent registered professional engineer.

The DOE will submit the Certification of Closure to the Secretary of the NMED within 60 days of completion of panel closure and final closure activities.

25.2.3.44 Survey Plat, 40 CFR §264.116 (20.4.1.500 NMAC)

The owner/operator must submit a survey plat to the Secretary and the authority with jurisdiction over local land use no later than

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

the submittal of the certification of closure. The survey plat must indicate the location and dimensions of landfill cells or other hazardous waste disposal units with respect to permanently surveyed benchmarks. The plat must be prepared and certified by a professional land surveyor.

The survey plat will be submitted to the NMED following closure. The survey plat will indicate the location and dimensions of HWDUs with respect to permanently surveyed benchmarks. The plat will be prepared and certified by a professional land surveyor and will contain a prominently displayed note that states the DOE's obligation to restrict disturbance of the HWDU.

25.2.3.45 Postclosure Care and Use of Property, 40 CFR §264.117
(20.4.1.500 NMAC)

Postclosure care for each hazardous/mixed-waste unit must begin after completion of closure and continue for 30 years after that date. All postclosure care must be performed in accordance with the postclosure plan for the facility.

Postclosure care and use of property will be performed in accordance with the Post-Closure Plan.

25.2.3.46 Postclosure Plan; Amendment of Plan, 40 CFR §264.118
(20.4.1.500 NMAC)

The owner/operator of a hazardous or mixed waste disposal unit must have a written postclosure plan. The plan, approved by the Secretary or designee, may be amended subject to the Secretary's approval.

The Post-Closure Plan is Attachment J of the HWFP.

25.2.3.47 Postclosure Notices, 40 CFR §264.119 (20.4.1.500 NMAC)

A record of the type, location, and quantity of hazardous/mixed wastes disposed of within each unit must be submitted to the NMED and the authority with jurisdiction over local land use no later than 60 days after submittal of the certification of closure. Within the same time frame, the owner/operator must also record a notation in the deed to the facility that the facility has been used to manage hazardous/mixed wastes and that the record of type, location, and quantity of waste disposal has been filed; the owner/operator must also certify that this notation has been recorded as required.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The DOE will submit to the NMED and to Eddy County within 60 days after certification of final closure, a registered professional engineer's certification. The DOE will also assure that this notification is properly recorded in the deed to the facility.

25.2.3.48 Certification of Completion of Postclosure Care, 40 CFR §264.120 (20.4.1.500 NMAC)

Within 60 days of the completion of postclosure of each landfill unit and within 60 days of completion of final postclosure, the owner/operator must submit a certification that the hazardous or mixed-waste unit has been closed in accordance with the specifications in the approved postclosure plan. The certification must be sent to the NMED Secretary by registered mail and must be signed by the owner/operator and by an independent registered professional engineer.

The DOE will notify the NMED within 60 days after completion of postclosure care, with a registered professional engineer's certification that the postclosure care period was performed in accordance with the Post-Closure Plan.

25.2.3.49 Title 40 CFR Subpart I, "Condition of Containers" (40 CFR §§264.171, 264.172, 264.173, 264.174, 264.175, 264.176, 264.177, 264.178 and 264.179) (20.4.1.500 NMAC)

Subpart I of 40 CFR addresses the requirements for the use and management of containers at TSDFs. This section addresses container condition, compatibility of wastes with containers, management of containers to prevent releases, keeping the containers closed, weekly inspections, containment, requirements for ignitable or reactive wastes, special requirements for incompatible wastes, closure, and the air emission standards.

Module III of the HWFP and Attachment M1, Container Storage, describe how the MOC complies with the requirements for the use and management of containers. Wastes are received in TRUPACT-II shipping containers, which are stored in the Parking Area Unit and opened in the Waste Handling Building. Containers meeting DOT 7A specifications are removed from the TRUPACT-II. The WIPP WAC and waste handling procedures are in place to ensure that waste is shipped to WIPP in containers that are in good condition. A compatibility study was conducted and submitted in Appendix C1 of the WIPP RCRA Part B Application (DOE, 1997a) to document that the containers used (steel drums, some containing polyethylene liners) meet the requirements of 40 CFR 264.172. Containers are not opened at WIPP and procedures are in place to ensure that every effort is taken to minimize the potential for damaging a container. Inspections are conducted daily as described in Attachment D of the HWFP. Calculations are included in Attachment M1 of the HWFP demonstrating adequate secondary containment. The WAP and WAC prohibit ignitable, reactive and incompatible wastes from being shipped to WIPP. All container storage areas will be

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

closed as described in Attachments I and I3, Radiological Surveys to Indicate Potential Hazardous Waste Releases, of the HWFP. The air emission standards for containers are not applicable to TRU mixed wastes disposed of at WIPP.

25.2.3.50 Title 40 CFR Subpart X, "Miscellaneous Units," (40 §§CFR 264.601, 264.602 and 264.603)

A miscellaneous unit must be located, designed, and operated, maintained and closed in a manner that will ensure protection of human health and the environment. Monitoring, testing, analytical data, inspections, response and reporting procedures and frequencies must protect human health and the environment. A miscellaneous unit must be maintained in manner that complies with the environmental performance standards during the postclosure care period.

Module IV, Geologic Repository Disposal, and Attachment M2 of the HWFP describes the location, design, operation, and maintenance of the geologic repository and associated environmental monitoring. Monitoring and testing includes geomechanical, ventilation rate, and VOC monitoring. Annual reports are submitted to the NMED to demonstrate compliance with these requirements. No HWDUs have been closed to date. Each underground HWDU will be closed in accordance with Attachment I1, Technical Specifications, Panel Closure System, Waste Isolation Pilot Plant; and the final repository closure plan is incorporated into the HWFP as Attachment I2, Shaft Sealing System Compliance Submittal Design Report. Attachment J is the Post-Closure Plan, which describes the activities required to maintain WIPP after the completion of facility closure.

25.2.4 Compliance With the Hazardous/Mixed Waste Permit Program, 40 CFR Part 270 (20.4.1.900 NMAC and 20.4.1.901 NMAC)

The requirements of 40 CFR Part 270 pertain to general Hazardous Waste Facility permitting requirements for TSDFs and include provisions for submitting applications, standard permit conditions, monitoring and reporting requirements, and modifying permits. The compliance status of each applicable requirement is summarized in the text below.

25.2.4.1 Purpose and Scope of the Hazardous Waste Facility Permit Program Regulations, 40 CFR §270.1 (20.4.1.900 NMAC)

The purpose and scope of the HWFP program regulations are defined, and the regulations are summarized.

The DOE submitted a HWFP application to the EPA and to the NMED. The Permit Application was for the storage of hazardous waste in two units (Parking Area Unit and Waste Handling Building) in accordance with 40 CFR Subpart I, and for the disposal of hazardous waste (underground HWDUs) in accordance with Subpart X. Hearings on

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

the draft permit and final permit issuance occurred in February and March 1999, respectively. The permit was issued on October 27, 1999, and was effective on November 26, 1999. The permit was updated in February 2002 to include permit modifications that had been approved by the NMED.

25.2.4.2 Signatories to Permit Applications and Reports, 40 CFR §270.11 (20.4.1.900 NMAC)

Signatories to permit applications shall be by a senior executive officer with responsibility for overall operations for a federal agency and/or a responsible corporate officer for a corporation. Reports and plans required by permits (e.g., the annual waste minimization plan) and other information requested shall be signed by a duly authorized representative. Any person signing one of these documents is required to make the certification statement specified in 40 CFR §270.11(d).

The requirement is incorporated into the HWFP in Module I.F., Signatory Requirement. Signatory requirement and apportionment of the signatory authority were discussed in Part A of the Permit Application.

25.2.4.3 Conditions Applicable to all Permits, 40 CFR §270.30 (20.4.1.900 NMAC)

Conditions applicable to all permits are specified and include duty to comply, duty to reapply, minimization of releases, proper operation and maintenance, permit actions, property rights, duty to provide information, inspection and entry, monitoring and records, signatory requirements, and reporting requirements.

The general permit conditions are incorporated into Module I of the HWFP.

25.2.4.4 Requirements for Recording and Reporting of Monitoring Results, 40 CFR §270.31 (20.4.1.900 NMAC)

Requirements for recording and reporting monitoring results will be specified in the HWFP.

The requirements for recording and reporting monitoring results are incorporated into the HWFP.

25.2.4.5 Permit Modification at the Request of the Permittee, 40 CFR §270.42 (20.4.1.900 NMAC, and 20.5.1.901 NMAC)

After a HWFP has been finalized, the permittee may request that it be modified. Three classes of modifications are identified in Appendix I to 40 CFR §270.42. Class 1, the least significant of the permit modifications, covers minor modifications such as the

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

correction of typographical errors; changes to conform with agency guidelines or regulations; or procedural changes that increase the frequency of monitoring, reporting, sampling, or maintenance activities. Class 1 modifications require notification of the Director within 7 days after the change has been made; all persons on the facility mailing list must be notified within 90 calendar days after the change is put into effect or after the request, whichever applies.

Class 2 modifications are more extensive and significant and apply to changes needed to allow timely response to common variations in the types and quantities of wastes managed, technological advancements, and changes in the regulations (e.g., changes in emergency procedures or removal of equipment from the emergency equipment list). They require that the permittee submit a modification request to the Director, announce a 60-day comment period, notify all persons on the facility mailing list, publish the notice in a major local newspaper of general circulation, and hold a public meeting.

Class 3 modifications are the most significant and potentially impactful and substantially alter the facility or its operation (e.g., extending the closure period or a final compliance date; creating a new landfill or other type of unit or increasing the capacity of a preexisting one). The notification and other requirements are similar to those for Class 2 modifications.

The DOE has notified the NMED of several Class 1 permit modifications and requested several additional Class 2 and Class 3 modifications, since issuance of the HWFP. For this reporting period, approximately thirteen Class 1, seven Class 2, and one Class 3 permit modification groups were submitted to the NMED.

25.2.5 Compliance With the Universal Waste Management Regulations Under 20.4.1.1000 NMAC (40 CFR Part 273)

25.2.5.1 Standards for Universal Waste, Small Quantity Handlers, 40 CFR Part 273, Subpart B (20.4.1.1000 NMAC)

Small-quantity handlers are those who accumulate less than 5,000 kilograms of universal waste at any one time.

WIPP is a small-quantity handler of universal waste.

The MOC manages nickel-cadmium and lithium batteries at WIPP under the universal waste regulations. Universal waste regulations for used lamps have been adopted by the EPA, but not incorporated by the NMED. However, through a letter from the NMED

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

(Brinkerhoff to Rodriguez, August 3, 2000), the MOC was given permission to manage used lamps under these regulations.

25.2.5.2 Prohibitions, 40 CFR §273.11

Universal waste is not to be disposed of or diluted or treated to render it less hazardous (except in the possible case of releases from universal waste).

Universal waste is not treated at the WIPP site. Universal waste is handled in accordance with the requirements of 40 CFR Part 273. The universal waste is shipped off-site to a permitted facility.

25.2.5.3 Waste Management, 40 CFR §273.13

Universal waste must be properly contained so as to prevent releases and must lack evidence of leakage, spillage, etc.

Universal waste is managed in accordance with MOC hazardous and universal waste management plans and procedures. It is contained, stored in the Universal Waste Storage Area, and inspected weekly for evidence of spillage or leakage.

25.2.5.4 Labeling/Marking, 40 CFR §273.14

Universal waste must be labeled or marked appropriately (e.g., universal waste batteries).

Universal waste containers are marked with the words "Universal Waste," a brief description of the container contents, and the accumulation start date, in accordance with MOC hazardous and universal waste management plans and procedures.

25.2.5.5 Accumulation Time Limits, 40 CFR §273.15

A small-quantity universal waste handler may accumulate universal waste for up to one year from the date the waste was generated. A log, inventory or labeling/marking should be used to show the date that each item of universal waste was placed in the universal waste collection container in a specific accumulation area.

In accordance with the MOC hazardous waste management plans and procedures, the MOC logs the date universal waste is generated at WIPP and the date universal waste is shipped to an off-site TSDf for recycling. In accordance with inspection procedures, the MOC checks the accumulation date during weekly inspections to ensure that the one-year storage limit is not exceeded. To date, the MOC has not been out of compliance with these requirements.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.5.6 Employee Training, 40 CFR §273.16

Employees who handle or are responsible for managing universal waste should be provided with the appropriate information needed with respect to proper handling and appropriate emergency procedures for the type of universal waste being managed at the facility.

The handlers of universal waste and those responsible for its management are trained hazardous waste workers. This training applies to universal waste handlers and managers.

25.2.5.7 Responses to Releases, 40 CFR §273.17

All releases of universal wastes and residues from such wastes must be contained immediately; any material resulting from the release must be assessed to determine if it is hazardous waste; if so, it must be managed in compliance with all applicable RCRA regulations.

No releases of universal waste occurred during the reporting period. Any such releases of universal waste will be characterized and managed in accordance with procedures and processes in place for hazardous and universal waste.

25.2.5.8 Off-Site Shipments, 40 CFR §273.18

A small-quantity universal waste generator may send its universal waste only to another universal waste handler, a destination facility, or a foreign destination.

Universal waste is shipped to a permitted off-site recycling facility.

25.2.6 Compliance With the UST Regulatory Requirements Under 20.5 NMAC

This section of the report will examine the New Mexico UST requirements as they pertain to WIPP. Compliance status is summarized in the text below.

25.2.6.1 Scope, 20.5.1.2 NMAC (40 CFR §280.10)

Any owner or operator of an UST that contains a hazardous substance or petroleum product must meet the standards set by the New Mexico Environmental Improvement Board in the New Mexico USTRs.

There are two 8,000-gallon USTs at WIPP; one contains unleaded gasoline, and the other contains diesel fuel.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.2 Existing Tanks, 20.5.2.200 NMAC

The owner of any UST must register such tank or tanks with the Underground Storage Tank section of the NMED within three months after April 14, 1988, the effective date of this Part II as first adopted, except that any owner who has filed the form of notice entitled "Notification for Underground Storage Tanks," prescribed by the EPA and described in 40 CFR Part 280, is not required to register a tank for which a notice has been filed, provided that the information provided is still current.

Registration becomes effective upon receipt of the first year's annual fee described in Subsections 25.2.6.10 and 25.2.6.11 below. Registration must be renewed annually by payment of the annual fee until the permanent closure of the tank.

Both USTs at WIPP are properly registered with the UST Bureau of the NMED.

25.2.6.3 Transfer of Ownership, 20.5.2.201 NMAC

If ownership of the UST system changes, the new owner must reregister the tank with the division within 30 days of ownership transfer, using a form provided by the division.

This section is not applicable since ownership of the tanks has not been transferred.

25.2.6.4 New UST System, 20.5.2.202 NMAC

The owner must notify the division in writing at least 30 days before any new tank or UST system is installed and must register any new tank or UST system with the division prior to placing it in service.

No new UST systems were installed during this reporting period.

25.2.6.5 Substantially Modified UST Systems, 20.5.2.203 NMAC

When an existing UST system is substantially modified or replaced, the owner must notify the division in writing of such modification or replacement at least 30 days prior to the modification or replacement. Emergency repairs or replacements are exempt from these notification requirements.

No UST systems were substantially modified during this reporting period.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.6 Notification of Spill or Release, 205.2.204 NMAC

Notice of any known or suspected release from a UST system, any spill, or any other emergency situation must be given to the NMED in accordance with 20.5.7 NMAC.

No releases from USTs have occurred during this reporting period. If this should occur, MOC hazardous material spill and release response plans and procedures discuss the requirements for the proper handling of spills and releases.

25.2.6.7 Emergency Repairs and Tank Replacement, 20.5.2.205 NMAC

Immediate repairs or replacement of an UST system may be made in the event an emergency situation presents a threat to the public health, provided notice is given to the NMED.

No such emergency repair or replacement of a UST system was necessary during this reporting period.

25.2.6.8 Application Forms, 20.5.2.206 NMAC

All USTs must be registered on application forms provided by the NMED unless the EPA form (Notification for Underground Storage Tanks) has been submitted to the NMED and all information contained therein is still accurate. An application submitted by a municipal, state, or other public facility must be signed by either a principal executive officer, ranking elected official, or other duly authorized employee.

The New Mexico UST registration form is used to register the USTs at WIPP.

25.2.6.9 Registration Certificate, 20.5.2.207 NMAC

Upon submittal of a complete registration application or the EPA form and payment of the annual fee, the NMED shall issue a validated registration certificate which is current and valid and must be displayed on the premises of the UST system at all times. In the event that any information provided on the registration form or the EPA form changes or is no longer accurate, the change must be reported to the NMED on the appropriate form within 30 days.

The current registration certificate from the NMED is displayed in Facility Operations at the WIPP facility. It is submitted annually to the NMED by July 1.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.10 Payment of Fee, 20.5.3.300 NMAC

An annual per-tank fee shall be paid to the NMED no later than July 1 for each current calendar year or portion of a year that a tank is in use. A tank shall be deemed "in use" until notice is received by the NMED that the tank has been removed or otherwise permanently closed in a manner acceptable to the division.

The annual fee for a new tank placed in service after July 1 for any calendar year after 1989 shall be paid within 30 days after the tank is placed in service. The annual fees shall be designated to the Hazardous Waste and Underground Storage Tank Fund.

The annual fee per UST at WIPP was paid by July 1, 2000, and July 1, 2001.

25.2.6.11 Amount of Fee, 20.5.3.301 NMAC

The annual fee for each UST is \$100.00 per tank.

The annual fee paid for each UST at WIPP is \$100, or \$200 for both tanks.

25.2.6.12 Late Payment Penalties, 20.5.3.302 NMAC

In the event that the annual fee is not paid when due, a late fee of \$25.00 or 25 percent of the unpaid fee, whichever is greater, and interest charges at the rate of 1.5 percent per month shall be imposed and shall accumulate until the annual fee and all accrued late fees and interest charges are paid.

No late payment penalties have been incurred.

25.2.6.13 Performance Standards for New UST Systems - Tanks, 20.5.4.400 NMAC (40 CFR §280.20[a])

Each tank must be properly designed and constructed, and any portion underground must be protected from corrosion by a nationally recognized association or independent testing laboratory as specified. Each tank must be constructed of fiberglass-reinforced plastic; steel, with cathodic protection; or steel-fiberglass-reinforced-plastic composite. The tank may be constructed of metal without additional corrosion protection if the conditions apply as described in 20.5.4.400(4).

The tanks are designed and constructed of fiberglass-reinforced plastic in accordance with the appropriate standards.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.14 Design and Construction of Piping, 20.5.4.400.B NMAC (40 CFR §280.20[b])

The piping that routinely contains regulated substances and is in contact with the ground must be properly designed, constructed, and protected from corrosion in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified. The piping is constructed of fiberglass-reinforced plastic; or steel, with cathodic protection; or metal without additional corrosion protection measures provided that the piping is installed at a noncorrosive site and records are maintained that demonstrate the noncorrosivity of the site for the remaining life of the piping. The piping construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment.

The piping is constructed of fiberglass-reinforced plastic as designed by the Xerxes Corporation in accordance with the appropriate standards.

25.2.6.15 Performance Standards for New UST Systems - Spill Prevention Equipment, 20.5.4.400.C(1)(a) NMAC (40 CFR §280.20[c][1][i])

Owners and operators must use spill prevention equipment that will prevent the release of product to the environment when the transfer hose is detached from the fill pipe (for example, a spill catchment basin).

WIPP's UST system uses a spill catchment basin.

25.2.6.16 Overflow Prevention Equipment, 20.5.4.400.C(1)(b) NMAC (40 CFR §280.20[c][1][ii])

Overfill-prevention equipment must be used that will automatically shut off flow into the tank when the tank is no more than 95 percent full; alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high-level alarm; or restrict the flow 30 minutes prior to overfilling, alert the operator with a high-level alarm one minute before overfilling, or automatically shut off flow into the tank so that none of the fittings located on top of the tank is exposed to product due to overfilling. Owners and operators may use alternative equipment if it is determined by the implementing agency to be no less protective of human health and the environment than the equipment specified above or if the UST system is filled by transfers of no more than 25 gallons at one time.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The Model 310 extractor vent valve is used to automatically shut off the flow into the tank when the tank is no more than 95 percent full. This valve is a permanent part of the system.

25.2.6.17 Installation of Tanks and Piping, 20.5.4.400.D NMAC (40 CFR §280.20[d])

All tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer's instructions.

The installer (Cline Pump Company) certified on the NMED application that the methods used to install the tanks and piping comply with the requirements. Cline Pump Company has supplied the CBFO with copies of qualified certification.

25.2.6.18 Certificate of Installation, 20.5.4.400.E NMAC (40 CFR §280.20[e])

All owners and operators must ensure that one or more of the specified methods of certification, testing, or inspection was used to demonstrate compliance with 25.2.6.17 NMAC above by providing a certification of compliance on the UST notification form required by 20.5.2 NMAC. The allowable methods of certification for the installer are certification by the tank and piping manufacturers; certification or licensing by the implementing agency; inspection and certification of the installation by a registered professional engineer with education and experience in UST system installation, inspection and approval by the implementing agency, or the presence of a representative from the UST Bureau of the NMED at the installation; completion of all work listed on the manufacturer's installation checklists; or compliance with another method for ensuring compliance with this section that is determined by the implementing agency to be no less protective of human health and the environment.

Cline Pump Company is certified by the NMED. The installation of the new systems was inspected and approved by an NMED representative who was present during the installation.

25.2.6.19 Certificate of Compliance and Notification Requirements, 20.5.4.402 NMAC (40 CFR §280.22)

In the registration application required by 20.5.2 NMAC, all owners and operators of new UST systems must certify compliance with the installation requirements of USTR Section 400(e), cathodic protection requirements for steel tanks and piping under Sections 400(a) and (b), financial responsibility under 20.5.9 NMAC, and release detection under Sections 601

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

and 602. The owners and operators must also ensure that the installer certifies that the methods used to install the tanks and piping comply with the requirements in Section 400(d).

The notification requirements pertain to the person who sells a tank intended to be used as an UST.

As outlined in the registration form, the certification requirements were met. The cathodic protection requirements are not applicable since neither the tank nor the piping is made of steel. The financial responsibility requirements cited in 20.5.9.1.900.C NMAC are not applicable because WIPP is a federal facility. The notification requirements apply only to the person who sold the tank to be used as an UST and do not apply to WIPP.

25.2.6.20 Spill and Overfill Control, 20.5.5.500.A NMAC (40 CFR §280.30)

Owners and operators must ensure that any releases due to spilling or overfilling do not occur, that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made, and that the transfer operation is monitored constantly to prevent overfilling and spilling.

The new tanks are equipped with spill and overfill protection equipment. Applicable MOC hazardous material spill and release response plans and procedures are in place that govern the transfer of product to the tanks and that specify requirements for reporting, cleaning up, and investigating spills or overfills.

25.2.6.21 Compatibility, 20.5.5.502 NMAC (40 CFR §280.32)

Owners and operators must use an UST system made of or lined with materials that are compatible with the substance stored in the UST system.

Fiberglass-reinforced plastic is compatible with unleaded gasoline and diesel fuel.

25.2.6.22 Repairs Allowed, 20.5.5.503.A NMAC (40 CFR §280.33[a])

Repairs to UST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

No unauthorized repairs were made during this reporting period.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.23 Repairs to Fiberglass-Reinforced Plastic Tanks, 20.5.5.503.B NMAC (40 CFR §280.33[b])

Repairs to fiberglass-reinforced plastic tanks may be made by the manufacturer's authorized representatives or in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

No unauthorized repairs were made during this reporting period.

25.2.6.24 Repairs of Pipe Sections and Fittings, 20.5.5.503.C NMAC (40 CFR §280.33[c])

Metal pipe sections and fittings that have released product as a result of corrosion or other damage must be replaced. Fiberglass pipes and fittings may be repaired in accordance with the manufacturer's specifications.

No repairs to pipes or fittings were performed during this reporting period.

25.2.6.25 Tightness Testing After Repairs, 20.5.5.503.D NMAC (40 CFR §280.33[d])

Repaired tanks and piping must be tightness tested in accordance with 20.5.6.603.D NMAC and 20.5.6.604.B NMAC within 30 days after the date of the completion of the repair except as provided in this section.

No repairs to tanks or piping were required during this reporting period.

25.2.6.26 Records of all Repairs, 20.5.5.503.F NMAC (40 CFR §280.33[f])

UST system owners and operators must maintain records of each repair for the remaining operating life of the UST system to demonstrate compliance with the requirements of this section.

No repairs were performed on the USTs during this reporting period. When UST system repairs are necessary, the records will be maintained at WIPP for the life of the UST system.

25.2.6.27 Reporting, 20.5.5.504.A NMAC (40 CFR §280.34[a])

Owners and operators must submit the following information to the NMED: registration of all UST systems, including certification of installation for new UST systems (20.5.2 NMAC); reports of all releases (including suspected releases, spills, and overfills) and confirmed releases; corrective actions planned or taken; and a notification before permanent closure or change in service.

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

The applicable information in this requirement has been submitted to the NMED. Spill, overfill, and release reporting requirements are addressed by MOC hazardous material spill and release response plans and procedures.

25.2.6.28 Record-Keeping Requirements, 20.5.5.504.B NMAC (40 CFR §280.34[b])

Owners and operators must maintain the following information: a corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used, documentation of operation of corrosion protection equipment, documentation of UST system repairs, recent compliance with release detection requirements, and the results of the site investigation required prior to permanent closure.

The only metal parts in the UST system are aboveground connections. Rubber boots are placed around these connections to prevent any corrosion. The rubber boots are considered adequate to meet the corrosion protection requirements since the tank and piping consist of fiberglass-reinforced plastic. Metal flex elbow fittings are contained within the rubber boots, which separate them from contact with the ground.

Applicable MOC procedures identify records generated in the performance of UST system repairs. The MOC facility operations Records Inventory and Disposition Schedules adequately address the record retention requirements of this section.

An MOC procedure addresses the retention of monitoring results.

25.2.6.29 Availability and Maintenance of Records, 20.5.5.504.C NMAC (40 CFR §280.34[c])

The applicable records must be kept either at the UST site and immediately available for inspections by the NMED or at a readily available alternative site and be provided to the NMED upon request.

The UST records are maintained at the WIPP site and are readily available to NMED inspectors.

25.2.6.30 Inspections, Monitoring, and Testing of USTs, 20.5.5.505.A NMAC

Any owner or operator of an UST shall, upon the request of the director or authorized NMED representatives, furnish information relating to the UST(s), conduct monitoring or testing, and allow the NMED representative to have access to the USTs and to copy all records relating to such tanks at all reasonable times. NMED officers, employees, or representatives will be allowed to inspect the UST system(s) and obtain samples of their contents and to conduct monitoring or testing of the tanks and its associated

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

equipment or the surrounding soils, air, surface water, or groundwater.

No monitoring or testing information has been requested to date. NMED personnel are allowed to inspect the UST systems at any reasonable time. They are also allowed to sample the contents of the USTs. Monitoring or testing of the tanks and associated equipment and contents or the surrounding soils, air, or surface or groundwater may also be performed.

25.2.6.31 Inspections of UST Installations, Repairs or Modifications, or Removals or System Closures, 20.5.5.505.C NMAC

The owner and operator must allow the Director or authorized NMED representatives to be present at and inspect all UST system installations, replacements, repairs, substantial modifications, installations of leak detection systems, and UST system closures. To ensure that the inspector has an opportunity to be present during the steps in these procedures which are important to the prevention of releases, the owner or operator must give the NMED oral notice of the dates on which critical junctures in the installation, repair, substantial modification, or closure of the UST system are to take place. Oral notice must be given at least 24 hours in advance of the commencement of the procedure. The inspector may require that critical junctures be performed from Monday through Friday during regular business hours.

A representative of the NMED UST Bureau was present at the installation of the UST systems on February 10, 1992.

25.2.6.32 General Requirements for all UST Systems, 20.5.6.600.A NMAC (40 CFR §280.40[a])

Owners and operators of new and existing UST systems must provide a method, or combination of methods, of release detection that can detect a release from any portion of the tank and the connected underground piping that routinely contains product; is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition; meets the performance requirements; and must be capable of detecting the leak rate or quantity specified for that method in the corresponding section of the rule with a probability of detection of 0.95 and a probability of false alarm of 0.05.

The UST system uses interstitial monitoring to detect releases. There are sensors between the walls at the lowest end of the piping and tank. Interstitial monitoring is

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

adequate because it can detect a release through the inner wall in any portion of the double-walled tank and/or piping that regularly contains product. The system is equipped with an alarm that will sound in the event of a leak into the interstitial area. In addition, MOC personnel compile a weekly leak report to assure correct operations of the leak detection system. Calibration and maintenance of the leak detection system is done by a certified UST repairman.

25.2.6.33 Notification of Releases, 20.5.6.600.B NMAC (40 CFR §280.40[b])

When a release detection method operated in accordance with the performance standards in 20.5.6.603 NMAC and 20.5.6.604 NMAC indicate that a release may have occurred, owners and operators must notify the NMED in accordance with 20.5.2.204 NMAC and 20.5.7 NMAC.

No releases or suspected releases have occurred with the current UST system during this reporting period.

25.2.6.34 Schedule for Required Release Detection, 20.5.6.600.C NMAC (40 CFR §280.40[c])

Owners and operators of all UST systems must comply with the release-detection requirements of this part by December 22 of the year listed in the schedule in 40 CFR §280.40(c).

The current UST systems were installed on February 10, 1992. The current systems meet the release-detection requirements of this part.

25.2.6.35 Requirements for Tanks of Petroleum UST Systems, 20.5.6.601.A NMAC (40 CFR §280.41[a])

Tanks must be monitored at least every 30 days for releases using one of the methods listed in 20.5.6.603 NMAC, except that UST systems that meet the performance standards and the monthly inventory control requirements may use tank tightness testing at least every five years until December 22, 1998, or until ten years after the tank is installed or upgraded, whichever is later; UST systems that do not meet the performance standards may use monthly inventory controls and annual tank tightness testing until December 22, 1998, when the tank must be upgraded or permanently closed; and tanks with a capacity of 550 gallons or less may use weekly tank gauging.

The interstitial monitoring system meets the release-detection requirement. Should the interstitial system become inoperable, monthly inventory controls will be used. In this contingency situation, tank tightness testing will be performed every five years.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.36 Requirements for Piping of Petroleum UST Systems, 20.5.6.601.B NMAC (40 CFR §280.41[b])

Underground piping that routinely contains regulated substances must be monitored for releases in a manner that meets the requirements for pressurized or suction piping.

See Subsection 25.2.6.38 below, which specifies the requirements for suction piping as used in the UST systems at WIPP.

25.2.6.37 Requirements for Pressurized Piping, 20.5.6.601.B(1) NMAC (40 CFR §280.41[b][1])

Underground piping that conveys regulated substances under pressure must be equipped with an automatic line leak detector and have an annual line-tightness test or have monthly monitoring conducted.

This requirement is not applicable since the current UST system operates under suction piping.

25.2.6.38 Requirements for Suction Piping, 20.5.6.601.B(2) NMAC (40 CFR §280.41[b][2])

Underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every three years in accordance with 20.5.6.604.B NMAC, or use a monthly monitoring method conducted in accordance with 20.5.6.604.C NMAC. No release detection is required for suction piping that is designed and constructed to meet the following standards: the below-grade piping operates at less than atmospheric pressure; the below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released; only one check valve is included in each suction line; the check valve is located directly below and as close as practical to the suction pump; and a method is provided that allows compliance with this section to be readily determined.

No release detection is required on the piping since the system was designed and constructed to meet each of the above requirements.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.39 Requirements for Hazardous Substance UST Systems, 20.5.6.602 NMAC (40 CFR §280.42)

A number of release-detection requirements are specified for UST systems that contain hazardous substances.

There are no UST systems at WIPP that contain hazardous substances. These requirements do not apply to this facility.

25.2.6.40 Methods of Release Detection for Tanks, 20.5.6.603 NMAC (40 CFR §280.43)

A number of requirements for the acceptable release-detection methods are specified. The release-detection methods described are inventory control, manual tank gauging, tank-tightness testing, automatic tank gauging, vapor monitoring, groundwater monitoring, interstitial monitoring, and other methods.

The MOC uses interstitial monitoring to meet this requirement.

25.2.6.41 Inventory Control, 20.5.6.603.A NMAC (40 CFR §280.43[a])

Product inventory control (or another test of equivalent performance) must be conducted monthly to detect a release of at least 1.0 percent of flow-through plus 130 gallons on a monthly basis in the following manner: inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank are recorded each operating day; the equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch; the regulated substance inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery; deliveries are made through a drop tube that extends to within 1 foot of the tank bottom; product dispensing is metered and recorded within the local standards for meter calibration or an accuracy of 6 cubic inches for every five gallons of product withdrawn; and the measurement of any water level in the bottom of the tank is made to the nearest one-eighth of an inch at least once a month.

Inventory control is a "contingency" method used only if the interstitial monitoring system fails. The MOC underground fuel station operation procedure addresses the requirements for using this method if this situation arises. Compliance with the requirement for a drop tube extending to within one foot of the tank bottom has been verified through discussions with the installing organization. The stick reading can measure to the nearest one-eighth of an inch.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.42 Interstitial Monitoring, 20.5.6.603.G NMAC (40 CFR §280.43[g])

Interstitial monitoring between the UST system and a secondary barrier immediately around or beneath it may be used, but only if the system is designed, constructed, and installed to detect a leak from any portion of the tank that routinely contains product and also meets one of the following requirements: for double-walled UST systems, the sampling or testing method can detect a release through the inner wall in any portion of the tank that routinely contains product; for UST systems with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the UST system and the secondary barrier; the secondary barrier around or beneath the UST system consists of artificially constructed material that is sufficiently thick and impermeable (at least 10^{-6} cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection; the barrier is compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier, allowing a release to pass through undetected; for cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system; the groundwater, soil moisture, or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days; the site is assessed to ensure that the secondary barrier is always above the groundwater and is not located in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions; monitoring wells are clearly marked and secured to avoid unauthorized access and tampering; and, for tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.

The interstitial monitoring system is the primary method of release detection for the UST system. The as-built engineering drawings verify that this method can detect a release through the inner wall in any portion of the tank that routinely contains product.

25.2.6.43 Other Methods of Detecting Releases, 20.5.6.603.H NMAC (40 CFR §280.43[h])

Any other method may be used if it can detect a 0.2-gallon-per-hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05, and it has been approved by the NMED.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The MOC does not use any methods of release detection other than the ones described in Subsection 25.2.6.42 above.

25.2.6.44 Methods of Release Detection of Piping, 20.5.6.604 NMAC (40 CFR §280.44)

Each method of release detection for piping used to meet the requirements of 20.2.5.6.601 NMAC must be conducted in accordance with specific requirements for automatic line leak detectors, line tightness testing, or applicable tank methods.

Since the system meets the requirements of 20.5.6.601.B NMAC, line leak detectors are not required.

25.2.6.45 Release Detection Record Keeping, 20.5.6.605 NMAC (40 CFR §280.45)

All UST system owners and operators must maintain records in accordance with 20.5.5.504 NMAC, which demonstrate compliance with all applicable requirements in 20.5.6 NMAC. All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be maintained for five years, or for another reasonable period of time determined by the NMED, from the date of installation. The results of any sampling, testing, or monitoring must be maintained for at least one year, or for any reasonable period of time determined by the NMED, except that the results of tank tightness testing conducted in accordance with 20.5.6.603.C NMAC, must be retained until the next test is conducted. Written documentation of all calibration, maintenance, and repair of release-detection equipment permanently located on-site must be maintained for at least one year after the servicing work has been completed or for any reasonable time period determined by the NMED. Any schedules of required calibration and maintenance provided by the release-detection equipment manufacturer must be retained for five years from the date of installation.

The MOC purchasing group maintains the manufacturer's equipment and performance claims records. The MOC records management program discusses the maintenance of records. The MOC purchasing group's Records Inventory and Disposition Schedule adequately addresses the record retention requirements of this section. According to the manufacturer of the tanks, no calibration or maintenance is required for the current configuration. If modifications are made, these functions will need to be performed.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.46 Suspected Releases, 20.5.7.701 NMAC (40 CFR §280.50)

Owners and operators of UST systems must report suspected releases to the NMED within 24 hours, and follow the procedures in 20.5.7.703 NMAC for any of the following conditions:

- *The discovery by owners and operators or others of released regulated substances at the UST site or in the surrounding area*
- *Unusual operating conditions*
- *Monitoring results from a release detection method that indicate that a release may have occurred unless the monitoring device is found to be defective and is immediately repaired and subsequent monitoring does not confirm the initial results or, in the case of inventory control, a second month of data does not confirm the initial result.*

No releases or suspected releases have occurred from the current UST system during this reporting period. The MOC underground fuel station operation procedure outlines the required steps above should a suspected release occur.

25.2.6.47 Investigation Due to Off-Site Impacts, 20.5.7.702 NMAC (40 CFR §280.51)

When required by the NMED, owners and operators of UST systems must follow the procedures in 20.5.7.702 NMAC to determine if the UST system is the source of off-site impacts.

The NMED has not requested off-site impact information.

25.2.6.48 Confirmation Steps, 20.5.7.703 NMAC (40 CFR §280.52)

Unless corrective action is initiated in accordance with 20.5.12 NMAC and 20.5.13 NMAC, owners and operators must immediately investigate and confirm all suspected releases of regulated substances that require reporting under 20.5.7.701 NMAC within seven days using a system test and/or a site check as described in more detail in this part of the regulations. If a leak in the UST system is found to exist, the system must be repaired, replaced, or upgraded as needed.

The MOC underground fuel station operation procedure indicates the appropriate testing, investigating, reporting, and corrective action to be taken if a release of regulated substances is suspected. There were no leaks in the WIPP USTs during this reporting period.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

25.2.6.49 Reporting and Cleanup of Large Spills and Overfills, 20.5.7.704.A NMAC (40 CFR §280.53[a])

Owners and operators of UST systems must contain and immediately clean up a spill or overfill and report it to the NMED within 24 hours. If a spill or overfill of a petroleum product results in a release to the environment that exceeds 25 gallons, or a hazardous substance spill results in a release to the environment that equals or exceeds its RQ under CERCLA (40 CFR Part 302), corrective action must be initiated in accordance with 20.5.12 NMAC and 20.5.13 NMAC.

There were no large spills or overfills with the WIPP USTs during this reporting period. The MOC underground fuel station operation procedure addresses the requirements with respect to petroleum UST systems (i.e., as specified in 20.5.12 NMAC). No hazardous substances are contained in UST systems at WIPP; therefore, USTRs Part XIII does not apply.

25.2.6.50 Reporting and Cleanup of Small Spills and Overfills, 20.5.7.704.B NMAC (40 CFR §280.53[b])

Owners and operators of UST systems must contain and immediately clean up a spill or overfill of a petroleum product that is less than 25 gallons and a spill or overfill of a hazardous substance that is less than the RQ. If cleanup cannot be accomplished within 24 hours, owners and operators must immediately notify the implementing agency.

Small spills and overfills have been properly contained and cleaned up. The MOC underground fuel station operation procedure addresses this requirement with respect to petroleum UST systems. No UST systems are used to contain hazardous substances at WIPP.

25.2.6.51 Temporary Closure, 20.5.8.800 NMAC (40 CFR §280.70)

When an UST system is temporarily closed, owners and operators must continue operation and maintenance of corrosion protection in accordance with 20.5.5.501 NMAC, and any release detection in accordance with 20.5.6 NMAC, 20.5.7 NMAC, 20.5.12 NMAC, 20.5.13 NMAC, and 20.5.3.304 NMAC must be complied with if a release is suspected or confirmed. However, release detection is not required as long as the UST system is empty. When an UST system is temporarily closed for three months or more, the vent lines must be left open and functioning, and all other lines, pumps, manways, and ancillary equipment must be capped and secured.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Documentation of the original tank closures was submitted to NMED. No temporary closure took place.

25.2.6.52 Corrective Action, 20.5.8.802.B NMAC (40 CFR §280.72[b])

If contaminated soils, contaminated groundwater, or free product as a liquid or vapor are discovered, owners and operators must begin corrective action in accordance with 20.5.12 NMAC or 20.5.13. NMAC.

The MOC has procedures in place which address the required actions to take if a release or suspected release is identified. (See Subsection 25.2.6.54 below for further information.)

25.2.6.53 Applicability of Financial Responsibility, 20.5.9.900 NMAC (40 CFR §280.90)

State and federal government entities whose debts and liabilities are the debts and liabilities of a state or the United States are exempt from the requirements of 20.5.9 NMAC, "Financial Responsibility."

As the owner of WIPP, the DOE is exempt from the financial responsibility requirements of this part.

25.2.6.54 Cleanup Requirements for Releases from Petroleum UST Systems, 20.5.12.1200.A NMAC

All releases must be cleaned up through soil remediation, ground- and surface-water remediation, and any other appropriate procedures in a manner protective of health, public welfare, and the environment.

No releases occurred from the WIPP USTs during this reporting period.

26.0 NEW MEXICO SOLID WASTE ACT

26.1 Summary of the Law

With the enactment of the Solid Waste Act in 1990, the New Mexico Legislature authorized and directed the establishment of a comprehensive and integrated solid waste management program at both the state and local levels. This legislation directs the planning and regulation of the reduction, storage, collection, transportation, and disposal of solid waste and authorizes the establishment of a system of permits for the construction, operation and, if applicable, closure and postclosure maintenance of solid waste facilities.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The Solid Waste Act is implemented by the New Mexico Solid Waste Management Regulations (SWMRs). The SWMRs are contained within 20.9.1 NMAC. These regulations are applicable to WIPP because infectious wastes are generated at the facility, because soil(s) may become contamination from unintentional releases of petroleum products, and because WIPP is allowed to receive asbestos wastes for disposal in HWDUs. A construction debris landfill is operational at the site but is exempt under §108 of the SWMRs.

26.2 Compliance Status of the Regulatory Requirements

The text summarizes the applicable requirements and their compliance status under the New Mexico Solid Waste Act.

26.2.1 General Requirements, 20.9.1.106 NMAC

All solid waste must be processed or disposed of by means in accordance with Environmental Improvement Board regulations, including recycling, composting, transformation, or landfilling. Generators of solid waste must provide containers for the solid waste except for construction and demolition debris, yard refuse, and appliances.

A construction debris landfill is operational at the WIPP site. The construction landfill is on property owned by the DOE and receives nonhazardous material generated on the property from construction activities. No hazardous wastes or materials are allowed in the landfill. The landfill is covered by the exemption found in §108 of the SWMRs. The requirements and rules of operation for the landfill are described in a WIPP procedure that provides guidelines for the operation of the construction landfill in a manner that is protective of human health and the environment and ensures compliance with applicable local, state, and federal laws and regulations.

Infectious wastes are generated at the facility and are managed in accordance with the applicable requirements of §706 of the SWMRs. Infectious wastes generated at the site are shipped off-site for disposal. Petroleum-contaminated soils generated at the facility are managed in accordance with the applicable requirements of §708 of the SWMRs. Petroleum-contaminated soil is shipped off-site for remediation.

26.2.2 Prohibited Acts, 20.9.1.107 NMAC

Section 20.9.1.107 NMAC specifies prohibited acts including the following: disposal of solid waste in places other than a permitted solid waste facility; disposal of regulated waste such as special waste, hazardous waste, radioactive materials, and petroleum waste; disposal of bulk liquids; and disposal of any solid wastes that are known to be harmful to the environment or hazardous to public health or safety.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The following wastes are excluded from disposal in the WIPP landfill:

- Radioactive materials
- Hazardous or other regulated materials, including petroleum products
- Liquids, or containers that contain liquids
- Any recyclable materials as determined by the MOC
- Municipal Solid Waste

Construction debris that may be disposed of in the landfill is material generally considered to be non-water-soluble and nonhazardous in nature and includes timbers, pipes, excavation soil (if not contaminated with hazardous materials/wastes), concrete, packing materials, sheet metal, glass, and wood. All site-generated wastes other than construction debris are sent to licensed, off-site facilities for disposal.

26.2.3 Exemptions, 20.9.1.108.C NMAC

This Part does not apply to disposal of construction and demolition debris or yard refuse by a person in possession of property if the material was generated on the property and if the disposal of the solid waste does not violate any provision of this Part.

WIPP's landfill falls within this exemption. The DOE is not required to obtain a landfill permit for construction debris generated and disposed on the WIPP site.

26.2.4 Record Keeping and Annual Reports, 20.9.1.109 NMAC

Operators of solid waste facilities shall make and maintain records during the active life of the facility. Operators shall submit annual reports to the Secretary of the NMED within 45 days after each calendar year.

The construction landfill is covered by the §108 exemption found in the SWMR. Although the landfill is exempt from record-keeping requirements, records for the landfill are maintained. The MOC construction debris disposal form is used to record the name, company, date, description and estimated volume of debris, and signatures of the landfill user and of the landfill custodian. No permit is required; therefore, no annual report is necessary.

26.2.5 Facilities, Entry by Department, Availability of Records to Department and Others, 20.9.1.111 NMAC

The Secretary or any authorized representative, employee or agent of the Department may enter any solid waste facility at any reasonable times for the purpose of making an inspection.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The NMED will be provided access to the facility any time it wishes to conduct an inspection.

26.2.6 Solid Waste Facility Permits, 20.9.1.200 NMAC

Any person seeking a permit to construct, operate, or modify a solid waste facility must file an application.

Section 20.9.1.108 NMAC provides an exemption for this site. The regulations do not apply to disposal of construction and demolition debris if the material is generated on the property and the disposal of the solid waste does not violate any provision of the regulations. This landfill is exempted from permit application requirements because it receives construction debris only and because it is located at the same site where the construction debris is generated. No permit is required for this landfill.

26.2.7 Registration of Commercial Haulers, 20.9.1.200.N NMAC

Transporters of special waste shall register with the NMED, submit a description of the solid waste facilities used, submit a contingency plan to the Secretary, and carry a copy of the plan and appropriate cleanup kits in the vehicle.

Transportation of special waste generated at WIPP is accomplished by an off-site contractor that meets the requirements.

26.2.8 Solid Waste Facility Operation Requirements, 20.9.1.400 NMAC

A solid waste facility must be located and operated so that it does not cause a public nuisance or create a potential hazard to public health or welfare.

The landfill is covered by the §108 exemption contained in the SWMR. In order to ensure compliance with the SWMR, the construction landfill is operated according to MOC procedures that ensure protection of public health and welfare.

26.2.9 Landfill Closure and Postclosure Requirements, 20.9.1.500 NMAC

Section 20.9.1.500 NMAC specifies a number of landfill closure and postclosure requirements including the installation of a final cover, preparing and implementing a land-use plan, a schedule for completing all closure work, an approved postclosure care and monitoring plan, and annual reports.

This landfill is exempted from these requirements because it receives construction debris only and because it is located at the same site where the construction debris is generated. Closure and postclosure requirements are not applicable.

26.2.10 Operator Certification, 20.9.1.600 NMAC

Section 20.9.1.600 NMAC provides requirements for operator certification. The amount and type of personnel training and experience are specified for landfills and for other types of facilities.

This landfill is exempted from these requirements because it receives construction debris only and because it is located at the same site where the construction debris is generated. Operator certification is not required.

26.2.11 Asbestos Waste, 20.9.1.700.E NMAC

Section 20.9.1.700.E NMAC specifies a number of requirements for transportation and disposal of asbestos waste, including transporter and labeling requirements.

These requirements are adequately addressed in the WIPP HWFP. In a letter from NMED dated July 14, 2000, the NMED stated that the standards for the management, storage, and disposal of waste in the WIPP HWFP exceed the standards specified for asbestos in 20.9.1.700.E NMAC; therefore, no additional conditions are necessary for asbestos wastes at WIPP.

26.2.12 Storage and Containment of Infectious Waste, 20.9.1.700.F NMAC

Section 20.9.1.700.F NMAC specifies infectious waste storage and containment requirements, including waste segregation; specifications for container integrity; container labeling and marking; and storage and containment area access, integrity, and marking.

The following practices are ongoing at WIPP:

- Access to the infectious waste collection and storage area is limited to trained medical and waste management personnel.
- Special containers are easily identifiable through the use of enclosed redlined biohazard bags.
- All sharps are sealed in containers that are leak-proof, puncture-proof, and tamper-proof. These containers are then enclosed in plastic biohazard bags.
- All containment bags are clearly identifiable with red lining as specified by 29 CFR §1910.145(f)(4).
- No infectious waste containers are reused.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

- Storage and containment areas are in an enclosed, clearly marked environment.
- No compaction or grinding devices are used to reduce the volume of infectious waste.

26.2.13 Infectious Waste Treatment, Storage, and Disposal Facilities, 29.1.700.F(4) NMAC

Section 29.1.700.F(4) specifies operational requirements for infectious waste treatment, storage, and disposal facilities. Included is a requirement for the preparation and maintenance of a management plan that identifies the type of waste generated or handled; the segregation, packaging, labeling, collection, storage, and transportation procedures to be implemented; the treatment or disposal methods to be used; the transporter and disposal facility to be used; and the person responsible for the management of the infectious waste.

The MOC transportation manual and the occupational health manual address the operational requirements for infectious waste as specified in this part.

26.2.14 Treatment and Disposal of Infectious Waste, 20.9.1.700.F(5) NMAC

Several methods are specified for the treatment and disposal of infectious waste. These methods include controlled incineration, heat sterilization, discharge to a sewage treatment system, and landfilling.

Infectious waste is sent to an off-site facility for incineration or steam sterilization.

26.2.15 Petroleum Contaminated Soil, 20.9.1.700.H NMAC

Section 20.9.1.700.H NMAC specifies sampling requirements, disposal prohibitions, storage requirements, and remediation allowances for all petroleum contaminated soils.

Petroleum-contaminated soils at WIPP are sampled and analyzed for Total Petroleum Hydrocarbons and other constituents as deemed necessary by the NMED or the MOC. Petroleum-contaminated soils are either remediated on-site or sent to an off-site facility for disposal or remediation.

26.2.16 Manifest Requirements, 20.9.1.712 NMAC

A manifest must accompany each shipment of infectious waste. Each manifest must include information on the waste generator,

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

transporter, waste treatment facility, the type of waste, and any special instructions.

Medical waste shipments are accompanied by a shipment manifest that includes the required information.

27.0 NEW MEXICO GROUND WATER PROTECTION ACT

27.1 Summary of the Law

The GWPA (§74-6B NMSA 1978) was enacted in 1990 in response to the threat facing public health and safety and the environment from pollution of groundwater resources from leaking USTs. The purpose of this act includes the provision of substantive direction that allows the state of New Mexico to take corrective action at sites contaminated by leakage from USTs.

The GWPA is implemented by the regulations of the NMED, NMED-92-1, *Ground Water Protection Act Corrective Action Fund Regulations*. These regulations provide guidelines for the payment or reimbursement of the costs of a minimum site assessment and corrective action and specify the requirements for owners or operators of leaking USTs. The GWPA prohibits expenditures from the Corrective Action fund for federally owned and operated sites.

The GWPA is also implemented by the GWPA regulations, which are provided in the New Mexico USTRs as Part XV. These regulations are discussed in Chapter 25.0 herein. The CBFO has installed two USTs at WIPP that meet the state's standards and requirements for USTs. Procedures are in place for routine operations regarding the tanks and for dealing with any spills or releases from the UST systems.

27.2 Compliance Status of the Regulatory Requirement

The below text summarizes the general regulatory requirement and its compliance status under the implementing regulation of the New Mexico GWPA.

27.3 Corrective Action for Spills/Releases from USTs, NMED-92-1

The owners or operators of USTs that release a regulated substance must take appropriate corrective action. The NMED will reimburse certain costs associated with performing a minimum site assessment and other corrective actions taken for spills or releases from USTs.

There were no releases from USTs during this reporting period that required corrective action.

28.0 NEW MEXICO AIR QUALITY CONTROL ACT

28.1 Summary of the Law

The New Mexico Air Quality Control Act (§§74-2-1 through 74-2-17 NMSA 1978), based primarily on the CAA (see Chapter 6.0 herein), is not generally more stringent than the CAA except in areas of air pollution prevention that have not been preempted by the CAA and are not precluded by the limiting provisions of the Air Quality Control Act. The Air Quality Control Act was formerly implemented by the Air Quality Control Regulations and is now implemented by 20.2 NMAC.

Under 40 CFR Part 70, operating permits are required for both area and major sources. The NMED will implement the federal requirements under 20.2.70 NMAC and 20.2.71 NMAC which describe the fee structure for the operating permit program. At this time, emission limits for area sources have not been established, and major source emission thresholds are being used to determine which facilities require operating permits under 20.2.70 NMAC.

28.2 Compliance Status of the Regulatory Requirements

The text summarizes the compliance status of the requirements in 20.2 NMAC that are potentially applicable to WIPP. It should be noted that 20.2.70 NMAC and 20.2.71 NMAC will deal with the state operating permit program and that the EPA has granted approval for the NMED's operating permit program. A brief discussion of WIPP's compliance status with respect to 20.2.70 NMAC is included in this section.

28.2.1 Sampling Equipment, 202.1.113 NMAC

Sampling equipment on stacks or other openings through which emissions are released to the atmosphere will be used as required.

The sampling equipment required for measuring emissions from the WIPP backup diesel generators was specified by the state in §3(b) of the permit. Sampling ports, safe sampling platforms, safe access to sampling platforms, and utilities for sampling and testing equipment have been provided. A 0.25-inch stainless steel sampling line adjacent to the sampling ports, which extends down to within 4 feet above ground level, has been installed as required by the permit. This sampling line provides access for future audits by the NMED.

28.2.2 Excess Emissions During Malfunction, Start-Up, Shutdown, or Scheduled Maintenance, 20.2.7.108 NMAC

Excess emissions during malfunction, start-up, shutdown, or scheduled maintenance must be minimized.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Special attention is paid during start-up, shutdown, scheduled maintenance, and any malfunction of the generators to ensure that emissions are minimized. The release of excess emissions is unlikely. However, a redundant system is in place, and the second backup generator will be used, as appropriate, to reduce potential emissions. If excess emissions occur, reporting will be performed as required by 20.2.7 NMAC. No problems were detected during this reporting period.

28.2.3 Controlling Emissions Leaving New Mexico, 20.2.8 NMAC

Emissions leaving New Mexico must not exceed the standards and regulations of the receiving state.

Emissions calculations and modeling that have been completed reveal that the emissions do not exceed the NAAQs.

28.2.4 Oil-Burning Equipment--Particulate Matter, 20.2.18 NMAC

Standards have been established for particulate-matter emissions from oil-burning equipment with a rated heat capacity exceeding 250 million British thermal units (BTU) per hour.

No oil-burning equipment at WIPP exceeds this rated heat capacity. The rated heat capacity of each of the generators is only 139.6 million BTU per hour.

28.2.5 Oil-Burning Equipment--Nitrogen Dioxide, 20.2.34 NMAC

Standards have been established for nitrogen dioxide emissions from oil-burning equipment with a rated heat capacity of 1,000,000 million BTU per hour.

No oil-burning equipment at WIPP exceeds this rated heat capacity. The rated heat capacity of each of the two generators is only 139.6 million BTU per hour.

28.2.6 Regulations to Control Open Burning, 20.2.60 NMAC

Open burning is allowed for the instruction and training of fire-fighting and rescue personnel when a permit is obtained from the NMED.

Firefighting training was not conducted at WIPP during this reporting period; therefore, no open-burning permit was required.

28.2.7 Regulations to Control Smoke and Visible Emissions, 20.2.61 NMAC

No person owning or operating stationary combustion equipment shall permit, cause, or allow visible emissions from stationary combustion equipment to equal or exceed an opacity of

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

20 percent. No emissions of smoke with an opacity greater than 30 percent shall be released into the open air for any period greater than 10 seconds from any diesel-powered vehicle operating below 8,000 feet mean sea level. Opacity emissions shall be determined using Method 9 described in Appendix A of 40 CFR Part 60 (minimum time period for taking opacity reading: 10 minutes).

Opacity measurements are not required for the backup diesel generators because no opacity measurements are specifically required under the permit (see Subsection 28.3.1 below). However, opacity testing has been performed on the generators and was found to be less than the 20 percent opacity limit.

Other diesel equipment is present on-site that does not require a permit under 20.2.72 NMAC because this equipment represents such a small source of emissions. The inventory on the equipment was submitted to the NMED with the permit application for the backup generators. The emissions from the diesel equipment fall well below the permit thresholds.

28.2.8 Compliance Plan, 20.2.70.300 NMAC

Submittal of a compliance plan is required as part of the operating permit application for 40 CFR Part 70 sources.

Based on the 1999 WIPP Air Emissions Inventory, HAPs and other pollutant emissions from the facility are below current operating permit threshold levels. No operating permit is required for WIPP. No Air Emissions Inventory was conducted during this reporting period.

28.2.9 Semiannual Operating Permit Reports and Progress Reports on the Compliance Plan, 20.2.70.300 NMAC

Semiannual operating permit reports and progress reports on the compliance plan will be filed, if applicable.

Based on the 1999 WIPP Air Emissions Inventory, HAP emissions from the facility are below current operating permit threshold levels, and an operating permit is not required for WIPP. The CBFO will be required to submit these reports if and when WIPP is considered to be subject to the operating permit program.

28.2.10 Permits, 20.2.72 NMAC

A permit is required for facilities that emit criteria pollutants or toxic air pollutants at rates that meet or exceed the threshold levels specified in 20.2.72 NMAC.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Permit No. 310-M-2 was issued by the NMED on December 7, 1993, and remained in effect throughout this reporting period. (See Subsection 28.3.1 below.)

28.2.11 Permit Fees, 20.2.75 NMAC

Permit fees must be paid with the submittal of a permit application.

The only permit required at WIPP under 20 NMAC 2 is for the diesel generators. (See also Subsection 28.3.1 below.) The permit fee for the diesel generators (\$10,100) was submitted with the permit application in July 1993.

28.2.12 Stack Height Requirements, 20.2.80 NMAC

Stack height requirements must be met.

WIPP meets the requirement for stack height. The state approved the MOC calculations and modeling with the issuance of Air Quality Permit No. 310-M-2. This permit was last amended on January 24, 2000.

28.3 Compliance Status of Permit Conditions

Only one permit issued under the NMAC is now in place at WIPP. The permit for the backup diesel generators, which was issued to WIPP on December 7, 1993, is in place. The permit conditions and the compliance status of each are provided in the text.

28.3.1 Permit for Backup Diesel Generators, Permit No. 310-M-2

The conditions specified by Air Quality Permit No. 310-M-2 for the backup diesel generators at WIPP are described in this section.

28.3.1.1 Construction and Operation, Condition 1

The plant (i.e., the diesel generators) shall be constructed and operated as described in the permit application dated June 18, 1993, and with the air quality monitoring information that was submitted on September 22, 1993, unless modified by the conditions of this permit. The facility consists of two Caterpillar diesel generators with a rated capacity of 1500 horsepower. Only one Caterpillar diesel engine may operate at one time, and the sum of hours of operation for both engines shall not exceed 480 hours per year. Changes in plans, specification, and other representations provided in the application documents shall not be made if they change the method of emissions control or in the character of the emissions or if they would increase the discharge of emissions. Any such proposed change must be submitted as a

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

proposal revision or modification of the permit in accordance with the condition described in Subsection 28.3.1.4 below.

The equipment described in the permit is being operated in accordance with the terms and conditions of the permit.

28.3.1.2 Emission Rates, Condition 2

The NMED has specified maximal emission rates for nitrogen oxide, carbon monoxide, sulfur dioxide, and particulate matter. The rates specified are in terms of pounds per hour and tons per year from each engine and from the facility (i.e., both engines).

The emissions were established during emissions testing in 1992. The amounts of emissions were based upon calculations for the equipment installed. The equipment is operated and maintained in accordance with the manufacturer's specification.

Currently, the only requirement the permit specifies with regard to emission rates is that the equipment be operated less than 480 hours per year. The limit on operating hours for the diesel generators is a control to limit the emissions to the emission rates specified in the permit.

28.3.1.3 Compliance Test Methods, Conditions 3-4

Initial compliance tests for all four pollutants described for Condition 2 [Subsection 28.3.1.2 above] are required for one of the diesel generators. Compliance tests may be reimposed if noncompliance is indicated or if the tests were technically unsatisfactory. The tests shall be conducted within 60 days after achieving the maximal production rate at which the generator will normally be operated. If the maximal production rate does not occur within 120 days of source start-up, the tests must be conducted no later than 180 days after the initial start-up of the source.

The tests shall be conducted in accordance with EPA Reference Methods 1-4, Method 5 (particulate matter), Method 6 (sulfur dioxide), Method 8 (A-E) (nitrogen dioxide), and Method 10 (carbon monoxide) contained in 40 CFR Part 60, Appendix A, and with the requirements of 40 CFR §60.8(f). The oxygen in the stack gas shall be determined by using EPA Method 3.

The NMED shall be notified of the date and time of compliance testing at least 30 days before the planned test date so that the NMED may have an observer present during testing. The permittee will arrange a pretest meeting with the NMED at least 30 days prior to the anticipated test date and shall observe the

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

pretesting and testing procedures described in detail under this condition. These requirements include submitting a written test protocol to the NMED at least 1 week prior to the testing date for approval and providing appropriate equipment and access to the NMED observer for sampling. Several parameters (i.e., engine revolutions per minute, exhaust static pressure, exhaust manifold temperature, fuel consumption, and horsepower as indicated by kilowatt output) shall be monitored and recorded during the test and the results included with the test report. Flow straighteners shall be installed where necessary to prevent cyclonic flow in the stack. The tests shall be conducted at 90 percent of full load or greater and at additional loads as specified by NMED personnel at the test or pretest meeting.

Two copies of the compliance test report must be submitted to the NMED within 30 days after completion of testing.

Compliance with these conditions was achieved and reported in the compliance test report, Emission Sampling Report, Backup Diesel Generator (IT Corporation, 1994), which was submitted to the NMED Air Quality Bureau on March 6, 1994, and approved on May 12, 1994.

28.3.1.4 Revisions and Modifications, Condition 5

Any future changes shall be preceded by the submittal of a permit application to the NMED in accordance with 20.2.72 NMAC. No modifications shall be made prior to the issuance of the revised permit.

There have been no revisions or modifications to the equipment or its operation during this reporting period.

28.3.1.5 Notification to Subsequent Owners, Condition 6

If there is any change in control or ownership of the diesel generators, the permittee shall notify the succeeding owner of the permit and its conditions and shall notify the NMED of the change in ownership within 15 days of the change.

There has been no change in ownership or control of the permitted equipment during this reporting period.

28.3.1.6 Right to Access Property and Review Records, Condition 7

The NMED will be given the right to enter the facility at all reasonable times to verify the terms and conditions of the permit. Upon receipt of a verbal or written request from any authorized

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

representative of the NMED, the company will produce any records or information necessary to demonstrate that the terms and conditions of the permit are being met.

Upon request, NMED representatives will be allowed entry to the site and will be provided with appropriate records and information. No NMED personnel requested entry to the site to verify the terms and conditions of the permit for the diesel generators within this reporting period.

28.3.1.7 Posting of the Permit, Condition 8

A copy of the permit will be posted and in view of the plant site at all times. It will be made available to NMED personnel for inspection upon request.

A copy of the permit is posted at the WIPP facility.

28.3.1.8 Record Keeping, Condition 9

DOE will maintain an operational log in which the date, time, and hours of operation will be recorded for each engine. The records will be maintained on-site for at least two years from the time of recording and will be made available to NMED personnel upon request.

Completion and maintenance of operational logs are carried out as prescribed by MOC procedures. Central Monitoring Room logs contain information about the diesel generators. The run times for the generators are recorded automatically by the Central Monitoring System. The records are maintained on-site for at least two years.

28.3.1.9 Reporting, Condition 10

The permittee will notify the NMED in writing or provide the NMED with the following information:

- The anticipated date of the initial start-up of each new or modified emission source at least 30 days prior to that date*
- The actual date of the initial start-up of each new or modified source within 15 days after the start-up date*
- The date when each new or modified source reaches the maximal production rate at which it will operate within 15 days after that date*
- Any change of operators within 15 days after the change*

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

- *Any necessary update or correction no more than 60 days after the operator knows or should have known of the condition necessitating the update or correction of the permit.*

Notice of the initial start-up of each source was submitted to the Air Quality Bureau in December 1993. No modifications necessitating reporting to the state were made during this reporting period.

28.3.1.10 Permit Cancellations (Permit, p.8)

The NMED will cancel the permit automatically if any source ceases operation for at least five years or if the construction or modification of a source is not initiated within two years from the date of issuance if work on construction or modification is suspended for a total of one year.

The state did not cancel the permit.

28.3.1.11 Notice of Intent and Emission Inventory (Permit, Page 8)

Requirements related to Notice of Intent and emission inventory are contained in 20.2.73 NMAC.

See Subsection 28.3.1.11.1 below, which pertains to compliance with 20.2.73 NMAC.

28.3.1.11.1 Annual Emission Inventory, 20.2.73 NMAC

An annual emission inventory is required annually for any stationary source permitted under 20.2.72 NMAC (except for those sources that are permitted only for toxic air pollutant emissions). Other sources that are required to file an annual emission inventory are those that must file a Notice of Intent under 20.2.73 NMAC or that emit in excess of 1 ton of lead or 10 tons of total suspended particulates, particulate matter with an aerodynamic diameter of 10 μ or less (i.e., PM_{10}), sulfur dioxide, nitrogen dioxide, carbon monoxide, or VOCs in any calendar year including and subsequent to 1990.

Emission testing for the diesel generators was performed in February 1994 and reported to the NMED as part of the original permit package. The MOC is not required to report annually because there are no emissions at the WIPP facility in excess of those listed.

29.0 NEW MEXICO WATER QUALITY ACT

29.1 Summary of the Law

With the enactment of the New Mexico Water Quality Act (74-6-1 through 74-6-17 NMSA 1978), a mechanism was provided at the state level to establish water-quality standards that are consistent with the CWA. The state act created the Water Quality Control Commission and directed the commission, as the state's water-pollution-control agency for all purposes of the CWA, to adopt a comprehensive water quality management program and water quality standards. The *New Mexico Water Quality Control Commission Regulations* include water-quality standards for ground and surface water and regulations regarding discharges to surface-water courses and groundwater.

Pursuant to the regulations of §3-109, "Director Approval, Disapproval, Modification, or Termination of Proposed Discharge Plans," the Discharge Plan (DP in citations) submitted by the DOE for the discharge of 23,000 gallons per day (gpd) of sewage effluent and up to 1,500 gpd of nonhazardous brine water from WIPP was approved in 1992.

Four modifications to the original permit have been granted by the NMED. The first increased the amount of nonhazardous brine that could be discharged; the second increased the amount of nonhazardous waters that could be discharged to the H-19 Evaporation Pond; the third added monitoring requirements of certain radionuclides; and the fourth allowed the discharge of laboratory produced, neutralized acids to the sewage facility. All of these changes were approved prior to this reporting period. There were no modification requests to this permit made during this reporting period.

Sections 20.7.4.12 and 20.7.4.13 NMAC define public water supply systems and public wastewater facilities. Under these definitions, and because of the size of the population served, WIPP is classified as a Class 1 public wastewater facility and a Class 2 public water supply system. Since these systems require certified operators, the WIPP facility employs operators and supervisors certified to the requirements of Subpart II of this Part.

29.2 Compliance Status of the Regulatory Requirements

The following text provides the regulatory requirements and their compliance status under the New Mexico Water Quality Act.

29.2.1 Notice of Intent to Discharge, 20.6.2.1201 NMAC

Any party intending to make a new water contaminant discharge or to alter the character or location of an existing water contaminant discharge, unless the discharge is being made or will be made into a community sewer system or subject to the Liquid Waste Disposal Regulations adopted by the New Mexico

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Environmental Improvement Board, shall file a notice with the Water Pollution Control Bureau of the New Mexico Environment Department (NMED).

There were no notices of intent to discharge filed during this reporting period.

29.2.2 Filing of Plans and Specifications - Sewerage Systems, 20.6.2.1202 NMAC

Any party proposing to construct a sewerage system or proposing to modify any sewerage system in a manner that will change the quantity or quality of the discharge from the system substantially must file plans and specifications for the construction or modification with the Water Pollution Control Bureau of the NMED.

Sewage system plans and specifications were included in the transmittal of the Discharge Plan application to the NMED.

29.2.3 Notification of Discharge - Removal, 20.6.2.1203 NMAC

Requirements for reporting, notifications, and corrective action with respect to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property are specified.

In the event of an unauthorized discharge of oil or other potentially harmful water contaminants, notification, reporting, and corrective action is performed in accordance with the WIPP environmental incident reporting procedure.

No discharges necessitating reporting, notification, and correction actions occurred during this reporting period.

29.2.4 General Requirements, 20.6.2.2101 NMAC

General discharge limitations and sampling/analytical requirements for the discharge of effluents to a watercourse must be met.

These limitations and requirements are specified in the NMED's Discharge Plan Approval DP-831. The discharge limitations and sampling analytical requirements are being met in accordance with an MOC procedure. During this reporting period, the CBFO submitted the required quarterly reports to the NMED on April 30, July 31 and October 31 of 2000; January 31, April 30, July 31, and October 31 of 2001; and January 31, 2002.

29.2.5 Discharge Permit Required, 20.6.2.3104 NMAC

No person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into groundwater unless he is discharging pursuant to a discharge permit issued by the Secretary. When a plan has been approved, discharges must be consistent with the terms and conditions of the discharge permit.

All discharges during this reporting period have been in compliance with the terms of the discharge plan, latest amendment dated January 24, 2000.

29.2.6 Application for Discharge Permits and Renewals, 20.6.2.3106 NMAC

Any person who intends to begin discharging any listed water contaminants or any toxic pollutant so that they may move directly or indirectly into groundwater must submit a Discharge Plan as required.

All discharges are consistent with the terms and conditions of the discharge permit. The NMED approved the discharge permit, amended on January 24, 2000.

29.2.7 Monitoring, Reporting, and Other Requirements, 20.6.2.3107 NMAC

Requirements include periodic reporting to the Secretary of any information that may be required as set forth in the discharge permit, and notifying the NMED of any facility expansion, production increase, or process modifications that would result in the discharge of water contaminants.

Monitoring reports are filed quarterly according to the following schedule: January 31, April 30, July 31, and October 31 of each year. There were no facility expansions, production increases, or process modifications that resulted in the discharge of water contaminants during this reporting period.

29.2.8 Public Notice and Participation, 20.6.2.3108 NMAC

Within 30 days of filing of a proposed discharge plan, or modification or renewal of an approved discharge plan, the NMED must ensure that the public and affected governmental agencies are notified.

No modification or renewals of the discharge plan took place during this reporting period; therefore, the NMED did not need to provide any notification to the public or governmental agencies.

29.2.9 Director Approval, Disapproval, Modification, or Termination of Proposed Discharge Plans, 20.6.2.3109 NMAC

If the monitoring data submitted indicate that these regulations are being or may be violated or that the standards in 20.6.2.3102 NMAC, "Standards for Ground Water of 10,000 mg/l [milligrams/liter] TDS [total dissolved solids] Concentration or Less," are being or will be exceeded in groundwater at any place of withdrawal for the present or reasonably foreseeable future due to the discharge, it may be necessary to modify the Discharge Plan.

Monitoring data during this reporting period did not reveal any information indicating that these regulations were violated.

29.2.10 Water Quality Standards for Interstate and Intrastate Streams in New Mexico, 20.6.4 NMAC

The state has set a number of water-quality standards for interstate and intrastate streams in New Mexico.

The water-quality standards for interstate and intrastate streams in New Mexico do not apply to WIPP because there are no streams, either intermittent or permanent, that will be affected by WIPP.

29.2.11 Utility Operator Certification, 20.7.4 NMAC

The state requires that operators of public water supply systems and public wastewater facilities be certified to the educational and experience requirements of 20.7.4 NMAC.

Under these regulations, WIPP is considered a public water supply system. WIPP is classified as a Class 2 public water supply system because of the population served, 501 to 5,000.

WIPP is also considered a Class 1 public wastewater facility because of the population served and the treatment process being raw wastewater lagoons.

Since these systems at WIPP require certified operators, the MOC employs operators and supervisors certified to the section's requirements. All operators undergo recertification and training every three years; training and certification records are maintained by the MOC at the WIPP facility.

29.3 Compliance Status of the Permit Requirements

The following text summarizes the specific and general requirements from the Discharge Plan for WIPP and their compliance status.

29.3.1 Requirements for Reporting Discharge Volumes, Water Sources, and Quarterly Reports, DP-831 Conditions for Approval (CA) 1

The WIPP shall measure the volume of sewage effluent discharged to the facultative lagoon system and the volumes of nonhazardous brine water individually discharged to the north evaporation cell and the H-19 evaporation pond. The origins of all waters discharged to the north evaporation cell and the H-19 evaporation pond shall be specifically described and reported. Reports of the volumes and water sources will be submitted to NMED by January 31, April 30, July 31, and October 31 of each year.

The reporting of discharge volumes and water sources required by the NMED Discharge Plan Approval DP-381 has been conducted as required. The results have been submitted in the quarterly Discharge Monitoring Reports on April 30, July 31, and October 31 of 2000; January 31, April 30, July 31, and October 31 of 2001; and January 31, 2002.

29.3.2 Requirement for Water Quality Analysis Submitted With Quarterly Report, DP-831 CA 2

WIPP shall sample and analyze the inflow to the facultative lagoon system for nitrate as nitrogen (NO₃-N); total Kjeldahl nitrogen; TDS, plutonium 238, 239/240; americium 241; uranium 234, 235, 238; strontium 90; and gross alpha particle activity (including radium 226, but excluding radon and uranium). WIPP shall sample and analyze the north evaporation pond (Pond B), the south evaporation pond (Pond C), and the H-19 evaporation pond for TDS; plutonium 238, 239/240; americium 241; uranium 234; 235,238; strontium 90; and gross alpha particle activity. If gross alpha activity is greater than 15 pCi/l then additional samples for radioactivity, as combined radium 226 and radium 228, will be collected and analyzed within 30 days of the initial analysis. Reports of the analysis shall be submitted to NMED by January 31, April 30, July 31, and October 31 of each year.

Water quality analyses for these analytes have been submitted with the quarterly reports on April 30, July 31, and October 31 of 2000; January 31, April 30, July 31 and October 31 of 2001; and January 31, 2002.

29.3.3 Requirement for Reporting Volume and Origin of Miscellaneous Nonhazardous Discharges, DP-831 CA 3

The CAO [now CBFO] shall notify NMED of the volume and origin of all wastewater to be discharged that is derived from miscellaneous nonhazardous sources.

The volume and origin of all wastewater discharged derived from miscellaneous nonhazardous sources has been submitted with the quarterly reports on April 30, July 31, and October 31 of 2000; January 31, April 30, July 31 and October 31 of 2001; and January 31, 2002.

29.3.4 Authorization to Discharge, DP-831 Specific Requirement 1

WIPP is authorized to discharge up to 23,000 gpd of sewage effluent to the 5 synthetically lined lagoons for solids settling and evaporation. WIPP can also discharge up to 100 gallons per year of neutralized acid solution to the lagoons.

The discharge volumes of the sewage effluent and the discharge volumes and pH of the neutralized acid solution are measured, recorded, and reported quarterly. Discharges have been maintained below permit limits.

29.3.5 Authorization to Discharge, DP-831 Specific Requirement 2

WIPP is authorized to discharge up to 2,000 gpd of nonhazardous brine water to the synthetically lined north evaporation cell.

The discharge volumes are measured, recorded, and reported quarterly. Quarterly reports were submitted on April 30, July 31, and October 31 of 2000; January 31, April 30, July 31, and October 31 of 2001; and January 31, 2002. Discharges have been below permit levels.

29.3.6 Authorization to Discharge, DP-831 Specific Requirement 3

WIPP is authorized to discharge up to 8,000 gpd of nonhazardous brine water to the synthetically lined H-19 evaporation pond.

The discharge volumes are measured, recorded, and reported quarterly. Quarterly reports were submitted on April 30, July 31, and October 31 of 2000; January 31, April 30, July 31, and October 31 of 2001; and January 31, 2002. Discharges have been maintained below permit limits.

29.3.7 Maintenance of Berms, DP-831 Specific Requirement 4

WIPP will maintain all berms surrounding the facultative lagoon system to protect against storm water run-on and runoff.

The berms are inspected and maintained annually and after a severe rain storm to protect against storm water run-on and runoff, in accordance with MOC procedures.

29.3.8 Contingency Plan Required, DP-831 Specific Requirement 5

WIPP will implement the RCRA Contingency Plan, dated December 16, 1996, in the event of a failure of the waste water treatment and disposal system.

In the event of a failure, the RCRA Contingency Plan will be implemented as described in Part 17 of the NMED Ground Water Discharge Permit Application dated December 16, 1996. The DP-831 is in effect until July 2002.

29.3.9 Facility Closure Plan Required, DP-831 Specific Requirement 6

WIPP will implement the closure plan, dated December 16, 1996, when the facility is decommissioned.

The closure plan will be implemented as described in Part 19 of the NMED Ground Water Discharge Permit Application dated December 16, 1996.

29.3.10 General Requirement, *Monitoring and Reporting*, DP-831

Monitoring and reporting shall be as specified in the discharge plan and supplements thereto.

Monitoring is conducted and reports are submitted to the NMED quarterly on April 30, July 31, and October 31 of 2000; January 31, April 30, July 31 and October 31 of 2001; and January 31, 2002.

29.3.11 General Requirement, *Record Keeping*, DP-831

The discharger shall maintain at the facility, a written record of groundwater and wastewater quality analyses at the facility. The information shall be recorded and made available to the NMED upon request.

Monitoring, reporting, and record-keeping requirements are met as specified in the Discharge Plan.

29.3.12 General Requirement, *Inspection and Entry*, DP-831

The discharger shall allow the NMED Secretary or his authorized representative, upon the presentation of credentials, to enter the discharger's facility during regular business hours or at other reasonable times under the conditions of this discharge plan.

The NMED did not request entry to the facility for inspection of DP-831 during this reporting period. The NMED did not perform any inspections pursuant to the discharge plan during this reporting period.

29.3.13 General Requirement, *Duty to Provide Information*, DP-831

The discharger shall furnish to the NMED, within a reasonable time frame specified by the NMED, any relevant information which it may request to determine whether cause exists for modifying, terminating, and/or renewing this discharge plan or to determine compliance with this plan. The discharger shall furnish to the NMED, upon request, copies of records required to be kept by this Discharge Plan.

No requests have been received from the NMED to provide information relevant to the Discharge Plan. Similarly, the NMED has not requested copies of the records to be maintained under the terms of the Discharge Plan during this reporting period.

29.3.14 General Requirement, *Spills, Leaks, and Other Unauthorized Discharges*, DP-831

Any unauthorized discharges must be reported to the NMED and remediated as required. This requirement applies to all seeps, spills, and/or leaks discovered from the sewerage lagoons or that may directly or indirectly leave the boundaries of the WIPP site.

Any spills, leaks, and other unauthorized discharges are reported to the NMED and remediated in accordance with MOC procedures. No such unauthorized discharges have occurred during this reporting period.

29.3.15 General Requirement, *Retention of Records*, DP-831

The discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least five years from the date of the sample collection, measurement, report, or application.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

All monitoring information, analytical results, monitoring reports, and data used to complete the discharge plan application will be retained for at least five years.

29.3.16 General Requirement, *Modifications and/or Amendments*, DP-831

The discharger must notify the NMED of any modifications or additions to the applicant's wastewater disposal system, including any increase in wastewater flow rate and wastewater storage and disposal management changes to the system as approved under this discharge plan. The discharger shall obtain the NMED's approval, as a discharge plan modification, prior to any increase in the quantity or concentration of constituents in the wastewater above those approved in this plan.

No modifications or additions to the wastewater disposal system requiring NMED notification were planned during this reporting period.

30.0 NEW MEXICO DRINKING WATER REGULATIONS

30.1 Summary of the Regulations

Like the SDWA, the New Mexico DWRs (20.7.10 NMAC) provide a regulatory strategy for protecting public water-supply systems within the state. This section identifies the various categories of water-supply systems and establish operating requirements for each system. It also establishes the maximum contaminant levels for water-supply systems and implement monitoring and analytical requirements for each system.

The DWRs were formerly implemented by the New Mexico Water Supply Regulations, Part III.

30.2 Compliance Status of the Regulatory Requirements

The NMED notified WIPP on September 9, 1992, that the WIPP water supply system is considered a public water supply and classified the system as a nontransient, noncommunity water supply for reporting and testing under the requirements of the SDWA. The CBFO has corresponded with the NMED since the original letter of September 9, 1992, which identified WIPP as a nontransient, noncommunity water supply system, to obtain a determination of the specific SDWA sampling requirements for the site. This direction was requested because WIPP obtains raw water from the Double Eagle Water Line, which is owned and operated by the city of Carlsbad.

On March 11, 1994, the NMED Carlsbad Field Office provided specific direction on the type of SDWA sampling required for the WIPP water supply system. The letter references 20.7.10.300.J NMAC, of the New Mexico DWR, which states:

When a public water system supplies water to one or more other public water supply systems, the Department may modify the

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

compliance sampling requirements imposed by the regulations to the extent that the interconnection of the systems justifies treating them as a single system for compliance sampling purposes.

The NMED went on to determine that "since the Carlsbad Municipal Public Water Supply (WSS206-08) provides WIPP with its water and since Carlsbad already tests the various constituents at each Double Eagle well field source, WIPP is exempted from taking these samples." The NMED then determined that WIPP is required to obtain point-of-use system samples, including lead, copper, and total coliform bacteria.

The specific requirements that are applicable to WIPP and the compliance status of each are provided in the text.

30.2.1 Maximum Microbiological Contaminant Level, 20.7.10.200.E NMAC

The maximum contaminant level for total coliform bacteria is based on the presence or absence of total coliforms in a sample rather than on coliform density. For a system that collects fewer than 40 samples per month, the system is in compliance with the total coliform maximum contaminant level if no more than one sample collected during the month is total coliform positive.

Analyses for total coliform bacteria (i.e., *Escherichia coli*) are performed at WIPP on a monthly basis. The laboratory submits the results to WIPP and to the NMED. To date, coliforms have remained below the maximum contaminant level.

30.2.2 Cross-Connections, 20.7.10.200.H(9) NMAC

No physical connection between a public water supply and any water-supply source not regulated by the NMED is allowed unless the public water-supply system is protected by a back-flow prevention device that has been reviewed by the NMED and is listed by an appropriate listing agency.

The MOC maintains a cross-connection control program. In July 1997, an Environmental Compliance Assessment (ECA-97-007) was conducted to evaluate the site cross-connection control system at WIPP. During this assessment a potential cross-connection between the fire water systems and the site domestic water system was noted. The corrective actions were completed in March 1999. The MOC identified a potential cross-connection on the firewater tank. A backflow prevention device will be installed in fiscal year 2003.

30.2.3 Sampling Certificates, 20.7.10.300.A(5) NMAC

All persons who collect compliance samples for water-supply samples must possess a current Sampling Certificate issued by the Secretary of the NMED. Sampling Certificates are issued only

to persons who have successfully completed an approved training course and have passed an examination that is administered periodically by the NMED. Sampling Certificates are valid for three years.

All WIPP personnel involved with water-supply sampling to ensure compliance with the DWR have completed the New Mexico water-sampling training course and have current Sampling Certificates.

30.2.4 Compliance Sampling, 20.7.10.300.B NMAC

Public water-supply systems must collect total coliform samples at sites that are representative of water throughout the distribution system according to their approved written sampling plan.

The minimal number of samples required per month is based on the population served by the system. Only one sample per month is required by a water-supply system that serves an average daily population of 25 to 1,000.

Samples are collected from sites that are representative of water throughout the distribution system. This technique is covered in the MOC procedures for coliform sampling of WIPP drinking water.

Fewer than 1,000 people are served by the water-supply system at WIPP. At least one sample is collected per month for total coliform bacteria analysis.

30.2.5 Laboratories, 20.7.10.300.I NMAC

Compliance samples may be considered only if they have been analyzed by a laboratory that is acceptable to the NMED.

Lead and copper samples are analyzed by the Scientific Laboratory Division of the NMED and the soil, water, and air testing laboratory of New Mexico State University. Total coliform samples are analyzed by the city of Carlsbad waste water laboratory. All the laboratories are accepted by the NMED.

30.2.6 Sampling of Consecutive Public Water-Supply Systems, 20.7.10.300.J NMAC

When a public water-supply system provides water to one or more other public water-supply systems, the NMED may modify the compliance sampling requirements imposed by these regulations. Any modified compliance sampling shall be conducted in accordance with the schedule specified by the NMED.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

The water-supply system at WIPP receives its water from the public water-supply system of the city of Carlsbad. Carlsbad is responsible for all well-source sampling. Therefore, the NMED has modified the compliance sampling requirements for WIPP and requires sampling only for lead, copper, and total coliform bacteria.

Per the requirements set forth in 20.7.10.X(1001)(c)(1) NMAC, "the lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with §1007 is greater than 0.015 mg/l."

Per the requirements set forth in 20.7.10.X(1001)(c)(2) NMAC, "the copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with §1007 is greater than 1.3 mg/l."

The CBFO requested, and the NMED granted, reduced monitoring status at WIPP. Because of reduced monitoring status for lead and copper, sampling frequency was reduced from ten samples annually to ten samples every three years. Total coliform bacteria sampling is unaffected by this action and samples are collected once a month as required by the NMED. The first triennial compliance sampling was conducted on July 13, 1999. The results were below action levels and were reported to the NMED on August 18, 1999. The next sampling event is scheduled for July 22, 2002, and the data will be sent to the NMED by July 31, 2002. Analytical results will be included in the next BECR.

30.2.7 Reporting Requirements, 20.7.10.400.A NMAC

Unless a shorter period is specified, the water supplier shall provide a copy of the results and data required to the appropriate NMED field office within 10 days after analysis.

Analytical reports for lead and copper are submitted to the appropriate NMED field office within 10 days of their receipt by MOC personnel and directly by the laboratory. The analytical laboratory that analyzes total coliform bacteria sends a copy of the results and data directly to WIPP and to the appropriate NMED field office.

30.2.8 Record Maintenance, 20.7.10.400.C NMAC

A water supplier shall retain the appropriate records on or near the premises of the public water-supply system. Records of bacteriological and chemical analyses shall be kept for at least five and ten years, respectively. The information that must be retained includes the date, place, and time of sampling; the name of the person who collected the sample; identification of the sample; date of analysis and name of the laboratory and person who performed the analysis; the analytical method used; and the results of the analysis.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

All applicable records pertaining to the sampling and analysis and the analytical results are maintained as quality records by the MOC.

31.0 NEW MEXICO HAZARDOUS CHEMICALS INFORMATION ACT

31.1 Summary of the Law

The New Mexico Hazardous Chemicals Information Act (HCIA) (§§74-4E-1 through 74-4E-9 NMSA 1978) was enacted to ensure that current information on the nature and location of hazardous chemicals is available to LEPCs, emergency responders, and the public as required by SARA Title III. The HCIA created the SERC and directs facility owners or operators to notify the New Mexico Department of Public Safety under certain conditions, including the presence of extremely hazardous substances at or above a specified quantity at a facility and the release of any chemical substance that has occurred at or above RQs determined by the state. The HCIA specifies reports to be submitted to the state, including toxic chemical release and hazardous material inventory reports.

31.2 Compliance Status of the Regulatory Requirements

The text provides more detail for each applicable requirement and its compliance status under the HCIA.

31.2.1 Notice of Extremely Hazardous Substance, §74-4E-5(A)(1)

Facility owners or operators must notify the state safety department that an extremely hazardous substance, at or above the threshold planning quantity, is present at a facility.

The CBFO submits a list of hazardous chemicals to the SERC, the LEPC, and all local fire departments with which WIPP maintains an MOU whenever additional substances are received above the TPQ, or 10,000 pounds; or if significant new information is received about an item for which a list was provided. A revised list of hazardous chemicals was submitted to these organizations in August 1999. The listing comprised extremely hazardous substances present in amounts equal to or greater than the Threshold Planning Quantity or 500 pounds, whichever is less, and all substances classified as hazardous under the Occupational Safety and Health Act Hazard Communication Standard with site inventories equal to or greater than 10,000 pounds.

31.2.2 Notice of Release of Chemical Substance(s), §74-4E-5(A)(2)

Facility owners or operators must notify the state safety department of the release of a chemical substance when the release is at or above the RQ of the substance.

In May 2001, a release of lead was reported to the National Response Center, the SERC, and the Eddy County LEPC. Subsequent analysis of the release determined

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

that it was not reportable under CERCLA, or any other regulations, due to the lead particle size and the containment of the release to the WIPP property. Appropriate remediation of the release was completed. Soil samples showed no elevated lead levels and confirmed completion of clean-up activities. Follow-on reports sent to the three agencies explained the actions taken at the release location and the basis for the nonreportable determination. No further actions are required at this location.

31.2.3 Hazardous Material Inventory, §74-4E-5(A)(3)

Facility owners or operators must submit to the state an inventory form containing Tier II information on or before March 1 of each year.

The CBFO submitted the Emergency and Hazardous Chemical Inventory Report (Tier II Report) in February 2001 and February 2002 to the SERC, the LEPC, and all local fire departments.

31.2.4 Toxic Chemical Release Inventory, §74-4E-5(A)(4)

Facility owners or operators employing at least 10 employees and with a covered Standard Industrial Classification (SIC) code must submit a toxic chemical release form on or before July 1 of each year to the state safety department.

WIPP's SIC code, 4953, is a covered SIC code. However, during this reporting period WIPP was exempt from submitting a Toxic Release Inventory report because the use of toxic chemicals at WIPP fell under the exemptions described in 40 CFR §372.38, "Exemptions."

Effective February 16, 2001, the EPA lowered the reporting thresholds for lead and lead compounds to 100 pounds. Excluded in this lowered threshold is any lead contained in stainless steel, brass, and bronze alloys. The lowered thresholds applied for Toxic Release Inventory reports for the year 2001. During the reporting year 2001, the WIPP facility did not exceed the lowered thresholds for lead and lead compounds.

32.0 NEW MEXICO EMERGENCY MANAGEMENT ACT

32.1 Summary of the Law

The New Mexico Emergency Management Act (EMA) (§§74-4B-1 through 74-4B-14 NMSA 1978) was enacted to ensure the adequacy of hazardous material emergency management capabilities in the state to protect the health and safety of New Mexico citizens and the environment. The act delineates those state agencies that are responsible for responding to hazardous material accidents and providing control and management of such accidents. The act also provides for the formulation of a comprehensive hazardous materials emergency management plan.

32.2 Compliance Status of the Regulatory Requirements

The text provides more detail on the compliance status of each requirement under the Emergency Management Act.

32.2.1 State Police Emergency Response Officer; Procedure for Notification; Cooperation of Other State Agencies and Local Governments, §74-4B-5

State Police Emergency Response Officers shall be designated, trained, and available to answer an emergency response call from the first responder. The responsibilities of these officers and of the State Police Emergency Response Center are described. Any driver of a vehicle carrying hazardous materials involved in an accident which may cause injury to persons or property or any owner, shipper, or carrier of hazardous materials involved in an accident who has knowledge of such accident or any owner or person in charge of any building, premises, or facility where such an accident occurs shall immediately notify the New Mexico State Police Division of the Public Safety Department by the quickest means of communication available.

Should an accident involving hazardous materials occur, the New Mexico State Police Division of the Public Safety Department will be notified by the driver, owner, shipper, or carrier of the waste as outlined in an MOC procedure and the Carrier Management Plan. In the event of an accident involving a TRUPACT-II container, contact to the Central Monitoring Room operator will be made through TRANSCOM. The Central Monitoring Room operator will then contact the state police and other appropriate agencies.

WIPP personnel will contact the SERC in the event of a spill that could endanger human health or the environment. The SERC will, in turn, contact the NMED if their assistance is needed.

No such emergencies occurred during this reporting period.

32.2.2 Clean-Up, §74-4B-10

Nothing in the Emergency Management Act shall be construed to relieve hazardous materials owners, shippers, or carriers of their responsibilities and liability in the event of an accident. Such persons shall assist the state as requested in responding to an accident and are responsible for restoring the scene of the accident to the satisfaction of the state.

The DOE Radiological Assistance Team will take responsibility for site remediation of any occurrences involving TRUPACT-II containers, whether on-site or off-site. The

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Radiological Assistance Team will clean up the accident scene to the affected state's satisfaction.

No such accidents occurred during this reporting period.

33.0 NEW MEXICO PREHISTORIC AND HISTORIC SITES PRESERVATION ACT

33.1 Summary of the Law

The provisions of the Congressional National Historic Preservation Act are furthered by law in the state of New Mexico. The act currently in place is the New Mexico Prehistoric and Historic Sites Preservation Act (§§18-8-1 through 18-8-8 NMSA 1978). The purpose of this act is the acquisition, stabilization, restoration, or protection of significant prehistoric and historic sites by the state of New Mexico and corporations. This act is administered by the SHPO in consultation with the Cultural Properties Review Committee.

The Prehistoric and Historic Sites Preservation Act is implemented by 4.10.12 NMAC, which established procedures for acquiring, stabilizing, restoring, or protecting significant prehistoric and historic sites. Rule 89-2 also established procedures and guidelines to evaluate alternatives to programs and projects requiring the use of land from significant prehistoric and historic sites and to determine whether all possible planning has been implemented to preserve and protect such sites. Detailed requirements for a long-term management plan for any site acquired, stabilized, restored, or protected are included under this rule.

33.2 Compliance Status of the Regulatory Requirements

WIPP is bound by the New Mexico statutes and regulations regarding cultural properties in accordance with edicts provided by the SHPO. WIPP personnel contract for archeological surveys and consult with the SHPO each time an action is proposed that would impact a previously undisturbed area. Detailed instructions for compliance with applicable cultural resource management requirements are contained in the WIPP LMP.

Prior to the issuance of the LWA, the BLM was responsible for archaeological resource management on the WIPP site and served as the DOE's liaison with the SHPO. Following the issuance of the LWA, the BLM continued to serve in this capacity until July 19, 1994, when the MOU between the DOE and the DOI was finalized. At that time, WIPP began communicating directly with the SHPO regarding archeological concerns at WIPP.

One archaeological clearance was conducted during this reporting period. No artifacts were encountered. Appropriate documentation was submitted to the SHPO, and approval to proceed was granted. There were no requests for mitigation submitted to the SHPO during this reporting period.

34.0 NEW MEXICO STATE IMPLEMENTATION OF THE FEDERAL LAND POLICY AND MANAGEMENT ACT

34.1 Summary of the Law

The FLPMA was enacted to ensure that "public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use." Under the FLPMA, the Secretary of the Interior is authorized to grant, issue, or renew rights-of-way over, upon, under, or through public lands.

The spirit and purpose of the congressional legislation to protect and preserve the quality of public lands is furthered by law in the state of New Mexico. In 1912, the New Mexico Legislature created the SLO and directed that the Office's executive officer, the Commissioner of Public Lands (the Commissioner), execute jurisdiction over, and provide for the management, care, control, and disposition of, public lands owned and subsequently acquired by the state. The Commissioner was authorized to grant rights-of-way and easements over, upon, or across state lands for highways, power lines, mining, or other purposes. The Commissioner's authority related to rights-of-way and easements is currently promulgated in New Mexico Statute 19-7-57.

The regulation of right-of-way and easement grants is addressed in the SLO's Rule 10, *Relating to Easements and Rights-of-Way*, which outlines the requirements for applying for and maintaining a right-of-way grant. In February 2002 the SLO's Rule 10 was repealed and replaced with 19.2.10 NMAC.

34.2 Compliance Status of the Regulatory Requirements

The text provides more detail for applicable requirements under 19.2.10 NMAC and the compliance status of each requirement.

34.2.1 Survey Plat, 19.2.10.12NMAC

Specific requirements for the survey plat are described in 19.2.10.12NMAC.

A survey plat was included in the application. The plat met all requirements specified in 19.2.10.12NMAC.

34.2.2 Application Form, 19.2.10.13 NMAC

Written application for right-of-way grants shall be made upon the proper forms. The application fee is set out in the current fee

schedule. The application will contain a legal description of the lands to be burdened and a plat.

The proper application form and the fees required were submitted as required. The application included the legal description of the lands to be crossed and a survey plat.

Permit No. RW-22789 was issued for a high-volume air sampler for the period of October 3, 1985, through October 3, 2020.

34.2.3 Easement of Right-of-Way Dimensions, 19.2.10.16 NMAC

The commissioner shall determine the minimum dimensions of easements and rights-of-way.

As described in the application and survey plat, the right-of-way covers a 40-foot-wide strip of land.

34.2.4 Damage Surety, 19.2.10.18 NMAC

The applicant must file a bond or other security with the commissioner before an easement or right-of-way may be issued. The bond must compensate the state or its lessee for any damage done to improvements or other property. The commissioner may waive this requirement if the applicant is a governmental agency that is prohibited by law from posting a security bond, or is not immune to suit.

The commissioner has waived this requirement since the DOE is a governmental agency.

34.2.5 Construction Reports, 19.2.10.19 NMAC

The holder of an easement or right-of-way shall notify the commissioner immediately in the event any historic or prehistoric ruin, or monument, or any object of historical, archeological, or scientific value is discovered upon or within the easement or right-of-way, and shall refrain from further disturbance of such area until the commissioner has consented in writing.

No ruins, monuments, or artifacts of historical, archeological, or scientific value were discovered upon the right-of-way.

34.2.6 Affidavit of Completion, 19.2.10.20 NMAC

Upon the completion of construction of any easement or right-of-way, the holder of the easement or right-of-way shall file with the commissioner an affidavit of completion. Failure to file such an

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

affidavit in accordance with this section shall subject the easement or right-of-way to termination in accordance with the provisions of this rule.

The CBFO submitted an Affidavit of Completion to the commissioner, certifying the completion of construction and the location of the high-volume air sampler.

34.2.7 Renewal of Easement or Right-of-Way, 19.2.10.24 NMAC

Prior to the expiration date of any easement or right-of-way, an application may be submitted for a renewal of the grant.

Permit No. RW-22789 (see Section 34.3 below) was granted for a term of 35 years. If the right-of-way will still be needed after the expiration date, an application will be submitted as required.

34.2.8 Reclamation and Restoration, 19.2.10.27 NMAC

Any person who enters upon trust lands for purposes of surveying or constructing an easement or right-of-way shall take all steps necessary to preserve and protect the natural environmental conditions of the land, including reclamation of disturbed areas by leveling or terracing and reasonable attempts at revegetation. Revegetation shall include the establishment of suitable grasses and forbs. The grantee of any easement or right-of-way shall consult with the commissioner's designee regarding reclamation prior to undertaking reclamation and shall make reasonable attempts at restoration.

The CBFO will ensure that all reclamation and revegetation activities requested by the commissioner or by his or her designee will be performed. Until these activities have been initiated, these requirements do not apply to WIPP.

34.3 Compliance Status of the Permit Conditions

The commissioner granted Right-of-Way Permit No. RW-22789 to WIPP for a high-volume air sampler. The term of the permit is 35 years (October 3, 1985, through October 3, 2020). The text summarizes the applicable permit conditions and the compliance status of each condition.

34.3.1 Disposal of Brush and Other Debris, Term/Condition 3

In clearing the right-of-way, the grantee agrees to dispose of brush and other debris so as not to interfere with the movement of livestock of state grazing lessees.

All brush and other debris were disposed of appropriately.

34.3.2 Prevention of Destruction or Injury to Improvements or Livestock, Term/Condition 5

The grantee agrees to carefully avoid causing destruction or injury to any improvements or livestock lawfully upon the premises, to close all gates immediately after passing through them, and to make prompt payment of all reasonable and just damages for any injury or destruction arising from constructing or maintaining the right-of-way.

The CBFO and the MOC carefully avoid causing destruction or injury to any improvements or livestock that are lawfully upon the premises. Gates are closed as soon as possible.

34.3.3 Purpose of Right-of-Way, Term/Condition 6

The right-of-way granted is for the sole purpose of providing egress from and ingress to a high-volume air sampler. The right-of-way may not be used for any other purpose and may not be reassigned by the grantee.

The right-of-way granted under this permit is used only for the high-volume air sampler.

34.3.4 Existing Rights, Term/Condition 7

The rights granted under Permit RW-22789 are subject to valid existing rights.

No existing leases or rights-of-way of record are known.

34.3.5 Leases for Mineral Resources, Term/Condition 8

The Commissioner reserves the right to execute leases for oil and gas, coal and minerals; to sell or dispose of same; and to grant rights-of-way and easements related to such leasing.

The land subject to the conditions of Permit RW-22789 (i.e., T 19 S, R 27 E, Section 13) is not part of the land that was withdrawn from the DOI and transferred to the DOE under the LWA (i.e., several sections under T 22 S, R 31 E). This term remains applicable although no action is required by MOC personnel.

34.3.6 Compliance With all Applicable Regulations and Requirements, Term/Condition 9

The grantee and its employees, agents, and contractors shall fully comply with all laws, regulations, and requirements of any governmental authority or agency in all matters that affect the

premises and operations pertaining to such issues as conservation, sanitation, aesthetics, pollution, cultural properties, fire, or ecology.

This BECR addresses compliance with all such laws, regulations, and requirements at WIPP.

34.3.7 Non-Use of the Right-of-Way, Term/Condition 10

If the right-of-way granted is not used for a period that exceeds one year without the prior written permission of the Commissioner, the right-of-way will be considered abandoned. Non-use for shorter periods will require that the grantee prove that there was no intent to abandon the right-of-way.

The right-of-way is used periodically to collect samples and to maintain the sampler.

34.3.8 Protection and Preservation of Natural Environmental Conditions, Term/Condition 13

The grantee agrees to preserve and protect the natural environmental conditions of the land encompassed in this permit and to take such reclamation or corrective actions necessary to protect the land from pollution, erosion, or other forms of environmental degradation.

The land encompassed in this permit is being preserved and protected. In addition, a contemporary reclamation program and a corresponding long-range plan have been implemented at WIPP. When the right-of-way for the high-volume air sampler is to be reclaimed, MOC personnel will use the best acceptable reclamation practices. (See also Subsection 34.3.9 below.)

34.3.9 Reclamation of All Disturbed Areas, Term/Condition 14

The grantee agrees to reclaim all disturbed areas by grading, leveling, or terracing and to landscape these areas at its own expense. Landscaping will include the planting of native grasses, shrubs, or other vegetation so as to return disturbed areas to their natural state and prevent erosion caused by water and/or wind.

The seed mixes to be used to revegetate the area will reflect those species which are indigenous to the vicinity, with priority given to those species of plants that are conducive to soil stabilization and to the needs of livestock and wildlife. (See also Subsection 34.3.8 above.) This section is not applicable to WIPP during this reporting period.

35.0 NEW MEXICO STATE IMPLEMENTATION OF THE BALD AND GOLDEN EAGLE PROTECTION ACT

35.1 Summary of the Law

The Bald and Golden Eagle Protection Act makes it unlawful to take (i.e., capture, kill, or destroy), possess, molest, or disturb living or dead bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), their parts, their nests, or their eggs anywhere in the United States. A permit must be obtained from the DOI to relocate any nest that interferes with resource development or recovery operations. In addition, a permit may be obtained that authorizes taking, possessing, or transporting eagles or their parts, nests, or eggs.

Chapter 17 of the New Mexico statutes establishes rules and regulations to protect raptors. In particular, §17-2-14, "Hawks, vultures and owls, taking, possessing, trapping, destroying, maiming or selling prohibited; exception by permit; penalty," authorizes the Director of the NMDG&F to issue permits to allow any person to take, possess, trap, ensnare, or destroy any bird protected by this section. Permits may be granted for several purposes, including scientific purposes, in accordance with the law and the State Game Commission's regulations. In addition, §§17-2-37 through 17-2-46 of the Wildlife Conservation Act also further the purpose of the Bald and Golden Eagle Protection Act with respect to the bald eagle as an endangered species (see Chapter 37.0 herein).

35.2 Compliance Status of the Regulatory Requirements

At present, no bald or golden eagles are nesting on the WIPP site; however, individual eagles are frequently observed overwintering in the area. No permit regarding bald or golden eagles is required. If it becomes necessary, a permit application will be submitted, and all applicable permit requirements will be met.

36.0 NEW MEXICO WILDLIFE CONSERVATION ACT, SUPPLEMENTING THE ENDANGERED SPECIES ACT

36.1 Summary of the Law

The federal Endangered Species Act was enacted in 1973 to prevent the extinction of many species of animals and plants. The act provides strong measures to help alleviate the loss of species and their habitats. It places restrictions on a wide range of activities involving endangered and threatened animals and plants to help ensure their continued survival. With limited exceptions, the act prohibits activities using these protected species unless authorized by a permit from the FWS.

The intent of the Congressional endangered species legislation is furthered in the New Mexico Wildlife Conservation Act, which was enacted to protect the state's rare animals in 1974 (the New Mexico Endangered Plant Species Act [9-10-10 NMSA] protects rare plants). The current sections of the state's Wildlife Conservation Act

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

reside in §§17-2-37 through 17-2-46 NMSA 1978. The Wildlife Conservation Act directs that endangered species of wildlife that are indigenous to New Mexico should be managed and maintained and, to the extent possible, their numbers enhanced within the carrying capacity of the habitat. The state is directed to assist in the management of endangered and threatened species of wildlife, including those which are federally listed.

Protection under the Wildlife Conservation Act extends to native species, of crustaceans, mollusks, fish, amphibians, reptiles, birds, and mammals that are listed by the State Game Commission in 19.33.6 NMAC.

Section 17-2-41, "Endangered Species," states that "except as otherwise provided in this act, it is unlawful to take, possess, transport, export, process, sell or offer for sale, or ship" any species or subspecies of wildlife that appears on the following lists: (1) wildlife indigenous to the state determined to be endangered within the state as set forth by regulations of the Game Commission of the state of New Mexico (the Commission) and (2) the federal lists of endangered species as set forth in the Endangered Species Act to the extent that such lists are adopted by regulations of the Commission. Section 17-2-38L defines "take" to include harass, hunt, capture, or kill.

In Section 17-2-42, "Management Programs," the Director of the NMDG&F is directed to perform the following: (1) establish programs deemed necessary by the Commission for the management of endangered species; (2) work with federal and state entities or with private individuals in the administration and management of programs for the management of endangered species; (3) authorize by permit the taking, possession, transportation, or shipment of species deemed to need management for purposes including scientific and educational; and (4) authorize by permit the removal, capture, and destruction of endangered species where necessary to prevent damage to property or to protect human health.

The intent of the congressional legislation protecting migratory birds under the Migratory Bird Treaty Act is also addressed in Chapter 17 of the New Mexico statutes. In particular, §17-2-3 NMSA, "Protected wildlife species and game fish defined," specifies that all of the migratory bird family Anatidae (waterfowl) is protected. Section 17-2-14 NMSA addresses the protection of hawks, vultures, and owls. Section 17-2-13 NMSA protects many species of songbirds. The hunting, taking, capturing, killing, or possession or the attempt to hunt, take, capture, or kill these species is regulated by the Commission.

Part 19.33.2 NMAC, "Governing the Removal, Capture or Destruction of Endangered Species," was adopted in 1975. This regulation specifies that any person who does not possess a permit and who removes, captures, or destroys any wildlife species classified as threatened or endangered by Commission regulations, must report any such incident to the NMDG&F.

Part 19.33.6 NMAC, "List of Threatened and Endangered Species," lists threatened and endangered wildlife in the state. The regulation was last amended in 2000. It includes

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

seven species of wild cats as "restricted species," by adoption of the federal list of endangered species.

The amended listing of threatened and endangered wildlife of New Mexico includes a number of endangered or threatened species that could be found at WIPP and were specified in the FEIS (DOE, 1980) or the SEIS (DOE, 1990a). These include two species of reptiles (Western Ribbon Snake, Sand Dunes Lizard) and five species of birds (Aplomado falcon, Peregrine falcon, Bald eagle, Baird's sparrow, Varied bunting).

Part 19.36.2 NMAC, "Regulation for the Taking and Possession of Protected Wildlife for Scientific and Educational Purposes," contains the requirements for obtaining and using state permits and authorizations for taking and possessing wildlife for scientific and educational purposes. Permits and authorizations are issued to individuals rather than to parties or organizations; however, a permittee may have qualified subpermittees. "Protected wildlife" is defined as all wild species of mammals, birds, reptiles, amphibians, and fishes and endangered mollusks and crustaceans taken by a nonresident of New Mexico, or as pikas, marmots, and game, fur-bearing, and endangered mammals; all birds except rock doves, European starlings, and house sparrows; horned lizards if sacrificed, retained, and/or transported out of state; endangered reptiles; bullfrogs and endangered amphibians; game and endangered fishes; and endangered mollusks and crustaceans taken by a resident.

36.2 Compliance Status of the Regulatory Requirements

The text provides a summary for each applicable requirement and its compliance status under the state of New Mexico's Game and Fish Code (Chapter 17 NMSA). It should be noted that a number of these requirements apply to WIPP because of the potential for the occurrence of recognized protected, endangered or threatened species on WIPP lands.

36.2.1 Report of Unpermitted Removal, Capture, or Destruction of Endangered Species, Regulation 19.33.2 NMAC

Persons without an authorized state permit who remove, capture, or destroy a state-listed endangered species must provide detailed information on such incident(s) to the state Game and Fish Department within 30 days.

No incidents requiring reports occurred during the reporting period. Several permits and authorizations have been issued for various activities involving the taking of wildlife that are neither endangered nor threatened. These permits and authorizations specify that endangered wildlife shall not be taken during these activities (see Section 36.3 below).

36.2.2 Recognition of State-Listed Endangered Wildlife, Regulation 19.33.6 NMAC

The state-listed threatened and endangered species that could be present at WIPP and/or affected by WIPP activities must be identified.

In 1989, the DOE consulted with the NMDG&F regarding the state-listed endangered species in the vicinity of the WIPP site. At that time, the department communicated to the DOE their opinion of which state-listed endangered species "occur or are likely to occur at the WIPP site." The species identified were listed in Regulation No. 657, dated January 9, 1988, and included the following species: Mississippi kite, bald eagle, peregrine falcon, least tern, willow flycatcher, Bell's vireo, Baird's sparrow, and the sand dune lizard. The NMDG&F subsequently concurred that proposed WIPP activities would probably have no significant impacts on state-listed species in the area. Regulation No. 682 was updated on November 30, 1990, with Amendment No. 1 issued on July 25, 1991. Regulation 682 was replaced by 19.33.1 NMAC, which was last amended in 2000 and recodified as 19.33.6 NMAC. This list does not include the Mississippi kite. The CBFO received the most recent list of threatened and endangered species delineated by county and currently uses this list when considering land-use proposals.

36.2.3 Permit Application and Requirements to Conduct Activities Authorized Under Regulation 19.36.2 NMAC

A person must complete and submit a permit or authorization application; after receipt of the permit, permittees and subpermittees must comply with written permit requirements.

To date, two permits have been issued. More detail on these permits is provided in Section 36.3 below.

36.2.4 Year-End Reports, Regulation 19.36.2 NMAC

An annual report is generally required for permits issued by the Department of Game and Fish. The permits must be filed by March 31.

Annual reports are submitted that describe the activities conducted under each permit issued by the NMDG&F.

36.3 Compliance Status of the Permit Conditions

The text provides a summary of the conditions imposed by the NMDG&F for each of the two permits issued and the compliance status of each permit condition.

36.3.1 Permit No. 1894

Permit No. 1894 authorizes the permittee and subpermittees specified to use live traps, trotlines, and nets (except gill nets) to obtain specimens and to salvage dead, injured, or otherwise incapacitated vertebrates. The authorized MOC personnel may take up to 30 specimens of quail, 50 channel/flathead catfish, and unprotected vertebrates as needed in Eddy and Lea counties. Nonlethal methods must be used to take the catfish. Any endangered or threatened species salvaged must be reported to the NMDG&F within 14 days. WIPP is the ultimate disposition location for all specimens retained under this permit.

Permit No. 1894 is issued annually. No gill nets have been used to obtain specimens. The allowable number of channel/flathead catfish is 50 specimens. Methods used to capture the catfish are not lethal to these fish or to other aquatic vertebrates. No endangered or threatened species have been salvaged.

36.3.2 Permit No. 1961

Permit No. 1961 authorizes the designated permittee and subpermittees to live-capture, band, and release all protected species of birds except for waterfowl, eagles, resident gallinaceous game birds, and endangered or threatened species. Salvage of any dead, injured, or otherwise incapacitated members of an endangered or threatened species must be reported to the NMDG&F within 14 days. The ultimate disposition of all protected wildlife that is not released is to the Carnegie Museum of Natural History, New Mexico State University, or the University of Arizona.

Permit No. 1961 is issued annually. The ultimate disposition of any protected species allowable under this permit resides in New Mexico State University, or the University of Arizona, as specified in the permit.

37.0 NEW MEXICO PESTICIDE CONTROL ACT

37.1 Summary of the Law

The Pesticide Control Act (§§76-4-1 through 76-4-30 NMSA 1978) is administered and enforced by the New Mexico State Department of Agriculture under the direction of the Board of Regents of New Mexico State University, Las Cruces, New Mexico. This act provides for the registration, labeling, distribution, storage, transportation, application, use, and disposal of pesticides and pesticide-related devices. It also provides for the licensing of pesticide dealers, consultants, applicators, and operators of pesticide apparatus and imposes penalties to protect the environment and the public health and welfare.

The Pesticide Control Act is implemented by two regulatory orders of the Board of Regents of New Mexico State University. Regulatory Order No. 4, "Regulatory Orders of the Board of Regents of New Mexico State University" (dated September 16, 1978), describes state requirements for the storage of pesticides and the disposal of pesticide wastes. Regulatory Order No. 5, "Definitions, Licensing, Equipment Inspection, Record Keeping of Pesticides by Regulated Applicants" (dated November 2, 1979), describes requirements for licensing and for applying pesticides in New Mexico and applies to all activities involving the distribution and use of pesticides in the state.

37.2 Compliance Status of the Regulatory Requirements

The compliance status of each of the major requirements of the implementing regulations of the Pesticide Control Act is provided in the text.

37.2.1 Storage of Pesticides and Disposal of Pesticide Wastes, Section 5 of Regulatory Order No. 4

Requirements for storing pesticides and for disposing of pesticide wastes and pesticide containers are described in Section 5 of Regulatory Order No. 4 to the New Mexico Pesticide Control Act.

All restricted-use pesticides are brought on-site by the subcontractor who has been hired to apply them. Storage and disposal of restricted-use pesticides and their containers are the responsibility of the subcontractors who are licensed by the state and knowledgeable of applicable requirements (see also Subsection 10.2.2 herein). General-use pesticides are properly stored at WIPP in accordance with the product label. Used, empty aerosol cans are managed as hazardous waste.

37.2.2 License Classification, Section 6 of Regulatory Order No. 5

There are 17 categories of licenses granted by the state of New Mexico. Each one represents the type and scope of the specific certification examinations that must be taken by commercial, noncommercial, and public applicators and by pest-management consultants for their licenses.

The contractor who applies pesticides at WIPP is licensed under the following categories:

- 3A - Ornamental Pest Control
- 3B - Turf Pest Control
- 7A - Structural Pest Control
- 7B - Rodent Control
- 7D - Termite Control

37.2.3 Protective Equipment, Section 10 of Regulatory Order No. 5

All licensed certified applicators must make available properly decontaminated protective equipment which is in proper working order and must advise their employees of its use to meet the safety requirements of the pesticide labeling.

The MOC is not a certified applicator. All pesticide application is done by subcontractors. All pesticide application contracts are reviewed and approved by the MOC before the contract is awarded. Provisions in the contract require that the MOC approve the use of all pesticides prior to application on-site. In addition, the contractor is required to submit records of the date of application, specific location, application method, quantity applied, and weather conditions at time of application.

Personal protective equipment is supplied by the subcontractor.

37.2.4 Application of Pesticides, Section 11 of Regulatory Order No. 5

A licensed certified applicator shall apply only those pesticides registered for use in New Mexico under his or her license application. Any person who applies pesticides must follow the directions, rates, and precautions that are stated on the approved label and labeling. Restricted-use pesticides shall be applied only by licensed certified applicators or persons under their direct supervision.

The MOC reviews the application methods and pesticides to be used by the subcontractor before the application to ensure that the method is appropriate and that no pesticides on the EPA's restricted list will be used.

A copy of the subcontractor's current license is maintained by the MOC.

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Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

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Caviness, M. L. to Tiktinsky, D. H. Letter, Report Pursuant to 10 CFR 71.95(c), April 1, 2002.

Donovan, K. S. to D. Brinkerhoff. Letter, Manifest Exception Reporting, February 2, 2000.

IT Corporation. Emission Sampling Report, Backup Diesel Generator, March 24, 1994.

NOTE: The following documents are current as of March 31, 2002.

Document No.	Document Title
WP 02-EC.02	Special Waste Management Plan
WP 02-EC.04	Management of Hazardous Materials Plan
WP 02-EC.05	Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling
WP 02-EC.06	WIPP Site Effluent and Hazardous Materials Sampling Plan
WP 02-EC.08	National Environmental Policy Act Compliance Plan

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Document No.	Document Title
WP 02-EC.09	WIPP Spill Prevention, Control, and Countermeasures Plan
WP 02-EC.10	WIPP National Pollutant Discharge Elimination System Storm Water Pollution Prevention Plan
WP 02-EC.11	Waste Isolation Pilot Plant Pollution Prevention Program Plan
WP 02-EC.0	Environmental Management System Implementation Document
WP 02-EC1001	Characterization Sampling, Shipping, and Documentation
WP 02-EC3201	Environmental Compliance Assessment Program
WP 02-EC3506	Environmental Incident Reporting
WP 02-EC3801	NEPA Compliance
WP 02-1	WIPP Groundwater Monitoring Program Plan
WP 02-EM1001	Sewage Lagoon Sampling
WP 02-EM1005	Groundwater Serial Sample Analysis
WP 02-EM1009	Soil Sampling for Radiological Analysis
WP 02-EM1011	Biotic Sampling
WP 02-EM1012	Airborne Particulate Sampling
WP 02-EM1014	Groundwater Level Measurement
WP 02-EM1016	Request to Discharge to Evaporation Ponds
WP 02-EM1017	Surface Water and Sediment Sampling for Radiological Analysis
WP 02-EM1019	Vegetation Sampling
WP 02-PC.02	Delaware Basin Drilling Surveillance Plan
WP 02-PC.03	WIPP Hazardous Waste Permit Reporting and Notifications Compliance Plan
WP 02-PC3001	WIPP Hazardous Waste Facility Permit Screening
WP 02-PC3002	RCRA Permit Change - Screening Approval and Modification Processing
WP 02-RC.01	Site-Generated, Non-Radioactive Hazardous Waste Management Plan
WP 02-RC.04	RCRA Training Documentation
WP 02-RC3109	Satellite Accumulation Area, Hazardous Waste Storage Area, and Universal Waste Storage Area Inspections
WP 02-RC3502	Used Oil Management
WP 04-AD3008	Shift Operating Logs
WP 04-AD3027	TSR Violation Reporting and Recovery Plan
WP 04-CO	Conduct of Operations
WP 04-MD3003	Control of Operator Aids
WP 04-PC3017	Essential Plant Communication Systems Testing
WP 04-AU1026	Self-Rescuer Inspection
WP 04-CA4001	Compressed Air System Alarm Response
WP 04-CM1002	TRANSCOM: Routine Operations for the CMRO
WP 04-CM1301	Public Address System Console Operation
WP 04-CM2002	Central Monitoring Room Operator's Actions for Transportation Irregularities
WP 04-EM1301	Surface Seismic Monitoring System Operation
WP 04-EM1302	Quarterly Operational Test of Surface Seismic Monitoring System
WP 04-EM1601	Underground Seismic Monitoring System Operation
WP 04-EM4200	Radiation Monitoring System Alarm Response
WP 04-FP1201	Site Fire Water Supply System Operations
WP 04-GC1201	Sewage Lagoon System Operation

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Document No.	Document Title
WP 04-HO4002	Salt Hoist Alarm Response
WP 04-HO4003	Waste Handling Hoist Alarm Response
WP 04-HO4010	Mine Hoist Emergency Responses
08-PT3001	Type "B" Packaging Maintenance Program
WP 05-WH1001	TRUPACT-II Loading
WP 05-WH1011	CH Waste Processing
WP 05-WH1036	Site-Derived Mixed Waste Handling
WP 05-WH1083	TRUPACT-II Operations
WP 05-WH1101	Surface Transuranic Mixed Waste Handling Area Inspections
WP 05-WH1810	Underground Transuranic Mixed Waste Disposal Area Inspections
WP 05-WH3015	Site Derived Mixed Waste Management
WP 05-WH4401	Waste Handling Operator Event Response
08-NT.01	WIPP Waste Information System Program and Data Management Plan
WP 06-HM1108	Construction Landfill Operation
WP 06-HM3107	Transportation: 24-Hour Emergency Response
WP 06-HM3111	Return of TRU Waste to the Generator
WP 08-NT3101	Shipment of Nonradioactive Hazardous Materials
WP 08-NT3102	Shipment of Hazardous Materials by Air
WP 08-NT3103	Shipment of Nonradioactive Hazardous Waste
WP 08-NT3110	Shipment of Radioactive Materials
WP 09-CN3007	Engineering and Design Document Preparation and Change Control
WP 09-CN3018	Design Verification
WP 09-CN3023	Design Classification Determination
WP 09-DC.01	Construction Management Manual
WP 09-TM1001	TRUPACT-II Upper Main O-Ring Seal Batch Test
WP EA10-2-8-0	Job Hazard Analysis Checklist
WP 10-WC.01	Cross-Connection Control Program
WP 10.WC.02	Predictive Maintenance Program
WP 10-WC3008	Facility Inspections
WP 10-WC3009	Aerosol Can Puncturing
WP 12-3	Dosimetry Program
WP 12-DS1361	Bioassay Scheduling, Sampling, Shipping, and Analysis Results Receipt
WP 12-DS1366	Calculation of Internal Dose and Internal Dose Assessment
WP 12-DS3304	Radiation Work Restriction
WP 12-4	WIPP Radiological Assistance Plan
WP 12-ES3918	Reporting Occurrences in Accordance with DOE Order 232.1A
WP 12-9	Waste Isolation Pilot Plant Emergency Management Program
WP 12-ER3002	Emergency Operations Center (EOC) Activation
WP 12-ER3903	Event Recovery
WP 12-ER3904	Categorization and Classification of Operational Emergencies
WP 12-ER4901	Severe Weather Response
WP 12-ER4902	Hazardous Material Spill and Release Response
WP 12-ER4903	Radiological Event Response
WP 12-ER4905	Security Emergency Response

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Document No.	Document Title
WP 12-ER4906	Surface Medical Emergency
WP 12-ER4907	Evacuation/Sheltering in Place
WP 12-ER4908	Surface Fire Response
WP12-ER4910	Earthquake/Seismic Response
WP 12-ER4911	Underground Fire Response
WP 12-ER4912	Underground Medical Emergency Response
WP 12-FP.01	Fire Protection Program
WP 12-FP3002	Hot Work Permits
WP 12-5	Waste Isolation Pilot Plant Radiation Safety Manual
WP 12-HP1225	Calibration of Continuous Air Monitors
WP 12-HP2001	Abnormal Radiological Conditions
WP 12-HP3000	Radiological Control (RC) Administration
WP 12-HP3125	Instructions for Periodic Confirmatory Sampling Compliance Reporting
WP 12-HP3200	Radioactive Material Control
WP 12-HP3300	Radiation Exposure Control
WP 12-HP3400	Contamination Control
WP 12-HP3500	Airborne Radioactivity
WP 12-HP3700	Radiological Event Reporting
WP 12-HP4000	Emergency Radiological Control Responses
WP 12-IH.01	WIPP Chemical Hygiene Plan
WP 12-IH.02	Waste Isolation Pilot Plant Industrial Hygiene Program
WP 12-IS.01	Industrial Safety Program
WP 12-IH1006	Airborne Contaminant Sampling
WP 12-NS.01	Changes to the WIPP Safety Analysis Report
WP 12-NS3003	Safety Analysis Calculation
WP 12-2	WIPP ALARA Program Manual
WP 12-RC.01	Quality Assurance Project Plan for Sampling Emissions of Radionuclides to the Ambient Air at the Waste Isolation Pilot Plant
WP 12-RL1009	Gross Alpha and Gross Beta Activity in Air Filter, Soil, Water, Sludge, and Biota
WP 12-RL1400	Radiochemistry Laboratory Waste Management
WP 12-SA3130	Reporting Occupational Injuries and Illnesses
WP 12-VC.01	Confirmatory Volatile Organic Compound Monitoring Plan
WP 12-VC.02	VOC Monitoring Quality Assurance Project Plan for Volatile Organic Compound Monitoring
WP 13-1	Westinghouse TRU Solutions LLC Quality Assurance Program Description
WP 13-QA1080	TRUPACT-II Assembly Verification Leak Tests
WP 13-QA1082	TRUPACT-II Container Integrity Leak Test
WP 13-QA3003	Corrective Actions Program
WP 13-QA3007	External Oversight Activities
WP 14-TR.01	WIPP Training Program
WP 15-MD3100	Lessons Learned Program
WP 15-MD3102	Event Investigation and Root Cause Analysis
WP 15-HS.01	OSHA Bloodborne Pathogens Exposure Control Plan
WP 15-HS.02	WIPP Occupational Health Program

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Document No.	Document Title
WP 15-PR	WIPP Records Management Program
WP 15-PR.01	WIPP Emergency Operating Records Protection Program Plan
WP 15-PR3006	Records Inventory and Disposition System Schedule Review and Approval
WP 15-RA.01	Price-Anderson Program
DOE/WIPP 91-030	Mitigation Action Plan for the Records of Decision for the Waste Isolation Pilot Plant
DOE/WIPP 93-004	Waste Isolation Pilot Plant Land Management Plan
DOE/CBFO 94-1007	Recovery Guide for TRU Waste Packages
DOE/CAO 94-1051	Federal Employee Occupational Safety and Health Program
DOE/WIPP 97-2238	Periodic Confirmatory Measurement Protocol for the Waste Isolation Pilot Plant
DOE/CBFO 98-2276	Integrated Safety Management System Description
DOE/WIPP 99-2194	Environmental Monitoring Plan
DOE/WIPP 01-2225	1998 Site Environmental Report
DOE/WIPP 99-2286	Reporting Implementation Plan
DOE/WIPP 00-2001	WIPP Facility Work Plan for SWMUs and Areas of Concern
DOE/WIPP 00-3121	Implementation Plan for 40 CFR 191, Subpart A

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Appendix A - Index of Requirements by Technical Subject Areas

CITATION	REQUIREMENT	BECR SECTION
Air Quality Legislation		
CAA, Title I	Air Pollution Prevention and Control	6.1.1
CAA, Title II	Emissions Standards for Moving Sources	6.1.2
CAA, Title III	General	6.1.3
CAA, Title IV	Acid Deposition Control	6.1.4
CAA, Title V	Permits	6.1.5
CAA, Title VI	Stratospheric Ozone Protection	6.1.6
CAA, §112(r)	Prevention of Accidental Releases	6.2.2.8
CAA, §118	Control of Pollution from Federal Facilities	6.2.1
40 CFR §§50.4 Through 50.12	National Ambient Air Quality Standards	6.1.1.1
40 CFR Part 51	National Ambient Air Quality Standards	6.1.1.1
40 CFR §51.166	Prevention of Significant Deterioration Program	6.1.1.3
40 CFR Part 60	New Source Performance Standards	6.1.1.3
40 CFR Part 61	National Emission Standards for Hazardous Air Pollutants (NESHAP)	6.1.1.4
40 CFR Part 61, Subpart H	National Emission Standards of Radionuclides Other than Radon from Department of Energy Facilities	6.1.1.2 and 6.2.2
40 CFR §61.09(a)(1)	NESHAP Prestart-Up Notification	6.2.2.1
40 CFR §61.09(a)(2)	NESHAP Poststart-Up Notification	6.2.2.2
40 CFR §61.93(a),(b)	Emissions Monitoring and Test Procedures	6.2.2.3
40 CFR §61.93(b) and Appendix B, Method 114, Section 4.10	NESHAP Quality Assurance Project Plan	6.2.2.4
40 CFR §61.94	NESHAP Annual Report	6.2.2.5
40 CFR §61.95	Record-keeping Requirements	6.2.2.6
40 CFR §61.96	NESHAP Application for Radionuclides	6.2.2.7
40 CFR Part 68	Chemical Accident Prevention Provisions	6.2.2.8
40 CFR Part 70	State Operating Permit Programs	6.1.5
40 CFR §80.7	Reporting Information for Gasoline Represented as Being Unleaded at the Request of the EPA	6.2.3.1
40 CFR §80.22	Prohibition Against Dispensing Gasoline Containing Lead or Lead Additives	6.2.3.2
40 CFR §80.23	Liability for Violations	6.2.3.3
40 CFR Part 82	Stratospheric Ozone Protection	6.1.6 6.2.4
40 CFR §82.34	Restrictions on Repairing and Servicing Motor Vehicle Air Conditioners	6.2.4.1
40 CFR §82.124(a)(4)	Prohibitions	6.2.4.2
40 CFR §82.150	Service, Maintenance, and Repair of Appliances Using Refrigerants	6.2.4.3
40 CFR §82.154	Prohibitions Regarding Maintenance, Service, Repair, or Disposal of Appliances	6.2.4.4
40 CFR §82.156	Required Practices	6.2.4.5

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
20.2 NMAC	New Mexico Air Quality Control Regulations	28.1
20.2.60 NMAC	Regulations to Control Open Burning	28.2.6
20.2.61 NMAC	Regulations to Control Smoke and Visible Emissions	28.2.7
20.2.18 NMAC	Oil-burning Equipment -- Particulate Matter	28.2.4
20.2.34 NMAC	Oil-burning Equipment -- Nitrogen Dioxide	28.2.5
20.2.70 NMAC	Operating Permits	6.1.5
20.2.70.300 NMAC	Compliance Plan	28.2.8
20.2.70.300 NMAC	Semiannual Operating Permit Reports and Progress Reports on the Compliance Plan	28.2.9
20.2.71 NMAC	Operating Permit Emission Fees	6.1.5
20.2.72 NMAC	Permits	28.2.10
20.2.73 NMAC	Annual Emission Inventory	28.3.1.11.1
20.2.75 NMAC	Permit Fees	28.2.11
20.2.80 NMAC	Stack Height Requirements	28.2.12
20.2.7.108 NMAC	Excess Emissions During Malfunction, Start-Up, Shutdown, or Scheduled Maintenance	28.2.2
20.2.8 NMAC	Controlling Emissions Leaving New Mexico	28.2.3
20.2.1.113 NMAC	Sampling Equipment	28.2.1
Air Quality Permit No. 310-M-2	Permit for Diesel Backup Generators	28.3.1
Condition 1	Construction and Operation	28.3.1.1
Condition 2	Emission Rates	28.3.1.2
Conditions 3-4	Compliance Test Methods	28.3.1.3
Condition 5	Revisions and Modifications	28.3.1.4
Condition 6	Notification to Subsequent Owners	28.3.1.5
Condition 7	Right to Access Property and Review Records	28.3.1.6
Condition 8	Posting of the Permit	28.3.1.7
Condition 9	Record Keeping	28.3.1.8
Condition 10	Reporting	28.3.1.9
Additional Condition, p. 8	Permit Cancellations	28.3.1.10
Additional Condition, p. 8	Notice of Intent and Emission Inventory	28.3.1.11
Environmental Protection Legislation		
§§74-1-1 Through 74-1-10	New Mexico Environmental Improvement Act	24.1
10 CFR Part 1021	National Environmental Policy Act Implementing Procedures	12.3.1
10 CFR Part 1021	Implementing DOE's NEPA Regulations	12.3.2
29 CFR Part 1910	Occupational Safety and Health Standards	11.1
29 CFR §1910.95	Occupational Noise Exposure	11.1
29 CFR §1910.95	Compliance with Hearing Protection Standards	11.2.1
40 CFR Part 141	National Primary Drinking Water Regulations	8.1
40 CFR §142.4(b)	State Program Requirements	8.2.1 and Chapter 30.0
40 CFR Part 144	Underground Injection Control Program	8.1
40 CFR Part 144	Underground Injection Control	8.2.2

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
40 CFR Part 300	National Oil and Hazardous Substances Pollution Contingency Plan	3.1
40 CFR Part 302	Designation, Reportable Quantities, and Notification	3.1
40 CFR §302.4	Designation of Hazardous Substances	3.2.1
40 CFR §302.5	Determination of Reportable Quantities	3.2.2
40 CFR §302.6(a)	Notification Requirements	3.2.3
40 CFR §302.6(b)(1)(i) and (iii)	Releases of Mixture or Solutions	3.2.4
40 CFR §302.6(b)(2)	Notification of Releases of Radionuclides	3.2.5
40 CFR §302.6(d)	Notification of the Release of Heavy Metals	3.2.6
40 CFR Part 355	Emergency Planning and Notification	4.1
40 CFR §355.30(a)	Emergency Planning	4.2.1
40 CFR §355.30(b)	Emergency Planning Notification	4.2.2
40 CFR §355.30(c)	Facility Emergency Coordinator	4.2.3
40 CFR §355.30(d)	Provision of Information	4.2.4
40 CFR §355.40	Emergency Release Notification	4.2.5
40 CFR Part 370	Hazardous Chemical Reporting: Community Right-to-Know	4.1
40 CFR §370.21	Material Safety Data Sheet Reporting	4.2.6
40 CFR §370.25	Inventory Reporting	4.2.7
40 CFR Part 372	Toxic Chemical Release Reporting: Community Right-to-Know	4.1
40 CFR Parts 1500 Through 1508	Provision of Environmental Information to Public Officials and Private Citizens	12.2.1
§§74-4B-1 - 74-4B-14, NMSA 1978	New Mexico Emergency Management Act	32.1
§74-4B-5	State Police Emergency Response Officer; Procedure for Notification; Cooperation with Other State Agencies and Local Governments	32.2.1
§74-4B-10	Clean-Up	32.2.2
Hazardous Substance Legislation		
TSCA, Title II	Asbestos Hazard Emergency Response Act (AHERA)	9.1.1
TSCA, Title III	Indoor Radon Abatement	9.1.2
TSCA §3(e)	Polychlorinated Biphenyls	9.1.3
TSCA §309	Study of Radon in Federal Buildings	9.2.1
40 CFR §152.15	Registration of Pesticide Products	10.2.1
40 CFR §156.10	Storage and Disposal of Pesticides and Containers	10.2.2
40 CFR Part 761	Polychlorinated Biphenyls	9.1.3
40 CFR §761.20	Prohibition of PCBs	9.2.2
40 CFR §761.60	Disposal Requirements	9.1.3 and 9.2.3
40 CFR §761.65	Storage for Disposal	9.1.3
HCIA §74-4E	New Mexico Hazardous Chemicals Information Act (HCIA)	31.1
HCIA §74-4E-5(A)(1)	Notice of Extremely Hazardous Substance	31.2.1
HCIA §74-4E-5(A)(2)	Notice of Release of Chemical Substance(s)	31.2.2

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
HCIA §74-4E-5(A)(3)	Hazardous Material Inventory	31.2.3
HCIA §74-4E-5(A)(4)	Toxic Chemical Release Inventory	31.2.4
Regulatory Order No. 4	New Mexico Pesticide Control Act: Regulatory Order of the Board of Regents of New Mexico State University	37.1
Section 5	Storage of pesticides and disposal of pesticide wastes	37.2.1
Regulatory Order No. 5	New Mexico Pesticide Control Act: Definitions, Licensing, Equipment Inspections, Record Keeping of Pesticides by Regulated Applicators	37.1
Section 6	License Classifications	37.2.2
Section 10	Protective Equipment	37.2.3
Section 11	Application of Pesticides	37.2.4
Historic Preservation Legislation		
36 CFR Part 800	Protection of Historic and Cultural Properties	23.1
36 CFR §800.5	Assessment of Effects on Historic Properties	23.2.1
36 CFR §800.11	Development Plan for the Treatment of Historical Property Discovered During a Federal Agency Undertaking	23.2.2
43 CFR §7.5	Application for Permits and Information Collection	23.2.3
§§18-8-1 Through 18-8-8	New Mexico Prehistoric and Historic Sites Preservation Act	33.1
Land Management Legislation		
43 CFR Part 3600	Mineral Materials Disposal: General	16.1
43 CFR Part 1600	Planning, Programming, Budgeting	17.1
43 CFR §1610.1	Resource Management Planning Guidance	17.2.1
43 CFR §1610.2	Public Participation	17.2.2
43 CFR §1610.3-2	Consistency of Management Plans	17.2.3
43 CFR Part 2800	Rights-of-Way, Principles and Procedures	17.1
43 CFR §2801.2(a)	Common Terms and Conditions of Right-of-Way Reservations and Temporary-Use Permits	17.2.4
43 CFR §2801.2(b)	Conditions to Be Incorporated Within All Right-of-Way Reservations and Temporary-Use Permits	17.2.5
43 CFR §2802.2	Requirements for Applications for Right-of-Way Reservations and Temporary-Use Permits	17.2.6
CC 1	Common Conditions (CC) of the Right-of-Way Reservations	17.3.1
FLPMA, Title II	Land Use Planning; Land Acquisition and Disposition	17.1
FLPMA, Title V	Rights-of-Way	17.1
Sec. 13; Standard Stipulations	Right-of-Way Reservation No. NM 53809, Water Pipeline	17.3.2
Sec. 13; Standard Stipulations 1, 2, 5, 6, 8	Preconstruction and Construction Conditions for the Water Pipeline	17.3.2.1
Sec. 13E	Livestock Water	17.3.2.2
Standard Stipulation 3	Road Construction	17.3.2.3
Standard Stipulation 7	Gates or Cattle Guards on Public Lands	17.3.2.4

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
Sec. 13; Standard Stipulations	Right-of-Way Reservation No. NM 55676, North Access Road	17.3.3
Standard Stipulation 2	Polychlorinated Biphenyls	17.3.3.1
Standard Stipulations 3 Through 5	Standard Stipulations for the Construction of Overhead Electric Distribution Lines	17.3.3.2
Standard Stipulation 6	Posting of BLM Serial Number	17.3.3.3
Terms/Conditions 7 and 8	Actions Required upon Abandonment, Relinquishment, or Expiration of Right-of-Way Reservation	17.3.3.4
Amendment (April 22, 1988)	Fencing	17.3.3.5
Sec. 13; Standard Stipulations	Right-of-Way Reservation No. NM 55699, Railroad	17.3.4
Standard Stipulations 1 Through 4, 7 Through 9, 11	Preconstruction and Construction Requirements for the Railroad Spur	17.3.4.1
Standard Stipulation 5	Reseeding upon Completion of Construction	17.3.4.2
Standard Stipulation 6	Abandonment of the Site	17.3.4.3
Standard Stipulation 10	Access to Water for Livestock	17.3.4.4
Standard Stipulation 12	Removal of Caliche and/or Other Mineral Material	17.3.4.5
Standard Stipulation 13	Application for Free-Use Permits	17.3.4.6
Amendment	Notification of BLM Regarding the Access Road Parallel to the Railroad	17.3.4.7
Sec. 13; Standard Stipulations	Right-of-Way Reservation No. NM 77921, Aerosol Sampling Site	17.3.5
#1	Construction, Operation, and Maintenance	17.3.5.1
#3	Security and Operation of Aerosol Sampling Station	17.3.5.2
#5	Rehabilitation of the Land Occupied by the Aerosol Sampling Station	17.3.5.3
	Use of the Abandoned Concrete Slab	17.3.5.4
Sec. 13; Standard Stipulations	Caliche Free-Use Permit No. NM-96943	17.3.6
	Reclamation of Caliche Borrow Pit	17.3.6.1
43 CFR Part 4100	Grazing Administration - Exclusive of Alaska	18.1 and 19.1
43 CFR §§4100.0 Through 4100.8	Land-use Plans	18.2.1 and 19.2.1
43 CFR §4120.2	Allotment Management Plans	19.2.2
19.2.10 NMAC	Relating to Easements and Rights-of-Way	34.1
19.2.10.12 NMAC	Survey Plat	34.2.1
19.2.10.13 NMAC	Application Form	34.2.2
19.2.10.16 NMAC	Easement of Right-of-Way Dimensions	34.2.3
19.2.10.18 NMAC	Damage Surety	34.2.4
19.2.10.20 NMAC	Affidavit of Completion	34.2.6
19.2.10.24 NMAC	Renewal of Right-of-Way Reservations	34.2.7
19.2.10.27 NMAC	Reclamation and Restoration	34.2.8
RW 22789	Permit No. RW-22789 for a High-Volume Air Sampler	34.3
Term/Condition #3	Disposal of Brush and Other Debris	34.3.1

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
Term/Condition #5	Prevention of Destruction or Injury to Improvements or Livestock	34.3.2
Term/Condition #6	Purpose of Right-of-Way	34.3.3
Term/Condition #7	Existing Rights	34.3.4
Term/Condition #8	Leases for Mineral Resources	34.3.5
Term/Condition #9	Compliance with All Applicable Regulations and Requirements	34.3.6
Term/Condition #10	Non-Use of the Right-of-Way	34.3.7
Term/Condition #13	Protection and Preservation of Natural Environmental Conditions	34.3.8
Term/Condition #14	Reclamation of All Disturbed Areas	34.3.9
10 CFR Part 830	Nuclear Safety Management	13.3
10 CFR §830.4(a)	Taking Action(s) Inconsistent with the Requirements of 10 CFR Part 830	13.3.1
10 CFR §830.4(b)	Implementation and Compliance with the Requirements of 10 CFR Part 830	13.3.2
10 CFR §830.4(c)	Reasonable Assurance of Adequate Protection of Workers, the Public, and the Environment	13.3.3
10 CFR §830.6	Records to Substantiate Compliance	13.3.4
10 CFR §830.7	Use of a Graded Approach	13.3.5
10 CFR §830.121(a) and 10 CFR §830.122	Conduct of Work	13.3.6
10 CFR §830.120(b) and (c)	Application of the Appropriate QA Criteria in the QAP and Annual Submittal of Substantive Changes in the QAP to the DOE	13.3.7
10 CFR §830.122	QA Criteria to be Included in the QAP	13.3.8
10 CFR §830.202(a)	Safety Basis	13.3.9
10 CFR §830.203(a)	Unreviewed Safety Question Process	13.3.10
10 CFR §830.204(a)	Documented Safety Analysis	13.3.11
10 CFR §830.205(a)	Technical Safety Requirements	13.3.12
10 CFR Part 834	Radiation Protection of the Public and the Environment	13.3
10 CFR Part 835	Occupational Radiation Protection	13.3
10 CFR §835.202(a)	Occupational Dose Limits for General Employees	13.3.13
40 CFR Part 191	Radiation Protection Standards	5.2.1
40 CFR Part 194	WIPP Compliance Certification	5.2.2
40 CFR §191.03(b)	Standards	5.2.1.1
40 CFR §191.13	Containment Requirements	5.2.1.2
40 CFR §191.15	Individual Protection Requirements	5.2.1.3
40 CFR §191.24	Groundwater Protection Standards	5.2.1.4
Plant and Animal Preservation Legislation		
50 CFR Part 13	General Permit Procedures	20.1, 21.1, and 22.1
50 CFR §13.11	Permit Application Procedures	20.2.1 and 21.2.1
50 CFR §13.12	Information Requirements for Permit Applications	21.2.2

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
50 CFR §13.44	Display of Permit	21.2.3
50 CFR §13.45	Filing of Reports	21.2.4
50 CFR §13.46	Maintenance of Records	21.2.5
50 CFR §13.47	Inspection Requirement	21.2.6
50 CFR §13.48	Compliance with Permit Conditions	21.2.7
50 CFR §13.50	Acceptance of Liability	21.2.8
50 CFR Part 17	Endangered and Threatened Wildlife and Plants	20.1, 21.1, and 22.1
50 CFR §20, Subpart C	Compliance with Applicable Migratory Bird Hunting Regulations	21.2.9
50 CFR Part 21	Migratory Bird Permits	20.1, 21.1, and 22.1
50 CFR §21.22(a)	Application for Banding or Marking Permit	21.2.10
50 CFR §21.22(c)	Additional Permit Conditions	21.2.11
50 CFR §21.22(d)	Term of Permit	21.2.12
50 CFR §21.27	Special-Purpose Permits	21.2.13
50 CFR Part 22	Eagle Permits	20.1, 21.1, and 22.1
50 CFR §22.11	General Permit Requirements	20.2.2
50 CFR §22.25	Permits to Take Golden Eagle Nests	20.2.3
50 CFR Part 402	Interagency Cooperation - Endangered Species Act, as Amended	22.1
§§17-2-37 Through 17-2-46	New Mexico Wildlife Conservation Act	35.1 and 36.1
19.33.2 NMAC	Report of Unpermitted Removal, Capture, or Destruction of Endangered Species	36.2.1
19.33.6 NMAC	Recognition of State-Listed Endangered Wildlife	36.2.2
19.36.2 NMAC	Permit Application and Requirements to Conduct Activities	36.2.3
19.36.2 NMAC	Year-End Reports	36.2.4
NMDG&F permits	New Mexico Department of Game and Fish Permits	36.3
Permit No. 1894	Live Trapping; Catfish, and Unprotected Species; Nonlethal Methods for Catfish; Report for Salvaging Endangered or Threatened Vertebrates	36.3.1
Permit No. 1961	Authorization for Live Capture and Banding of Protected Birds, Reporting of Salvaged Endangered or Threatened Wildlife, and Disposition of Wildlife	36.3.2
Waste Management Legislation		
RCRA §3016	Inventory of Federal Hazardous Waste Facilities	2.2.1.1
40 CFR 262 (20.4.1.300 NMAC)	Compliance with Standards Applicable to Generators of Hazardous Waste	25.2.1
40 CFR §262.11	Hazardous Waste Determination	25.2.1.1
40 CFR §262.12	EPA Identification Number	25.2.1.2
40 CFR §262.20	Manifest Requirements	25.2.1.3
40 CFR §262.21	Acquisition of Manifests	25.2.1.4
40 CFR §262.22	Number of Copies	25.2.1.5

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
40 CFR §262.23	Use of the Manifest	25.2.1.6
40 CFR §262.30	Packaging Requirements	25.2.1.7
40 CFR §262.31	Labeling Requirements	25.2.1.8
40 CFR §262.32	Marking Requirements	25.2.1.9
40 CFR §262.33	Placarding Requirements	25.2.1.10
40 CFR §262.34(a)	Accumulation Time	25.2.1.11
40 CFR §262.34(a)(1)(i)	Compliance with Subpart I of 40 CFR Part 264	25.2.1.12
40 CFR §262.34(a)(1)(ii)	Accumulation of Hazardous Wastes	25.2.1.13
40 CFR §262.34(a)(1)(iii)	Compliance with Subpart W of 40 CFR Part 264	25.2.1.14
40 CFR §262.34(a)(2)	Marking with the Date of Initial Accumulation	25.2.1.15
40 CFR §262.34(a)(3)	Marking as Hazardous Waste	25.2.1.16
40 CFR §262.34(a)(4)	Compliance with Emergency Response, Training, and Waste Analysis Plan Requirements	25.2.1.17
40 CFR §262.34(b)	Extension of Storage Period	25.2.1.18
40 CFR §262.34(c)(1)	Restrictions and Requirements	25.2.1.19
40 CFR §262.34(c)(1)(i)	Compliance with 40 CFR §§265.171, 265.172, and 265.173(a)	25.2.1.20
40 CFR §262.34(c)(1)(ii)	Labeling of Container as "Hazardous Waste"	25.2.1.21
40 CFR §262.34(c)(2)	Management of Waste	25.2.1.22
40 CFR §262.40	Record-keeping Requirements	25.2.1.23
40 CFR §262.41	Generator-Biennial Report	25.2.1.24
40 CFR §262.42	Exception Reporting	25.2.1.25
40 CFR §262.43	Additional Reporting	25.2.1.26
40 CFR §262.43	Special Requirements for Generators of Between 100 and 1,000 Kilograms per Month	25.2.1.27
40 CFR §265.1087(c)	Container Level 1 Standards	25.2.1.28
40 CFR Part 263 (20.4.1.400 NMAC)	Compliance with Standards Applicable to Transporters of Hazardous Waste	25.2.2
40 CFR §263.10(a)	Compliance with DOT Regulations	25.2.2.1
40 CFR §263.11	EPA Identification Number	25.2.2.2
40 CFR §263.20 - 263.22	Compliance with the Manifest System and with Record-Keeping Requirements	25.2.2.3
40 CFR §263.30	Immediate Action after Hazardous Waste Discharges	25.2.2.4
40 CFR §263.31	Discharge Cleanup	25.2.2.5
40 CFR Part 264 (20.4.1.500 NMAC)	Compliance with the Regulatory Requirements for TSDFs.	25.2.3
40 CFR §264.10	Applicability	25.2.3.1
40 CFR §264.11	EPA Identification Number	25.2.3.2
40 CFR §264.12(b)	Required Notices	25.2.3.3
40 CFR §264.13	General Waste Analysis	25.2.3.4
40 CFR §264.14	Security	25.2.3.5
40 CFR §264.15	General Inspection Requirements	25.2.3.6
40 CFR §264.16	Personnel Training	25.2.3.7
40 CFR §264.17	General Requirements for Ignitable, Reactive, or Incompatible Wastes	25.2.3.8

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
40 CFR §264.18	Location Standards	25.2.3.9
40 CFR §264.31	Maintenance and Operation of Facility	25.2.3.10
40 CFR §264.32	Required Equipment	25.2.3.11
40 CFR §264.33	Testing and Maintenance of Equipment	25.2.3.12
40 CFR §264.34	Access to Communications or Alarm System	25.2.3.13
40 CFR §264.35	Required Aisle Space	25.2.3.14
40 CFR §264.37	Arrangements with Local Authorities	25.2.3.15
40 CFR §264.51	Purpose and Implementation of the Contingency Plan	25.2.3.16
40 CFR §264.52	Content of the Contingency Plan	25.2.3.17
40 CFR §264.53	Copies of Contingency Plan	25.2.3.18
40 CFR §264.54	Amendment of Contingency Plan	25.2.3.19
40 CFR §264.55	Emergency Coordinator	25.2.3.20
40 CFR §264.56	Emergency Procedures	25.2.3.21
40 CFR §264.71	Use of Manifest System	25.2.3.22
40 CFR §264.72	Manifest Discrepancies	25.2.3.23
40 CFR §264.73	Operating Record	25.2.3.24
40 CFR §264.74	Availability, Retention, and Disposition of Records	25.2.3.25
40 CFR §264.75	TSDF Biennial Report	25.2.3.26
40 CFR §264.76	Unmanifested Waste Report	25.2.3.27
40 CFR §264.77	Additional Reports	25.2.3.28
40 CFR §264.90	Applicability of the Groundwater Monitoring System	25.2.3.29
40 CFR §264.91	Required Programs	25.2.3.30
40 CFR §264.92	Groundwater Protection Standard	25.2.3.31
40 CFR §264.93	Hazardous Constituents	25.2.3.32
40 CFR §264.94	Concentration Limits	25.2.3.33
40 CFR §264.95	Point of Compliance	25.2.3.34
40 CFR §264.97	General Groundwater Monitoring Requirements	25.2.3.35
40 CFR §264.98	Detection Monitoring Program	25.2.3.36
40 CFR §264.101	Corrective Action for Solid Waste Management Units	25.2.3.37
40 CFR §264.110	Applicability of the Closure/Post-Closure Requirements	25.2.3.38
40 CFR §264.111	Closure Performance Standard	25.2.3.39
40 CFR §264.112	Closure Plan; Amendment of Plan	25.2.3.40
40 CFR §264.113	Time Allowed for Closure	25.2.3.41
40 CFR §264.114	Disposal or Decontamination of Equipment, Structures, and Soils	25.2.3.42
40 CFR §264.115	Certification of Closure	25.2.3.43
40 CFR §264.116	Survey Plat	25.2.3.44
40 CFR §264.117	Postclosure Care and Use of Property	25.2.3.45
40 CFR §264.118	Postclosure Plan; Amendment of Plan	25.2.3.46
40 CFR §264.119	Postclosure Notices	25.2.3.47
40 CFR §264.120	Certification of Completion of Post-Closure Care	25.2.3.48
40 CFR Subpart I; 40 CFR Parts 171 Through 179	Condition of Containers	25.2.3.49

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
40 CFR Subpart X; 40 CFR Parts 601 Through 603	Miscellaneous Units	25.2.3.50
40 CFR Part 268	Land Disposal Restrictions	2.2.2
40 CFR Part 270 (20.4.1.900 NMAC and 20.4.1.901 NMAC)	Compliance with the Hazardous/Mixed Waste Permit Program	25.2.4
40 CFR §270.1	Purpose and Scope of the Hazardous Waste Facility Permit Program Regulations	25.2.4.1
40 CFR §270.11	Signatories to Permit Applications and Reports	25.2.4.2
40 CFR §270.30	Conditions Applicable to All Permits	25.2.4.3
40 CFR §270.31	Requirements for Recording and Reporting of Monitoring Results	25.2.4.4
40 CFR §270.42	Permit Modification at the Request of the Permittee	25.2.4.5
20.9.1 NMAC	Solid Waste Management Regulations	26.1
20.9.1.106 NMAC	General Requirements	26.2.1
20.9.1.107 NMAC	Prohibited Acts	26.2.2
20.9.1.108.C NMAC	Exemptions	26.2.3
20.9.1.109 NMAC	Record Keeping and Annual Reports	26.2.4
20.9.1.111 NMAC	Entry by Department; Availability of Records	26.2.5
20.9.1.200 NMAC	Solid Waste Facility Permits	26.2.6
20.9.1.200.N NMAC	Registration of Commercial Haulers	26.2.7
20.9.1.400 NMAC	Solid Waste Facility Operation Requirements	26.2.8
20.9.1.500 NMAC	Landfill Closure and Postclosure Requirements	26.2.9
20.9.1.600 NMAC	Operator Certification	26.2.10
20.9.1.700.E NMAC	Asbestos Waste	26.2.11
20.9.1.700.F NMAC	Storage and Containment of Infectious Waste	26.2.12
20.9.1.700.F(4) NMAC	Infectious Waste Treatment, Storage, and Disposal Facilities	26.2.13
20.9.1.700.F(5) NMAC	Treatment and Disposal of Infectious Waste	26.2.14
20.9.1.700.H NMAC	Petroleum Contaminated Soil	26.2.16
20.9.1.712 NMAC	Manifest Requirements	26.2.15
Underground Storage Tanks		
20.5 NMAC	New Mexico Underground Storage Tank Regulations	25.2.6
20.5.1.2 NMAC	Scope	25.2.6.1
20.5.2.200 NMAC	Existing Tanks	25.2.6.2
20.5.2.201 NMAC	Transfer of Ownership	25.2.6.3
20.5.2.202 NMAC	New UST System	25.2.6.4
20.5.2.203 NMAC	Substantially Modified UST Systems	25.2.6.5
20.5.2.204 NMAC	Notification of Spill or Release	25.2.6.6
20.5.2.205 NMAC	Emergency Repairs and Tank Replacement	25.2.6.7
20.5.2.206 NMAC	Application Forms	25.2.6.8
20.5.2.207 NMAC	Registration Certificate	25.2.6.9
20.5.3.300 NMAC	Payment of Fee	25.2.6.10
20.5.3.301 NMAC	Amount of Fee	25.2.6.11

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
20.5.3.302 NMAC	Late Payment Penalties	25.2.6.12
20.5.4.400 NMAC	Performance Standards for Tanks in New UST Systems	25.2.6.13
20.5.4.400.B NMAC	Design and Construction of Piping	25.2.6.14
20.5.4.400.C(1)(a) NMAC	Spill Prevention Equipment	25.2.6.15
20.5.4.400.C(1)(b) NMAC	Overflow Prevention Equipment	25.2.6.16
20.5.4.400.D NMAC	Installation of Tanks and Piping	25.2.6.17
20.5.4.400.E NMAC	Certificate of Installation	25.2.6.18
20.5.4.402 NMAC	Certificate of Compliance and Notification Requirements	25.2.6.19
20.5.5.500.A NMAC	Spill and Overflow Control	25.2.6.20
20.5.5.502 NMAC	Compatibility	25.2.6.21
20.5.5.503.A NMAC	Repairs Allowed	25.2.6.22
20.5.5.503.B NMAC	Repairs to Fiberglass-Reinforced Plastic Tanks	25.2.6.23
20.5.5.503.C NMAC	Repairs of Pipe Sections and Fittings	25.2.6.24
20.5.5.503.D NMAC	Tightness Testing after Repairs	25.2.6.25
20.5.5.503.F NMAC	Records of All Repairs	25.2.6.26
20.5.5.504.A NMAC	Reporting	25.2.6.27
20.5.5.504.B NMAC	Record-keeping Requirements	25.2.6.28
20.5.5.504.C NMAC	Availability and Maintenance of Records	25.2.6.29
20.5.5.505.A NMAC	Inspections, Monitoring, and Testing of USTs	25.2.6.30
20.5.5.505.C NMAC	Inspections of UST Installations, Repairs or Modifications, or Removals or System Closures	25.2.6.31
20.5.6.600.A NMAC	General Requirements for All UST Systems	25.2.6.32
20.5.6.600.B NMAC	Notification of Releases	25.2.6.33
20.5.6.600.C NMAC	Schedule for Required Release Detection	25.2.6.34
20.5.6.601.A NMAC	Requirements for Tanks of Petroleum UST Systems	25.2.6.35
20.5.6.601.B NMAC	Requirements for Piping of Petroleum UST Systems	25.2.6.36
20.5.6.601.B(1) NMAC	Requirements for Pressurized Piping	25.2.6.37
20.5.6.601.B(2) NMAC	Requirements for Suction Piping	25.2.6.38
20.5.6.602 NMAC	Requirements for Hazardous Substance UST Systems	25.2.6.39
20.5.6.603 NMAC	Methods of Release Detection for Tanks	25.2.6.40
20.5.6.603.A NMAC	Inventory Control	25.2.6.41
20.5.6.603.G NMAC	Interstitial Monitoring	25.2.6.42
20.5.6.603.H NMAC	Other Methods of Detecting Releases	25.2.6.43
20.5.6.604 NMAC	Methods of Release Detection of Piping	25.2.6.44
20.5.6.605 NMAC	Release Detection Record Keeping	25.2.6.45
20.5.7.701 NMAC	Suspected Releases	25.2.6.46
20.5.7.702 NMAC	Investigations Due to Off-Site Impacts	25.2.6.47
20.5.7.703 NMAC	Confirmation Steps	25.2.6.48
20.5.7.704.A NMAC	Reporting and Cleanup of Large Spills and Overfills	25.2.6.49
20.5.7.704.B NMAC	Reporting and Cleanup of Small Spills and Overfills	25.2.6.50
20.5.8.800 NMAC	Temporary Closure	25.2.6.51
20.5.8.802.B NMAC	Corrective Action	25.2.6.52
20.5.9.900 NMAC	Applicability of Financial Responsibility	25.2.6.53

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
20.5.12.1200.A NMAC	Cleanup Requirements for Releases from Petroleum UST Systems	25.2.6.54
Universal Waste Legislation		
40 CFR Part 273 (20.4.1.1000 NMAC)	Universal Waste Regulations	25.1 and 25.2.5
40 CFR §273, Subpart B	Standards for Universal Waste, Small-Quantity Handlers	25.2.5.1
40 CFR §273.11	Prohibitions	25.2.5.2
40 CFR §273.13	Waste Management	25.2.5.3
40 CFR §273.14	Labeling/Marking	25.2.5.4
40 CFR §273.15	Accumulation Time Limits	25.2.5.5
40 CFR §273.16	Employee Training	25.2.5.6
40 CFR §273.17	Responses to Releases	25.2.5.7
40 CFR §273.18	Off-Site Shipments	25.2.5.8
Waste Transportation Legislation		
49 CFR Part 171	General Information, Regulations, and Definitions	15.1
49 CFR §171.2	General Requirements	15.2.1
49 CFR §171.3	Hazardous Waste	15.2.2
49 CFR §171.14	Transitional Provisions for Implementing Requirements	15.2.3
49 CFR §§171.15 and 171.16	Immediate Notice of Certain Hazardous Materials Incidents and Detailed Hazardous Materials Incident Reports	15.2.4
49 CFR Part 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communication Requirements and Emergency Response Information Requirements	15.1
49 CFR §172.101	Table of Hazardous Materials and Special Provisions	15.2.5
49 CFR §§172.200 Through 172.205, Subpart C	Shipping Papers	15.2.6
49 CFR §§172.300 Through 172.338, Subpart D	Marking	15.2.7
49 CFR §§172.400 Through 172.450, Subpart E	Labeling	15.2.8
49 CFR §§172.500 Through 172.560, Subpart F	Placarding	15.2.9
49 CFR §172.600, Subpart G	Emergency Response Information	15.2.10
49 CFR §§172.700 Through 172.704, Subpart H	Training Requirements, Federal/State Relationship, and Applicability and Responsibility for Training, and Testing and Training Requirements	15.2.11
49 CFR Part 173	Shippers - General Requirements for Shipments and Packagings	15.1
49 CFR §§173.1 Through 173.12, Subpart A	General	15.2.12
49 CFR §§173.21 Through 173.40, Subpart B	Preparation of Hazardous Materials for Transportation	15.2.13
49 CFR §§173.50 Through 173.63, Subpart C	Definitions, Classification, and Packaging for Class 1 Materials	15.2.14

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
49 CFR §§173.115 Through 173.156, Subpart D	Definitions, Classification, Packaging Group Assignments, and Exceptions for Hazardous Materials Other than Class 1 and Class 7	15.2.15
49 CFR §§173.158 Through 173.229, Subpart E	Non-Bulk Packaging Requirements for Hazardous Materials Other than Class 1 and Class 7	15.2.16
49 CFR §§173.401 Through 173.476, Subpart I	Radioactive materials	15.2.17
49 CFR Part 175	Carriage by Aircraft	15.1 and 15.2.18
49 CFR Part 177	Carriage by Public Highway	15.1
49 CFR §§177.800, 177.816, and Part 397, Subpart D	General Information and Regulations, Driver Training, and Routing of Class 7 (Radioactive) Materials	15.2.19
49 CFR Part 178	Specifications for Packagings	15.1 and 15.2.20
Water Quality Legislation		
40 CFR Part 112	Oil Pollution Prevention	7.1
40 CFR §112.3	SPCC Plan Requirements	7.2.1
40 CFR §112.5	Amendment of SPCC Plan by the Owner/Operator	7.2.2
40 CFR §117.21	Notification of Discharge of RQ	7.2.3
40 CFR Part 122	EPA-Administered Permit Programs: the National Pollutant Discharge Elimination System (NPDES)	7.1
40 CFR §122.1(b)(1)	NPDES Permit Requirement	7.2.4
40 CFR §122.21(c)	NPDES Permit Assessment for Sewage Sludge	7.1
40 CFR §122.21(c)(2)	NPDES Permit Assessment	7.2.5
40 CFR §122.26(a)	Requirement for a NPDES Permit for Storm Water Discharges	7.2.6
IV(A)(4)	Notice of Termination	7.3.1
IV(B)(1); Appendix B, III(A)	Prohibition on Non-Storm Water Discharges	7.3.2
IV(B)(2); Appendix B, III(B)	Releases of Reportable Quantities of Hazardous Substances and Oil	7.3.3
NMED 92-1	New Mexico Environment Department 92-1, Ground Water Protection Act Corrective Action Fund Regulations	27.1
NMED 92-1	Corrective Actions for Spills/Releases from USTs	27.3
DP-831 Condition for Approval #1	Requirement for Reporting Discharge Volumes, Water Sources, and Quarterly Reports	29.3.1
DP-831 CA #2	Requirement for Water Quality Analysis Submitted with Quarterly Report	29.3.2
DP-831 CA #3	Requirement for Reporting Volume and Origin of Miscellaneous Nonhazardous Discharges	29.3.3
DP-831 Specific Requirement 1	Authorization to Discharge	29.3.4
DP-831 Specific Requirement 2	Authorization to Discharge	29.3.5
DP-831 Specific Requirement 3	Authorization to Discharge	29.3.6
DP-831 Specific Requirement 4	Maintenance of Berms	29.3.7
DP-831 Specific Requirement 5	Contingency Plan Required	29.3.8
DP-831 Specific Requirement 6	Facility Closure Plan Required	29.3.9

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CITATION	REQUIREMENT	BECR SECTION
DP-831 General Requirement	Monitoring and Reporting	29.3.10
DP-831 General Requirement	Record Keeping	29.3.11
DP-831 General Requirement	Inspection and Entry	29.3.12
DP-831 General Requirement	Duty to Provide Information	29.3.13
DP-831 General Requirement	Spills, Leaks, and Unauthorized Discharges	29.3.14
DP-831 General Requirement	Retention of Records	29.3.15
DP-831 General Requirement	Modifications And/or Amendments	29.3.16
20.6.2 NMAC	New Mexico Water Quality Control Commission Regulations	29.1
20.6.4 NMAC	Water Quality Standards for Interstate and Intrastate Streams in New Mexico	29.2.10
20.6.2.1201 NMAC	Notice of Intent to Discharge	29.2.1
20.6.2.1202 NMAC	Filing of Plans and Specifications -- Sewerage Systems	29.2.2
20.6.2.1203 NMAC	Notification of Discharge - Removal	29.2.3
20.6.2.2101 NMAC	General Requirements	29.2.4
20.6.2.3104 NMAC	Discharge Permit Required	29.2.5
20.6.2.3106 NMAC	Application for Discharge Permits and Renewals	29.2.6
20.6.2.3107 NMAC	Monitoring, Reporting, and Other Requirements	29.2.7
20.6.2.3108 NMAC	Public Notice and Participation	29.2.8
20.6.2.3109 NMAC	Director Approval, Disapproval, Modification, or Termination of Proposed Discharge Plans	29.2.9
	New Mexico Water Supply Regulations (WSR)	30.1
20.7.10.200.E NMAC	Maximum Microbiological Contaminant Level	30.2.1
20.7.10.200.H(9) NMAC	Cross Connections	30.2.2
20.7.10.300.A(5) NMAC	Sampling Certificates	30.2.3
20.7.10.300.B NMAC	Compliance Sampling	30.2.4
20.7.10.300.I NMAC	Laboratories	30.2.5
20.7.10.300.J NMAC	Sampling of Consecutive Public Water-supply Systems	30.2.6
20.7.0.400.A NMAC	Reporting Requirements	30.2.7
20.7.10.400.C NMAC	Record Maintenance	30.2.8
20.7.4 NMAC	Utility Operator Certification	29.2.11

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

**Appendix B - Title 40 CFR Part 191, Subpart A, Environmental Standards for
Management and Storage**

2001 WIPP Periodic Confirmatory Measurement Compliance Report

2001 Report Summary

2001 CAP88-PC Output Data for the Maximum Exposed Individual at the DOE
Exclusive Use Area

2001 CAP88-PC Output Data for the Maximum Exposed Individual beyond the WIPP
Land Withdrawal Boundary

2000 WIPP Periodic Confirmatory Measurement Compliance Report

2000 Report Summary

2000 CAP88-PC Output Data for the Maximum Exposed Individual at the DOE
Exclusive Use Area

2000 CAP88-PC Output Data for the Maximum Exposed Individual beyond the WIPP
Land Withdrawal Boundary

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CY 2001 REPORT SUMMARY

This report satisfies the reporting requirements established by 40 CFR Part 191, Subpart A, "Environmental Management and Storage." The Clean Air Act Assessment Package-1988 (CAP88-PC) dose assessment computer model was used to estimate the dose(s) reported in this report. Copies of the output data from CAP88-PC are attached.

Year of Reporting Period: 2001

Compliance:

Calculations made using the above-referenced code indicate that the effective dose equivalent (EDE) to the maximally exposed individual resulting from normal operations conducted at this facility is less than 9.70E-05 millirem (mrem) per year whole-body and 1.69E-03 mrem per year to the critical organ. These values are in compliance with the requirements of 40 CFR Part 191, Subpart A of 25 mrem whole-body and 75 mrem to any critical organ.

SUMMARY OF SOURCE TERM AND CALCULATED EFFECTIVE DOSE EQUIVALENTS

Table 1. Summary of Radionuclide Effluents from Underground Storage Areas and Waste Handling Building

Station	Radionuclide	Calculated Activity Released (Ci/Yr)	Particle Size (um)*	Class (D, W, Y)+
A	²³⁸ Pu	4.62x10 ⁻⁸	1	W
A	^{239/240} Pu	4.65x10 ⁻⁸	1	W
A	²⁴¹ Am	7.66x10 ⁻⁸	1	W
B	²³⁸ Pu	2.72x10 ⁻⁹	1	W
B	^{239/240} Pu	9.35x10 ⁻¹⁰	1	W
B	²⁴¹ Am	3.71x10 ⁻⁹	1	W
C	²³⁸ Pu	7.24x10 ⁻⁹	1	W
C	^{239/240} Pu	2.36x10 ⁻⁹	1	W
C	²⁴¹ Am	9.94x10 ⁻⁹	1	W

* Default values from CAP88-PC

+ Assumed to yield upper bound dose estimates

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

FACILITY NAME AND LOCATION

Facility: Waste Isolation Pilot Plant (WIPP)
Facility Location: 26 Miles SE of Carlsbad, New Mexico 88221

RADIOACTIVE MATERIALS USED

The waste managed at WIPP contains transuranic (TRU) radionuclides. The TRU radionuclides with the highest potential to deliver a dose to an off-site receptor are ^{238}Pu , ^{239}Pu , ^{240}Pu , and ^{241}Am . Operations at the WIPP facility do not involve handling any loose radioactive material. All waste containers are sealed at the waste-generating facilities and remain sealed during the disposal operation. Removable contamination on the exterior surfaces of containers is restricted to minimal levels in accordance with DOE/WIPP-069, Waste Acceptance Criteria for the Waste Isolation Pilot Plant, and should not present a significant source of radionuclide release in airborne effluents. During normal operating conditions, there is essentially no potential for airborne emissions of radionuclides contained in the TRU waste managed at the WIPP facility.

Small quantities (i.e., activities) of radioactive materials (mostly sealed sources) are used at the WIPP facility to calibrate and verify the operation of various radiation detection instrumentation. However, this source of radioactive materials does not have the potential to result in measurable off-site dose consequences.

DESCRIPTION OF OPERATIONS

The WIPP facility is a TRU radioactive waste disposal facility owned by the U.S. Department of Energy (DOE) and operated by Westinghouse TRU Solutions LLC. The principal operation of the WIPP facility involves the receipt of contact and planned receipt of remote handled TRU and TRU mixed waste and emplacement in the underground repository for disposal. Only waste that conforms with DOE/WIPP-069, Waste Acceptance Criteria for the Waste Isolation Pilot Plant, is accepted for placement in the WIPP facility. Administrative controls prohibit the waste containers from being opened once they are accepted at WIPP.

EMISSION POINTS

The WIPP facility has three emission points, Stations A, B, and C, that may release airborne radionuclides to the environment. Station A exhausts unfiltered air from the underground repository to the atmosphere. Station B exhausts high-efficiency particulate air (HEPA) filtered air from the underground repository to the atmosphere when in Filtration Mode of operation. When in Filtration Mode, Stations A and B are mutually exclusive (i.e., when air is exhausted from one Station, none is exhausted from the other Station). Stations A and B sample the same air when operated in the Maintenance Bypass, Reduced, or Minimum Mode. Station C exhausts HEPA filtered air from the Waste Handling Building (WHB) to the atmosphere.

EFFLUENT CONTROLS

Radionuclide emissions from waste containers are controlled by filter vents that must be fitted to all waste containers accepted at the WIPP facility. Each filter must exhibit filtering efficiencies of greater than 99.97 percent with 0.3 micron particles of dioctyl phthalate (DOP) smoke (DOE-STD-3020-97).

Air monitors are maintained at strategic locations in the WHB and in the underground repository to monitor the real-time levels of airborne radioactivity. Readouts from the underground air monitors are displayed in the Central Monitoring Room, a continuously occupied location from which WIPP facility operations are monitored. During normal conditions, the underground repository effluent does not pass through HEPA filtration units before being discharged to the environment through Station A. The WHB effluent, generated by aboveground waste handling operations, is subject to continuous HEPA filtration before being discharged to the environment through Station C. Approved and controlled preventive maintenance procedures are used at the WIPP facility to ensure that Stations B and C HEPA filtration units are DOP tested annually and exhibit filtering efficiencies greater than 99.97 percent.

The WHB ventilation system maintains a negative pressure differential between the outside environment and the waste handling environment. This differential provides a secondary confinement barrier against the release of radionuclides to the environment, where the waste containers themselves are considered the primary barrier. A negative pressure differential ensures that any air leaks in the WHB structure will result in an in-leakage of outside air, which precludes the release of airborne contamination inside the WHB to the environment.

The underground ventilation system is composed of four subsystems with a common air supply. This dividing of the air supply inhibits the spread of contamination in the unlikely event that radioactive material becomes airborne. Separation of the subsystem air flows is maintained by the use of air locks until the flows are recombined at the exhaust shaft. A pressure differential is maintained between the subsystems to ensure that any air leakage flows from the non-radioactive material areas (least contamination potential) to the radioactive materials areas (highest contamination potential).

The WIPP facility uses skid-mounted fixed air samplers (FASs) at each emission point to collect representative samples of airborne particulates. Each emission point FAS has two independent vacuum pumps; one vacuum pump supplies the vacuum and the other functions as a backup. In the event of an external power failure, an uninterruptible power supply provides sufficient power to all FASs for approximately 30 minutes. Diesel generators are available to supply electrical power should the electrical outage last longer than 30 minutes.

Approved and controlled operating procedures are used at the WIPP facility to ensure that uniform methods are used to collect, package, and transport FAS filters. The use of such procedures provides a means for demonstrating quality assurance of air emission data. Station A FAS filters are collected as needed each working shift in order

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

to assure a representative sample. Station B FAS filters are collected weekly and at the end of each underground effluent filtration event, or as needed. Station C FAS filters are collected weekly, or as needed. Filters from all three stations are typically analyzed for ^{238}Pu , ^{239}Pu , ^{240}Pu , and ^{241}Am . These four radionuclides account for approximately 98 percent of the EDE resulting from the WIPP facility air emissions (DOE/WIPP 95-2065, WIPP Contact Handled Safety Analysis Report). The 98 percent is based upon the transuranic inventory expected at the WIPP. The FAS filters are also analyzed for beta activity if beta screening analysis indicates beta activity could contribute more than 0.01 mrem/year.

DISTANCES TO NEAREST RECEPTORS FROM RELEASE POINTS

The WIPP facility is located in a low population density area that has less than 30 permanent residents living within a 10-mile radius (DOE/WIPP 95-2065). The area surrounding the WIPP facility is used primarily for grazing and development of potash, oil, and gas resources. All land within the WIPP site boundary up to the "Exclusive Use Area" in the northwest sector is leased for grazing, which is the only significant agricultural activity in the vicinity of the WIPP facility. Development of the natural resources results in a transient (nonpermanent) population consisting primarily of workers at two active potash mines and numerous oil and gas wells located within 10 miles of the WIPP facility.

In compliance with 40 CFR Part 191, Subpart A, the location of the maximally exposed individual is the location where an actual individual lives or works who receives the maximum annual radiation dose from the source. *The Guidance For the Implementation of EPA's Standards for Management and Storage of Transuranic Waste (40 CFR Part 191, Subpart A) at the Waste Isolation Pilot Plant (EPA 402-R-97-001)*, states "The U.S. Environmental Protection Agency expects the DOE to examine radiation doses to individuals at any off-site point where there is a residence, school, business, or office. At the WIPP, consideration of business should include activities such as grazing, mining, or oil drilling in the vicinity of the site." Based on the above referenced EPA guidance document and WIPP's meteorological condition (i.e., the prevailing wind direction), the receptor selected is an individual at the WIPP fence line located 350 meters in the NW sector. This receptor has been selected as the location for the maximally exposed individual. For CY 2001, the EDE from normal operations at the WIPP DOE Exclusive Use Area located 350 meters was less than $9.7\text{E}-05$ mrem per year to the maximally exposed individual, and $1.69\text{E}-03$ for the critical organ. These results are well below the 25 mrem per year limit to the whole body, and the 75 mrem per year limit to any critical organ as required by 40 CFR Part 191, Subpart A, Section 191.03(b).

The Guidance for the Implementation of EPA's Standards for Management and Storage of Transuranic Waste (40 CFR Part 191, Subpart A) at the Waste Isolation Pilot Plant (EPA 402-R-97-001), further states "In implementing Subpart A at the WIPP, EPA expects DOE to analyze potential exposure pathways and then examine demographic information and conduct field investigations to identify the locations of actual individuals who could be exposed via those pathways. As a conservative simplifying assumption,

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

DOE could conduct separate analyses of potential doses received from each exposure pathway, then assume that a member of the public resides at the single geographic point on the surface where the maximum dose would be received. This dose can be calculated by summing the dose from all pathways to calculate the maximum dose to a member of the public at the single geographic point." Based on the above referenced EPA guidance document, demographic information, and WIPP's meteorological condition (i.e., the prevailing wind direction), the receptor selected is an individual at the Smith Ranch located 7,500 meters in the WNW sector. This receptor has been selected as the location for the maximally exposed individual. For CY 2001, the EDE from normal operations beyond the WIPP Land Withdrawal Area located 7,500 meters was less than 4.37E-06 mrem per year to the maximally exposed individual, and less than 7.60E-05 for the critical organ. These results are well below the 25 mrem per year limit to the whole body, and the 75 mrem per year limit to any critical organ as required by 40 CFR Part 191, Subpart A, Section 191.03(b).

INPUT DATA FOR CAP88-PC DOSE ASSESSMENT COMPUTER MODEL

Meteorological Data File: 96-2001.WND (met data for the WIPP site CY 1996-2001)

Population Data File: POP 2002.pop (population data for WIPP region)

Annual precipitation: 29 cm/yr (five-year average, 1997-2001)

Annual ambient temperature: 17°C (five-year average, 1997-2001)

Lid height: 1000 m

Agricultural Scenario: Local

Table 2. Characteristics of WIPP's Emission Points

Characteristics	Station A	Station B	Station C
Effective Station Height (m)	7.7	6.7	20.0
Effective Station Diameter (m)	5.2	1.8	2.6
Station Area (m ²)	21.2	2.6	6.8
Flow Rate (ft ³ /min)	4.25 x 10 ^{5**}	6.0 x 10 ⁴	4.7 x 10 ⁴
Flow Rate (m ³ /min)	1.2 x 10 ⁴	1699	1331
Exit Velocity (m/sec)	9.4	10.8	3.3
Effective Exit Velocity (m/sec)	6.7	NA	NA
Orientation	45° angle	vertical	vertical
Shape	rectangle	round	rectangle
HEPA filtered	no	yes	yes

** (two discharge fans)

DESCRIPTION OF CONSTRUCTION AND MODIFICATIONS COMPLETED DURING CY 2001 REPORTING PERIOD

Included below is a brief description of all construction and modifications on the effluent sampling stations during the 2001 calendar year.

During April 2001, the physical location of Station A Skids A-1 and A-3 were exchanged. Skid A-1 was moved to the location previously occupied by Skid A-3 and Skid A-3 was moved to the location previously occupied by Skid A-1. Each skid retained its original designation, each piece of equipment also retained its original equipment number, and all conduits were reconnected per design. Skid A-1 now samples air from the east probe and splitter and Skid A-3 samples air from the south probe and splitter. The reason for exchanging the location of the skids is to place the Record of Release skid (Skid A-3) in a sampling location that has proven to be much less prone to plugging with salt encrustation on the nozzle of the shrouded probe. The probes located on the south and west sides of Station A are less prone to plugging and salt encrustation. These probes are now the locations of Skid A-3 and Skid A-2, the Record of Release skid and its backup. Based on the current performance of the skids, this exchange of locations has achieved its intended purpose.

In 2001, the Energy Systems Laboratory of Texas A & M University was contracted to conduct tests to recommend the location(s) for fixed air sampler(s) (FAS) in the WIPP underground facility. The FAS unit(s), identified as Station D, collect representative samples of airborne particulates in the E300 drift exhaust, just prior to entering the exhaust shaft drift. Station D was designed according to the methodology specified by the American National Standards Institute (ANSI) Document N13.1, 1999. The FAS unit(s) at Station D have the same basic components and configuration as Stations A, B, and C. Installation of Station D at the qualified location was completed in August 2001. The EEG volunteered and initiated a one-month gravimetric study at Station D to verify operation of the unit as designed. EEG successfully completed the one-month gravimetric study at Station D on October 8, 2001. Station D was placed in operation on October 15, 2001. Both MOC the EEG personnel are currently collecting filter samples at this location.

Under the NESHAP regulatory requirements, Station A is our point of compliance for potential releases of nuclide. Data from Station D would be used to evaluate NESHAP compliance only if the primary, secondary, and tertiary FASs at Station A fail simultaneously, and there was a simultaneous accidental release of airborne radionuclides. Station D was reconfigured so air sampling for that section (airflow from waste disposal panels through E300) of the underground repository meets the requirements of ANSI N13.1-1999. Station D is not identified in any EPA document as an effluent point of release.

At the request of the users of the Station A Fixed Air Samplers, Westinghouse TRU Solutions LLC, Environmental Evaluation Group, and the Carlsbad Environmental Monitoring & Research Center, ball valves were installed at each effluent FAS at Station A. A total of 9 ball valves were installed, three each for each of the Station A

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

skids: Skid A-1, Skid A-2, and Skid A-3. These ball valves were installed in series with and upstream of each FAS to provide a shut-off feature and prevent loss of particulate sample filters due to back vacuum, during the filter removal and change-out process. This installation was successfully completed September 19, 2001.

MONITORING RESULTS

The monitoring activities at WIPP involve two individual programs. The primary program is used to detect for the presence of radionuclides within the exclusive use area. The secondary program provides a method to determine if any radioactive material has extended beyond the boundary of the facility. These programs are known as radiological monitoring and environmental monitoring, respectively.

The environmental monitoring involves sampling the air soil, surface water, groundwater, and biological life throughout the area surrounding the WIPP site. A summary of the annual laboratory data from the environmental sampling activities for the CY 2001 is presented in Table 3. A baseline inventory of the background radioactivity for these two calendar years can be found in the WIPP Site Environmental Report, which is produced annually.

It is not possible to directly compare the estimated activity release calculated for 40 CFR Part 191, Subpart A, to the measurements of radionuclide concentration made by Environmental Monitoring. The estimated releases are calculated assuming that a sample that did not contain radionuclides at the minimum detectable activity level. Consequently, the estimated release is conservatively high. The estimated releases are reported in Curies/year (Ci/Yr). For environmental monitoring, airborne concentrations are explicitly measured and reported in becquerels per cubic meter (Bq/m³).

OATH AND SIGNATURE

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment (see 18 U.S.C. §1001).

Signed: _____

Date: _____

Title: _____

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Table 3 - 2001 Annual Summary of Environmental Monitoring Activities

Sample Matrix	No. of Samples	Gross Alpha		Gross Beta		²⁴¹ Am		²³⁸ Pu	
		Mean	2SD	Mean	2SD	Mean	2SD	Mean	2SD
Air (Bq/m ³)	416	5.89E-05	5.90E-05	8.84E-04	6.39E-04	1.87E-08	4.88E-08	2.23E-08	9.37E-08
Soil (0-2 cm) (Bq/g dry)	7	N/A	N/A	N/A	N/A	7.80E-05	8.40E-05	1.55E-06	3.29E-05
Soil (2-5 cm) (Bq/g dry)	7	N/A	N/A	N/A	N/A	1.50E-04	1.37E-04	2.58E-05	8.22E-05
Soil (5-10 cm) (Bq/g dry)	7	N/A	N/A	N/A	N/A	1.02E-04	8.10E-05	2.99E-05	7.05E-05
Surface water (Bq/l)	10	N/A	N/A	N/A	N/A	2.64E-04	4.09E-04	2.17E-04	5.19E-04
Groundwater (Bq/l)	14	N/A	N/A	N/A	N/A	1.70E-04	2.84E-04	2.29E-04	5.07E-04
Sediments (Bq/g dry)	14	N/A	N/A	N/A	N/A	1.23E-04	3.53E-04	2.45E-05	1.20E-04
Vegetation (Bq/g wet)	7	N/A	N/A	N/A	N/A	4.92E-05	7.86E-05	7.09E-06	7.24E-05
Beef	0								
Deer (Bq/g wet)	3	N/A	N/A	N/A	N/A	3.14E-07	1.42E-06	2.74E-07	1.04E-06
Quail (Bq/g wet)	2	N/A	N/A	N/A	N/A	1.23E-06	3.40E-06	-1.01E-04	2.79E-04
Rabbit	1	N/A	N/A	N/A	N/A	1.84E-06	2.13E-06	0.00E+00	0.00E+00
Fish (Bq/g wet)	6	N/A	N/A	N/A	N/A	7.57E-07	1.12E-06	8.90E-07	2.96E-06

Sample Matrix	No. of Samples	²³⁹⁺²⁴⁰ Pu		²³³⁺²³⁴ U		²³⁵ U		²³⁸ U	
		Mean	2SD	Mean	2SD	Mean	2SD	Mean	2SD
Air (Bq/m ³)	416	1.62E-08	5.36E-08	2.96E-06	1.66E-06	1.69E-07	2.82E-07	2.90E-06	1.63E-06
Soil (0-2 cm) (Bq/g dry)	7	1.35E-04	1.13E-04	1.14E-02	2.87E-03	8.29E-04	7.04E-04	1.16E-02	2.31E-03
Soil (2-5 cm) (Bq/g dry)	7	1.63E-04	2.29E-04	1.28E-02	4.41E-03	7.39E-04	2.57E-04	1.35E-02	5.29E-03
Soil (5-10 cm) (Bq/g dry)	7	1.42E-04	1.96E-04	1.41E-02	5.09E-03	5.53E-04	2.64E-04	1.40E-02	5.05E-03
Surface water (Bq/l)	10	1.06E-04	2.94E-04	5.54E-02	1.26E-01	1.77E-03	3.73E-03	2.84E-02	6.06E-02
Groundwater (Bq/l)	14	-5.04E-05	2.40E-04	6.61E-01	8.67E-02	1.35E-02	8.72E-03	1.17E-01	1.37E-02
Sediments (Bq/g dry)	14	3.67E-04	1.27E-03	2.56E-02	1.61E-02	1.44E-03	6.86E-04	2.50E-02	8.37E-03
Vegetation (Bq/g wet)	7	-2.22E-07	1.71E-05	5.38E-04	3.90E-04	2.56E-05	4.62E-05	3.81E-04	2.12E-04
Beef	0								
Deer (Bq/g wet)	3	-2.05E-08	6.95E-08	1.07E-05	2.62E-05	1.44E-07	3.74E-07	7.92E-06	1.93E-05
Quail (Bq/g wet)	2	0.00E+00	0.00E+00	1.07E-03	2.93E-03	3.69E-05	1.06E-04	1.20E-03	3.32E-03
Rabbit	1	-6.18E-07	1.24E-06	4.81E-05	1.31E-05	5.11E-06	3.96E-06	3.89E-05	1.14E-05
Fish (Bq/g wet)	6	1.55E-07	5.54E-07	1.04E-04	9.99E-05	2.71E-06	2.74E-06	5.32E-05	5.00E-05

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Table 3 - 2001 Annual Summary of Environmental Monitoring Activities

Sample Matrix	No. of Samples	⁹⁰ Sr		⁶⁰ Co		¹³⁷ Cs		⁴⁰ K	
		Mean	2SD	Mean	2SD	Mean	2SD	Mean	2SD
Air (Bq/m ³)	416	2.01E-07	7.08E-06	6.32E-06	2.72E-05	-7.71E-07	3.35E-05	6.90E-04	3.11E-03
Soil (0-2 cm) (Bq/g dry)	7	3.42E-03	7.86E-03	1.14E-04	1.94E-04	3.25E-03	2.61E-03	3.00E-01	1.12E-01
Soil (2-5 cm) (Bq/g dry)	7	1.30E-03	8.57E-03	-9.32E-05	2.01E-04	4.51E-03	5.39E-03	3.16E-01	1.22E-01
Soil (5-10 cm) (Bq/g dry)	7	1.00E-03	5.85E-03	3.91E-05	2.55E-04	3.65E-03	5.02E-03	3.14E-01	1.31E-01
Surface water (Bq/l)	10	2.64E-04	3.71E-02	2.85E-02	3.82E-01	-4.14E-02	6.23E-01	1.60E+01	5.83E+01
Groundwater (Bq/l)	14	1.98E-03	6.46E-02	1.61E-01	3.44E-01	-1.12E-01	3.98E-01	1.96E+01	4.59E+00
Sediments (Bq/g dry)	14	3.19E-03	1.15E-02	2.84E-04	4.42E-04	7.56E-03	2.30E-02	5.85E-01	4.47E-01
Vegetation (Bq/g wet)	7	9.97E-03	5.23E-03	1.20E-03	3.16E-03	5.69E-04	8.29E-04	3.14E-01	2.14E-01
Beef	0								
Deer (Bq/g wet)	3	-9.77E-06	3.03E-05	2.06E-04	2.43E-04	-1.76E-04	7.60E-04	9.34E-02	3.85E-02
Quail (Bq/g wet)	2	1.55E-03	2.16E-03	1.77E-03	2.04E-03	2.09E-04	2.02E-04	1.41E-01	3.66E-01
Rabbit	1	-9.95E-05	1.38E-04	-4.85E-04	7.70E-04	-1.59E-04	5.59E-04	1.07E-01	1.74E-02
Fish (Bq/g wet)	6	5.66E-05	1.67E-04	-7.81E-05	5.45E-04	1.99E-04	1.34E-03	7.47E-02	3.12E-02

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

2001 Report Summary CAP88-PC Output Data

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Effective Dose Equivalent
(mrem/year)

9.70E-05

At This Location: 350 Meters Northwest
Dataset Name: 02BECRa
Dataset Date: Aug 19, 2002 04:04 pm
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

SYNOPSIS
Page 1

MAXIMALLY EXPOSED INDIVIDUAL

Location of the Individual: 350 Meters Northwest
Lifetime Fatal Cancer Risk: 4.98E-10

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
-----	-----
GONADS	2.17E-05
BREAST	2.18E-06
R MAR	1.37E-04
LUNGS	1.40E-05
THYROID	2.14E-06
ENDOST	1.69E-03
RMNDR	7.49E-05
EFFEC	9.70E-05

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

SYNOPSIS
Page 2

RADIONUCLIDE EMISSIONS DURING THE YEAR 2001

Nuclide	Class	Size	Source #1 Ci/y	Source #2 Ci/y	Source #3 Ci/y	TOTAL Ci/y
AM-241	W	1.00	7.7E-08	3.7E-09	9.9E-09	9.0E-08
PU-238	W	1.00	4.6E-08	2.7E-09	7.2E-09	5.6E-08
PU-239	W	1.00	4.6E-08	9.3E-10	2.4E-09	5.0E-08

SITE INFORMATION

Temperature: 17 degrees C
Precipitation: 29 cm/y
Mixing Height: 1000 m

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

SYNOPSIS
Page 3

SOURCE INFORMATION

Source Number:	1	2	3
Stack Height (m):	8	7	20
Diameter (m):	5	2	3
Plume Rise Momentum (m/s): (Exit Velocity)	7	11	3

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	1.000	1.000	1.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES (M) USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

350

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

GENERAL DATA

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 19, 2002 04:04 pm
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

GENERAL
Page 1

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Scavenging Coefficient (per second)	Dry Deposition Velocity (m/s)
AM-241	W	1.0	2.90E-06	1.80E-03
PU-238	W	1.0	2.90E-06	1.80E-03
PU-239	W	1.0	2.90E-06	1.80E-03

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

GENERAL
Page 2

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	DECAY CONSTANT (PER DAY)		TRANSFER COEFFICIENT		
	Radioactive ⁽¹⁾	Surface	Water	Milk ⁽²⁾	Meat ⁽³⁾
AM-241	0.00E+00	5.48E-05	0.00E+00	4.00E-07	3.50E-06
PU-238	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
PU-239	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07

- FOOTNOTES:
- (1) Effective radioactive decay constant in plume; set to zero if less than 1.0E-2
 - (2) Fraction of animal's daily intake of nuclide which appears in each L of milk (days/L)
 - (3) Fraction of animal's daily intake of nuclide which appears in each kilogram of meat (days/kg)
-

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

GENERAL
Page 3

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	CONCENTRATION UPTAKE FACTOR		GI UPTAKE FRACTION	
	Forage (1)	Edible (2)	Inhalation	Ingestion
AM-241	5.50E-03	1.07E-04	1.00E-03	1.00E-03
PU-238	4.50E-04	1.93E-05	1.00E-03	1.00E-03
PU-239	4.50E-04	1.93E-05	1.00E-04	1.00E-03

FOOTNOTES: (1) Concentration factor for uptake of nuclide from soil for pasture and forage (in pCi/kg dry weight per pCi/kg dry soil)

(2) Concentration factor for uptake of nuclide from soil by edible parts of crops (in pCi/kg wet weight per pCi/kg dry soil)

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

GENERAL
Page 4

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE	
Cubic centimeters/hr	9.17E+05
SOIL PARAMETERS	
Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
BUILDUP TIMES	
For activity in soil (years)	1.00E+02
For radionuclides deposited on ground/water (days)	3.65E+04
DELAY TIMES	
Ingestion of pasture grass by animals (hr)	0.00E+00
Ingestion of stored feed by animals (hr)	2.16E+03
Ingestion of leafy vegetables by man (hr)	3.36E+02
Ingestion of produce by man (hr)	3.36E+02
Transport time from animal feed-milk-man (day)	2.00E+00
Time from slaughter to consumption (day)	2.00E+01
WEATHERING	
Removal rate constant for physical loss (per hr)	2.90E-03
CROP EXPOSURE DURATION	
Pasture grass (hr)	7.20E+02
Crops/leafy vegetables (hr)	1.44E+03
AGRICULTURAL PRODUCTIVITY	
Grass-cow-milk-man pathway (kg/sq m)	2.80E-01
Produce/leafy veg for human consumption (kg/sq m)	7.16E-01
FALLOUT INTERCEPTION FRACTIONS	
Vegetables	2.00E-01
Pasture	5.70E-01
GRAZING PARAMETERS	
Fraction of year animals graze on pasture	4.00E-01
Fraction of daily feed that is pasture grass when animal grazes on pasture	4.30E-01

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

GENERAL
Page 5

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

ANIMAL FEED CONSUMPTION FACTORS

Contaminated feed/forage (kg/day, dry weight) 1.56E+01

DAIRY PRODUCTIVITY

Milk production of cow (L/day) 1.10E+01

MEAT ANIMAL SLAUGHTER PARAMETERS

Muscle mass of animal at slaughter (kg) 2.00E+02

Fraction of herd slaughtered (per day) 3.81E-03

DECONTAMINATION

Fraction of radioactivity retained after washing for leafy vegetables and produce 5.00E-01

FRACTIONS GROWN IN GARDEN OF INTEREST

Produce ingested 1.00E+00

Leafy vegetables ingested 1.00E+00

INGESTION RATIOS:

IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA

Vegetables 1.00E+00

Meat 1.00E+00

Milk 1.00E+00

MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA

(Minimum fractions of food types from outside area listed below are actual fixed values.)

Vegetables 0.00E+00

Meat 0.00E+00

Milk 0.00E+00

HUMAN FOOD UTILIZATION FACTORS

Produce ingestion (kg/y) 1.76E+02

Milk ingestion (L/y) 1.12E+02

Meat ingestion (kg/y) 8.50E+01

Leafy vegetable ingestion (kg/y) 1.80E+01

SWIMMING PARAMETERS

Fraction of time spent swimming 0.00E+00

Dilution factor for water (cm) 1.00E+00

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

W E A T H E R D A T A

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 19, 2002 04:04 pm
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

WEATHER
Page 1

HARMONIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class

Dir	A	B	C	D	E	F	G	Wind Freq
N	4.874	3.837	3.439	2.924	2.783	2.009	0.000	0.067
NNW	5.361	4.424	3.855	3.891	4.699	2.673	0.000	0.113
NW	5.433	4.543	4.190	4.687	5.219	3.365	0.000	0.171
WNW	4.972	4.286	4.028	4.024	4.684	3.596	0.000	0.139
W	4.993	4.143	3.790	4.345	4.426	2.960	0.000	0.071
WSW	4.830	4.207	3.823	4.247	4.283	2.677	0.000	0.044
SW	5.120	4.308	3.479	4.029	3.527	2.495	0.000	0.040
SSW	5.135	3.868	3.711	3.869	3.237	2.477	0.000	0.041
S	4.813	3.753	3.555	3.348	3.103	2.455	0.000	0.038
SSE	5.202	3.763	3.505	2.986	2.889	2.468	0.000	0.033
SE	4.515	3.681	2.950	2.286	2.883	2.066	0.000	0.030
ESE	4.386	3.226	2.770	2.218	2.703	2.022	0.000	0.031
E	5.997	3.903	3.324	3.042	4.085	2.424	0.000	0.052
ENE	5.183	3.427	3.110	2.749	3.302	2.502	0.000	0.047
NE	4.565	3.327	2.706	2.110	2.589	2.063	0.000	0.038
NNE	4.551	3.537	3.040	2.479	2.449	1.851	0.000	0.046

ARITHMETIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class

Dir	A	B	C	D	E	F	G
N	6.177	5.473	5.422	5.415	5.345	4.105	0.000
NNW	6.796	6.186	5.756	6.207	6.858	4.735	0.000
NW	6.869	6.213	6.137	6.826	7.036	5.268	0.000
WNW	6.371	5.835	5.776	6.258	6.602	5.258	0.000
W	6.486	5.613	5.720	6.849	6.727	5.122	0.000
WSW	6.505	6.426	5.924	6.945	6.714	5.084	0.000
SW	6.864	6.356	5.919	6.639	6.538	4.678	0.000
SSW	6.553	5.741	5.845	6.211	5.761	4.611	0.000
S	6.081	5.134	5.487	5.438	5.188	4.419	0.000
SSE	6.740	5.293	5.358	5.488	5.285	4.660	0.000
SE	5.771	5.053	4.759	4.684	5.568	4.337	0.000
ESE	5.848	4.799	4.686	5.199	5.694	4.389	0.000
E	7.917	6.445	6.281	6.851	6.655	4.904	0.000
ENE	6.929	5.723	5.402	5.959	5.836	4.986	0.000
NE	6.228	5.155	4.482	4.805	5.283	4.483	0.000

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

WEATHER
Page 2

FREQUENCIES OF STABILITY CLASSES (WIND TOWARDS)

Pasquill Stability Class							
Dir	A	B	C	D	E	F	G
NNE	6.007	5.321	5.255	5.084	4.995	4.050	0.000
N	0.4256	0.0715	0.0578	0.1204	0.1049	0.2199	0.0000
NNW	0.2993	0.0514	0.0426	0.1355	0.2185	0.2527	0.0000
NW	0.1620	0.0313	0.0290	0.1270	0.2871	0.3636	0.0000
WNW	0.0975	0.0230	0.0233	0.1052	0.2076	0.5434	0.0000
W	0.1193	0.0322	0.0329	0.1843	0.2477	0.3837	0.0000
WSW	0.1202	0.0387	0.0428	0.2218	0.2161	0.3605	0.0000
SW	0.1409	0.0380	0.0423	0.2134	0.1509	0.4146	0.0000
SSW	0.1510	0.0439	0.0493	0.2190	0.1402	0.3966	0.0000
S	0.1712	0.0576	0.0584	0.2174	0.1755	0.3199	0.0000
SSE	0.2163	0.0723	0.0651	0.2178	0.1485	0.2799	0.0000
SE	0.2279	0.0903	0.0930	0.1962	0.1356	0.2570	0.0000
ESE	0.2792	0.0861	0.0795	0.1774	0.1385	0.2393	0.0000
E	0.3819	0.0707	0.0652	0.1703	0.1498	0.1621	0.0000
ENE	0.4018	0.0804	0.0695	0.1583	0.1217	0.1682	0.0000
NE	0.4202	0.0949	0.0723	0.1375	0.1025	0.1725	0.0000
NNE	0.4463	0.0917	0.0709	0.1192	0.0850	0.1870	0.0000
TOTAL	0.2332	0.0516	0.0470	0.1537	0.1897	0.3247	0.0000

ADDITIONAL WEATHER INFORMATION

Average Air Temperature: 17.0 degrees C
290.16 K
Precipitation: 29.0 cm/y
Lid Height: 1000 meters
Surface Roughness Length: 0.010 meters
Height of Wind Measurements: 10.0 meters
Average Wind Speed: 5.869 m/s

Vertical Temperature Gradients:

STABILITY E 0.073 k/m
STABILITY F 0.109 k/m
STABILITY G 0.146 k/m

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 19, 2002 04:04 pm
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
-----	-----
GONADS	2.17E-05
BREAST	2.18E-06
R MAR	1.37E-04
LUNGS	1.40E-05
THYROID	2.14E-06
ENDOST	1.69E-03
RMNDR	7.49E-05
EFFEC	9.70E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
-----	-----
INGESTION	6.24E-06
INHALATION	9.08E-05
AIR IMMERSION	9.15E-13
GROUND SURFACE	3.87E-08
INTERNAL	9.70E-05
EXTERNAL	3.87E-08
TOTAL	9.70E-05

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
-----	-----
AM-241	4.66E-05
PU-238	2.51E-05
PU-239	2.53E-05
TOTAL	9.70E-05

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
LEUKEMIA	1.16E-10
BONE	7.45E-11
THYROID	2.49E-13
BREAST	1.86E-12
LUNG	3.95E-11
STOMACH	1.37E-12
BOWEL	7.93E-13
LIVER	2.62E-10
PANCREAS	1.01E-12
URINARY	5.32E-13
OTHER	1.24E-12
TOTAL	4.98E-10

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
INGESTION	3.01E-11
INHALATION	4.68E-10
AIR IMMERSION	1.90E-17
GROUND SURFACE	8.05E-13
INTERNAL	4.98E-10
EXTERNAL	8.05E-13
TOTAL	4.98E-10

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
AM-241	2.38E-10
PU-238	1.33E-10
PU-239	1.27E-10
TOTAL	4.98E-10

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	350
-----------	-----

N	4.6E-05
NNW	7.3E-05
NW	9.7E-05
WNW	6.4E-05
W	4.6E-05
WSW	3.1E-05
SW	2.7E-05
SSW	2.7E-05
S	2.8E-05
SSE	2.7E-05
SE	2.8E-05
ESE	3.0E-05
E	4.2E-05
ENE	3.9E-05
NE	3.3E-05
NNE	3.5E-05

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	350
-----------	-----

N	2.3E-10
NNW	3.7E-10
NW	5.0E-10
WNW	3.3E-10
W	2.4E-10
WSW	1.6E-10
SW	1.4E-10
SSW	1.4E-10
S	1.4E-10
SSE	1.4E-10
SE	1.4E-10
ESE	1.5E-10
E	2.2E-10
ENE	2.0E-10
NE	1.7E-10
NNE	1.8E-10

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C O N C E N T R A T I O N T A B L E S

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

CONCEN
Page 1

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Concentration Nuclide	Air Rate (pCi/m3)	Dry Deposition Rate (pCi/cm2/s)	Wet Deposition Rate (pCi/cm2/s)	Ground Deposition (pCi/cm2/s)
N	350	AM-241	4.7E-09	8.5E-16	1.2E-16	9.7E-16
N	350	PU-238	2.9E-09	5.3E-16	7.7E-17	6.0E-16
N	350	PU-239	2.6E-09	4.7E-16	6.8E-17	5.4E-16
NNW	350	AM-241	7.5E-09	1.4E-15	1.7E-16	1.5E-15
NNW	350	PU-238	4.7E-09	8.4E-16	1.1E-16	9.4E-16
NNW	350	PU-239	4.2E-09	7.5E-16	9.5E-17	8.5E-16
NW	350	AM-241	1.0E-08	1.8E-15	2.4E-16	2.0E-15
NW	350	PU-238	6.2E-09	1.1E-15	1.5E-16	1.3E-15
NW	350	PU-239	5.6E-09	1.0E-15	1.3E-16	1.1E-15
WNW	350	AM-241	6.6E-09	1.2E-15	2.1E-16	1.4E-15
WNW	350	PU-238	4.1E-09	7.3E-16	1.3E-16	8.6E-16
WNW	350	PU-239	3.6E-09	6.6E-16	1.2E-16	7.7E-16
W	350	AM-241	4.8E-09	8.6E-16	1.1E-16	9.7E-16
W	350	PU-238	3.0E-09	5.3E-16	7.1E-17	6.0E-16
W	350	PU-239	2.7E-09	4.8E-16	6.3E-17	5.4E-16
WSW	350	AM-241	3.2E-09	5.7E-16	7.4E-17	6.4E-16
WSW	350	PU-238	2.0E-09	3.5E-16	4.6E-17	4.0E-16
WSW	350	PU-239	1.8E-09	3.2E-16	4.1E-17	3.6E-16
SW	350	AM-241	2.8E-09	5.0E-16	7.4E-17	5.7E-16
SW	350	PU-238	1.7E-09	3.1E-16	4.6E-17	3.5E-16
SW	350	PU-239	1.5E-09	2.8E-16	4.1E-17	3.2E-16
SSW	350	AM-241	2.8E-09	5.0E-16	7.6E-17	5.8E-16
SSW	350	PU-238	1.7E-09	3.1E-16	4.7E-17	3.6E-16
SSW	350	PU-239	1.6E-09	2.8E-16	4.2E-17	3.2E-16
S	350	AM-241	2.9E-09	5.2E-16	7.2E-17	5.9E-16
S	350	PU-238	1.8E-09	3.2E-16	4.5E-17	3.7E-16
S	350	PU-239	1.6E-09	2.9E-16	4.0E-17	3.3E-16
SSE	350	AM-241	2.8E-09	5.0E-16	6.3E-17	5.6E-16
SSE	350	PU-238	1.7E-09	3.1E-16	3.9E-17	3.5E-16
SSE	350	PU-239	1.5E-09	2.8E-16	3.5E-17	3.1E-16
SE	350	AM-241	2.9E-09	5.2E-16	6.5E-17	5.8E-16
SE	350	PU-238	1.8E-09	3.2E-16	4.1E-17	3.6E-16
SE	350	PU-239	1.6E-09	2.9E-16	3.6E-17	3.2E-16
ESE	350	AM-241	3.1E-09	5.5E-16	6.7E-17	6.2E-16
ESE	350	PU-238	1.9E-09	3.4E-16	4.2E-17	3.8E-16
ESE	350	PU-239	1.7E-09	3.1E-16	3.7E-17	3.4E-16
E	350	AM-241	4.4E-09	7.9E-16	8.1E-17	8.7E-16
E	350	PU-238	2.7E-09	4.9E-16	5.1E-17	5.4E-16
E	350	PU-239	2.4E-09	4.4E-16	4.5E-17	4.8E-16
ENE	350	AM-241	4.0E-09	7.2E-16	7.9E-17	8.0E-16

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

CONCEN
Page 2

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Concentration Nuclide	Air Rate (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition (pCi/cm ² /s)
ENE	350	PU-238	2.5E-09	4.5E-16	4.9E-17	5.0E-16
ENE	350	PU-239	2.2E-09	4.0E-16	4.4E-17	4.4E-16
NE	350	AM-241	3.4E-09	6.1E-16	7.5E-17	6.9E-16
NE	350	PU-238	2.1E-09	3.8E-16	4.7E-17	4.3E-16
NE	350	PU-239	1.9E-09	3.4E-16	4.2E-17	3.8E-16
NNE	350	AM-241	3.6E-09	6.6E-16	9.1E-17	7.5E-16
NNE	350	PU-238	2.3E-09	4.1E-16	5.7E-17	4.6E-16
NNE	350	PU-239	2.0E-09	3.6E-16	5.0E-17	4.1E-16

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK CONVERSION FACTORS

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 19, 2002 04:04 pm
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

FACTOR
Page 1

DOSE AND RISK FACTOR UNITS

The units for each type of dose rate conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	millirem/picoCurie
Inhalation	millirem/picoCurie
Immersion	millirem-cubic cm/microCurie-year
Surface	millirem-square cm/microCurie-year

Risks for internal exposures (inhalation and ingestion) are the lifetime risk of premature death in a birth cohort of 100,000 people for a 1 picoCurie/year intake rate, where the average lifetime is 70.7565 years.

This is simplified to lifetime risk per 100,000 picoCuries.

The units for each type of risk conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	lifetime risk/100,000 picoCuries
Inhalation	lifetime risk/100,000 picoCuries
Immersion	lifetime risk-cubic cm/100,000 picoCurie-years
Surface	lifetime risk-square cm/100,000 picoCurie-years

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

FACTOR
Page 2

* NUCLIDE AM-241 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	1.001E-03	1.212E-01	1.151E+08	3.541E+04
BREAST	9.709E-05	1.176E-02	1.469E+08	5.550E+04
R MAR	6.327E-03	7.663E-01	3.737E+07	1.077E+04
LUNGS	9.714E-05	8.047E-02	6.919E+07	2.009E+04
THYROID	9.703E-05	1.175E-02	1.099E+08	3.175E+04
ENDOST	7.801E-02	9.447E+00	1.273E+08	3.693E+04
RMNDR	3.508E-03	4.176E-01	6.778E+07	1.937E+04
EFFEC	4.430E-03	5.428E-01	9.104E+07	2.875E+04

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	9.208E-03	1.110E+00	3.452E+09	1.062E+06
OVARIES	9.232E-03	1.112E+00	1.521E+09	4.384E+05
AVERAGE	9.221E-03	1.111E+00	2.486E+09	7.504E+05

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.337E-04	6.457E-02	1.184E+01	3.410E-03
BONE	3.433E-04	4.152E-02	2.253E+00	6.535E-04
THYROID	1.062E-06	1.283E-04	4.998E+00	1.444E-03
BREAST	7.158E-06	8.639E-04	5.751E+01	2.174E-02
LUNG	9.643E-06	2.284E-02	3.429E+01	9.960E-03
STOMACH	6.586E-06	7.140E-04	1.852E+01	5.317E-03
BOWEL	1.094E-05	3.603E-04	8.526E+00	2.445E-03
LIVER	1.198E-03	1.448E-01	2.179E+01	6.239E-03
PANCREAS	4.480E-06	5.408E-04	9.503E+00	2.760E-03
URINARY	2.298E-06	2.773E-04	8.681E+00	2.479E-03
OTHER	5.479E-06	6.614E-04	1.162E+01	3.376E-03

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.197E-10	3.843E-08	6.464E+02	1.951E-01
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

FACTOR
Page 3

* NUCLIDE PU-238 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	8.603E-04	1.041E-01	4.218E+05	7.548E+02
BREAST	8.419E-05	1.020E-02	1.806E+06	4.070E+03
R MAR	5.485E-03	6.641E-01	5.291E+04	4.514E+01
LUNGS	8.419E-05	7.893E-02	1.177E+05	1.225E+02
THYROID	8.419E-05	1.020E-02	1.709E+05	1.510E+02
ENDOST	6.763E-02	8.189E+00	2.090E+05	2.050E+02
RMNDR	3.085E-03	3.666E-01	8.732E+04	7.659E+01
EFFEC	3.853E-03	4.726E-01	4.344E+05	8.530E+02

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	8.657E-03	1.043E+00	1.265E+07	2.264E+04
OVARIES	8.673E-03	1.045E+00	2.331E+06	2.087E+03
AVERAGE	8.665E-03	1.044E+00	7.492E+06	1.237E+04

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	4.695E-04	5.676E-02	1.676E-02	1.430E-05
BONE	3.046E-04	3.681E-02	3.700E-03	3.628E-06
THYROID	9.438E-07	1.140E-04	7.775E-03	6.866E-06
BREAST	6.493E-06	7.839E-04	7.072E-01	1.594E-03
LUNG	8.684E-06	2.272E-02	5.833E-02	6.072E-05
STOMACH	5.991E-06	6.480E-04	2.550E-02	1.840E-05
BOWEL	1.016E-05	3.272E-04	1.083E-02	6.451E-06
LIVER	1.099E-03	1.327E-01	2.503E-02	9.235E-06
PANCREAS	4.054E-06	4.895E-04	1.656E-02	1.864E-05
URINARY	2.080E-06	2.511E-04	1.007E-02	3.352E-06
OTHER	4.959E-06	5.987E-04	2.026E-02	2.280E-05

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	2.992E-10	3.604E-08	1.948E+00	3.216E-03
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

FACTOR
Page 4

* NUCLIDE PU-239 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	9.741E-04	1.180E-01	4.329E+05	3.463E+02
BREAST	9.453E-05	1.145E-02	9.990E+05	1.617E+03
R MAR	6.166E-03	7.471E-01	1.950E+05	5.587E+01
LUNGS	9.453E-05	7.609E-02	2.420E+05	8.954E+01
THYROID	9.453E-05	1.145E-02	3.385E+05	1.165E+02
ENDOST	7.593E-02	9.199E+00	3.996E+05	1.473E+02
RMNDR	3.399E-03	4.054E-01	2.250E+05	6.734E+01
EFFEC	4.310E-03	5.278E-01	4.002E+05	3.747E+02

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	8.801E-03	1.061E+00	1.299E+07	1.039E+04
OVARIES	8.777E-03	1.058E+00	5.506E+06	1.798E+03
AVERAGE	8.789E-03	1.059E+00	9.246E+06	6.094E+03

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.183E-04	6.271E-02	6.176E-02	1.770E-05
BONE	3.323E-04	4.019E-02	7.072E-03	2.606E-06
THYROID	1.027E-06	1.242E-04	1.540E-02	5.301E-06
BREAST	6.868E-06	8.298E-04	3.913E-01	6.333E-04
LUNG	9.263E-06	2.149E-02	1.200E-01	4.439E-05
STOMACH	6.254E-06	6.858E-04	6.736E-02	1.961E-05
BOWEL	9.813E-06	3.457E-04	3.275E-02	8.719E-06
LIVER	1.148E-03	1.387E-01	7.186E-02	1.699E-05
PANCREAS	4.289E-06	5.181E-04	4.236E-02	1.502E-05
URINARY	2.200E-06	2.658E-04	2.614E-02	6.081E-06
OTHER	5.246E-06	6.337E-04	5.181E-02	1.838E-05

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.034E-10	3.656E-08	2.404E+00	1.584E-03
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C H I / Q T A B L E S

Non-Radon Individual Assessment
Aug 19, 2002 04:04 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 19, 2002 04:04 pm
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 19, 2002 04:04 pm

CHIQ
Page 1

GROUND-LEVEL CHI/Q VALUES FOR AM-241
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	350
-----------	-----

N	1.643E-06
NNW	2.621E-06
NW	3.491E-06
WNW	2.293E-06
W	1.664E-06
WSW	1.109E-06
SW	9.624E-07
SSW	9.773E-07
S	1.008E-06
SSE	9.731E-07
SE	1.003E-06
ESE	1.069E-06
E	1.529E-06
ENE	1.397E-06
NE	1.186E-06
NNE	1.274E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

CHI/Q
Page 2

GROUND-LEVEL CHI/Q VALUES FOR PU-238
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	350
-----------	-----

N	1.641E-06
NNW	2.612E-06
NW	3.478E-06
WNW	2.289E-06
W	1.658E-06
WSW	1.105E-06
SW	9.596E-07
SSW	9.753E-07
S	1.007E-06
SSE	9.715E-07
SE	1.002E-06
ESE	1.067E-06
E	1.523E-06
ENE	1.394E-06
NE	1.186E-06
NNE	1.273E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 19, 2002 04:04 pm

CHI/Q
Page 3

GROUND-LEVEL CHI/Q VALUES FOR PU-239
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	350
N	1.652E-06
NNW	2.653E-06
NW	3.541E-06
WNW	2.311E-06
W	1.686E-06
WSW	1.124E-06
SW	9.734E-07
SSW	9.856E-07
S	1.015E-06
SSE	9.797E-07
SE	1.008E-06
ESE	1.077E-06
E	1.549E-06
ENE	1.410E-06
NE	1.191E-06
NNE	1.279E-06

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Aug 26, 2002 09:44 am

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Effective Dose Equivalent
(mrem/year)

4.37E-06

At This Location: 7,500 Meters Northwest
Dataset Name: 02BECRa
Dataset Date: Aug 26, 2002 09:44 am
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SYNOPSIS
Page 1

MAXIMALLY EXPOSED INDIVIDUAL

Location of the Individual: 7,500 Meters Northwest
Lifetime Fatal Cancer Risk: 2.24E-11

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	9.75E-07
BREAST	9.90E-08
R MAR	6.17E-06
LUNGS	6.19E-07
THYROID	9.70E-08
ENDOST	7.60E-05
RMNDR	3.37E-06
EFFEC	4.37E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SYNOPSIS
Page 2

RADIONUCLIDE EMISSIONS DURING THE YEAR 2001

Nuclide	Class	Size	Source #1 Ci/y	Source #2 Ci/y	Source #3 Ci/y	TOTAL Ci/y
AM-241	W	1.00	7.7E-08	3.7E-09	9.9E-09	9.1E-08
PU-238	W	1.00	4.6E-08	2.7E-09	7.2E-09	5.6E-08
PU-239	W	1.00	4.6E-08	9.3E-10	2.4E-09	4.9E-08

SITE INFORMATION

Temperature: 10 degrees C
Precipitation: 100 cm/y
Mixing Height: 1000 m

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SYNOPSIS
Page 3

SOURCE INFORMATION

Source Number:	1	2	3
	-----	-----	-----
Stack Height (m):	8	7	20
Diameter (m):	5	2	3
Plume Rise			
Momentum (m/s):	7	11	3
(Exit Velocity)			

AGRICULTURAL DATA

	Vegetable	Milk	Meat
	-----	-----	-----
Fraction Home Produced:	1.000	1.000	1.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES (M) USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

7,500

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

GENERAL DATA

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

GENERAL
Page 1

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Dry Scavenging Coefficient (per second)	Deposition Velocity (m/s)
AM-241	W	1.0	1.0E-05	1.80E-03
PU-238	W	1.0	1.00E-05	1.80E-03
PU-239	W	1.0	1.00E-05	1.80E-03

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

GENERAL
Page 2

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	DECAY CONSTANT (PER DAY)		TRANSFER COEFFICIENT		
	Radioactive (1)	Surface	Water	Milk (2)	Meat (3)
AM-241	0.00E+00	5.48E-05	0.00E+00	4.00E-07	3.50E-06
PU-238	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
PU-239	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07

- FOOTNOTES:
- (1) Effective radioactive decay constant in plume; set to zero if less than 1.0E-2
 - (2) Fraction of animal's daily intake of nuclide which appears in each L of milk (days/l)
 - (3) Fraction of animal's daily intake of nuclide which appears in each kg of meat (days/kg)
-

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

GENERAL
Page 3

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	CONCENTRATION UPTAKE FACTOR		GI UPTAKE FRACTION	
	Forage (1)	Edible (2)	Inhalation	Ingestion
AM-241	5.50E-03	1.07E-04	1.00E-03	1.00E-03
PU-238	4.50E-04	1.93E-05	1.00E-03	1.00E-03
PU-239	4.50E-04	1.93E-05	1.00E-04	1.00E-03

FOOTNOTES: (1) Concentration factor for uptake of nuclide from soil for pasture and forage (in pCi/kg dry weight per pCi/kg dry soil)

(2) Concentration factor for uptake of nuclide from soil by edible parts of crops (in pCi/kg wet weight per pCi/kg dry soil)

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

GENERAL
Page 4

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE	
Cubic centimeters/hr	9.17E+05
SOIL PARAMETERS	
Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
BUILDUP TIMES	
For activity in soil (years)	1.00E+02
For radionuclides deposited on ground/water (days)	3.65E+04
DELAY TIMES	
Ingestion of pasture grass by animals (hr)	0.00E+00
Ingestion of stored feed by animals (hr)	2.16E+03
Ingestion of leafy vegetables by man (hr)	3.36E+02
Ingestion of produce by man (hr)	3.36E+02
Transport time from animal feed-milk-man (day)	2.00E+00
Time from slaughter to consumption (day)	2.00E+01
WEATHERING	
Removal rate constant for physical loss (per hr)	2.90E-03
CROP EXPOSURE DURATION	
Pasture grass (hr)	7.20E+02
Crops/leafy vegetables (hr)	1.44E+03
AGRICULTURAL PRODUCTIVITY	
Grass-cow-milk-man pathway (kg/sq m)	2.80E-01
Produce/leafy veg for human consumption (kg/sq m)	7.16E-01
FALLOUT INTERCEPTION FRACTIONS	
Vegetables	2.00E-01
Pasture	5.70E-01
GRAZING PARAMETERS	
Fraction of year animals graze on pasture	4.00E-01
Fraction of daily feed that is pasture grass when animal grazes on pasture	4.30E-01

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

GENERAL
Page 5

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

ANIMAL FEED CONSUMPTION FACTORS

Contaminated feed/forage (kg/day, dry weight) 1.56E+01

DAIRY PRODUCTIVITY

Milk production of cow (L/day) 1.10E+01

MEAT ANIMAL SLAUGHTER PARAMETERS

Muscle mass of animal at slaughter (kg) 2.00E+02

Fraction of herd slaughtered (per day) 3.81E-03

DECONTAMINATION

Fraction of radioactivity retained after washing
for leafy vegetables and produce 5.00E-01

FRACTIONS GROWN IN GARDEN OF INTEREST

Produce ingested 1.00E+00

Leafy vegetables ingested 1.00E+00

INGESTION RATIOS:

IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA

Vegetables 1.00E+00

Meat 1.00E+00

Milk 1.00E+00

MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA

(Minimum fractions of food types from outside
area listed below are actual fixed values.)

Vegetables 0.00E+00

Meat 0.00E+00

Milk 0.00E+00

HUMAN FOOD UTILIZATION FACTORS

Produce ingestion (kg/y) 1.76E+02

Milk ingestion (L/y) 1.12E+02

Meat ingestion (kg/y) 8.50E+01

Leafy vegetable ingestion (kg/y) 1.80E+01

SWIMMING PARAMETERS

Fraction of time spent swimming 0.00E+00

Dilution factor for water (cm) 1.00E+00

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

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W E A T H E R D A T A

Non-Radon Individual Assessment
Aug 26, 2002 09:44 am

Facility: Waste Isolation Pilot Plant
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
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Aug 26, 2002 09:44 am

WEATHER
Page 1

HARMONIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class

Dir	A	B	C	D	E	F	G	Wind Freq
N	4.874	3.837	3.439	2.924	2.783	2.009	0.000	0.067
NNW	5.361	4.424	3.855	3.891	4.699	2.673	0.000	0.113
NW	5.433	4.543	4.190	4.687	5.219	3.365	0.000	0.171
WNW	4.972	4.286	4.028	4.024	4.684	3.596	0.000	0.139
W	4.993	4.143	3.790	4.345	4.426	2.960	0.000	0.071
WSW	4.830	4.207	3.823	4.247	4.283	2.677	0.000	0.044
SW	5.120	4.308	3.479	4.029	3.527	2.495	0.000	0.040
SSW	5.135	3.868	3.711	3.869	3.237	2.477	0.000	0.041
S	4.813	3.753	3.555	3.348	3.103	2.455	0.000	0.038
SSE	5.202	3.763	3.505	2.986	2.889	2.468	0.000	0.033
SE	4.515	3.681	2.950	2.286	2.883	2.066	0.000	0.030
ESE	4.386	3.226	2.770	2.218	2.703	2.022	0.000	0.031
E	5.997	3.903	3.324	3.042	4.085	2.424	0.000	0.052
ENE	5.183	3.427	3.110	2.749	3.302	2.502	0.000	0.047
NE	4.565	3.327	2.706	2.110	2.589	2.063	0.000	0.038
NNE	4.551	3.537	3.040	2.479	2.449	1.851	0.000	0.046

ARITHMETIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class

Dir	A	B	C	D	E	F	G
N	6.177	5.473	5.422	5.415	5.345	4.105	0.000
NNW	6.796	6.186	5.756	6.207	6.858	4.735	0.000
NW	6.869	6.213	6.137	6.826	7.036	5.268	0.000
WNW	6.371	5.835	5.776	6.258	6.602	5.258	0.000
W	6.486	5.613	5.720	6.849	6.727	5.122	0.000
WSW	6.505	6.426	5.924	6.945	6.714	5.084	0.000
SW	6.864	6.356	5.919	6.639	6.538	4.678	0.000
SSW	6.553	5.741	5.845	6.211	5.761	4.611	0.000
S	6.081	5.134	5.487	5.438	5.188	4.419	0.000
SSE	6.740	5.293	5.358	5.488	5.285	4.660	0.000
SE	5.771	5.053	4.759	4.684	5.568	4.337	0.000
ESE	5.848	4.799	4.686	5.199	5.694	4.389	0.000
E	7.917	6.445	6.281	6.851	6.655	4.904	0.000
ENE	6.929	5.723	5.402	5.959	5.836	4.986	0.000
NE	6.228	5.155	4.482	4.805	5.283	4.483	0.000
NNE	6.007	5.321	5.255	5.084	4.995	4.050	0.000

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

WEATHER
Page 2

FREQUENCIES OF STABILITY CLASSES (WIND TOWARDS)

Pasquill Stability Class							
Dir	A	B	C	D	E	F	G
N	0.4256	0.0715	0.0578	0.1204	0.1049	0.2199	0.0000
NNW	0.2993	0.0514	0.0426	0.1355	0.2185	0.2527	0.0000
NW	0.1620	0.0313	0.0290	0.1270	0.2871	0.3636	0.0000
WNW	0.0975	0.0230	0.0233	0.1052	0.2076	0.5434	0.0000
W	0.1193	0.0322	0.0329	0.1843	0.2477	0.3837	0.0000
WSW	0.1202	0.0387	0.0428	0.2218	0.2161	0.3605	0.0000
SW	0.1409	0.0380	0.0423	0.2134	0.1509	0.4146	0.0000
SSW	0.1510	0.0439	0.0493	0.2190	0.1402	0.3966	0.0000
S	0.1712	0.0576	0.0584	0.2174	0.1755	0.3199	0.0000
SSE	0.2163	0.0723	0.0651	0.2178	0.1485	0.2799	0.0000
SE	0.2279	0.0903	0.0930	0.1962	0.1356	0.2570	0.0000
ESE	0.2792	0.0861	0.0795	0.1774	0.1385	0.2393	0.0000
E	0.3819	0.0707	0.0652	0.1703	0.1498	0.1621	0.0000
ENE	0.4018	0.0804	0.0695	0.1583	0.1217	0.1682	0.0000
NE	0.4202	0.0949	0.0723	0.1375	0.1025	0.1725	0.0000
NNE	0.4463	0.0917	0.0709	0.1192	0.0850	0.1870	0.0000
TOTAL	0.2332	0.0516	0.0470	0.1537	0.1897	0.3247	0.0000

ADDITIONAL WEATHER INFORMATION

Average Air Temperature: 10.0 degrees C
283.16 K
Precipitation: 100.0 cm/y
Lid Height: 1000 meters
Surface Roughness Length: 0.010 meters
Height of Wind Measurements: 10.0 meters
Average Wind Speed: 5.869 m/s

Vertical Temperature Gradients:

STABILITY E 0.073 k/m
STABILITY F 0.109 k/m
STABILITY G 0.146 k/m

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Individual Assessment
Aug 26, 2002 09:44 am

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 26, 2002 09:44 am
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
-----	-----
GONADS	9.75E-07
BREAST	9.90E-08
R MAR	6.17E-06
LUNGS	6.19E-07
THYROID	9.70E-08
ENDOST	7.60E-05
RMNDR	3.37E-06
EFFEC	4.37E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
-----	-----
INGESTION	3.53E-07
INHALATION	4.01E-06
AIR IMMERSION	4.08E-14
GROUND SURFACE	2.21E-09
INTERNAL	4.37E-06
EXTERNAL	2.21E-09
TOTAL	4.37E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
AM-241	2.11E-06
PU-238	1.13E-06
PU-239	1.12E-06
TOTAL	4.37E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
LEUKEMIA	5.21E-12
BONE	3.36E-12
THYROID	1.15E-14
BREAST	8.73E-14
LUNG	1.75E-12
STOMACH	6.25E-14
BOWEL	3.74E-14
LIVER	1.18E-11
PANCREAS	4.59E-14
URINARY	2.43E-14
OTHER	5.62E-14
TOTAL	2.24E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
INGESTION	1.70E-12
INHALATION	2.07E-11
AIR IMMERSION	8.49E-19
GROUND SURFACE	4.59E-14
INTERNAL	2.24E-11
EXTERNAL	4.59E-14
TOTAL	2.24E-11

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
AM-241	1.08E-11
PU-238	6.02E-12
PU-239	5.63E-12
TOTAL	2.24E-11

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	7,500
-----------	-------

N	1.6E-06
NNW	2.6E-06
NW	4.4E-06
WNW	4.4E-06
W	2.1E-06
WSW	1.3E-06
SW	1.4E-06
SSW	1.4E-06
S	1.1E-06
SSE	9.3E-07
SE	9.0E-07
ESE	8.9E-07
E	9.9E-07
ENE	9.0E-07
NE	8.3E-07
NNE	1.1E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	7,500
-----------	-------

N	8.2E-12
NNW	1.3E-11
NW	2.2E-11
WNW	2.2E-11
W	1.1E-11
WSW	6.8E-12
SW	7.0E-12
SSW	7.0E-12
S	5.9E-12
SSE	4.8E-12
SE	4.6E-12
ESE	4.6E-12
E	5.1E-12
ENE	4.6E-12
NE	4.3E-12
NNE	5.4E-12

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C O N C E N T R A T I O N T A B L E S

Non-Radon Individual Assessment
Aug 26, 2002 09:44 am

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 26, 2002 09:44 am
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

CONCEN
Page 1

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Nuclide	Air Concentration (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition Rate (pCi/cm ² /s)
N	7,500	AM-241	1.6E-10	2.9E-17	1.8E-17	4.7E-17
N	7,500	PU-238	9.9E-11	1.8E-17	1.1E-17	2.9E-17
N	7,500	PU-239	8.8E-11	1.6E-17	9.9E-18	2.6E-17
NNW	7,500	AM-241	2.6E-10	4.7E-17	2.6E-17	7.3E-17
NNW	7,500	PU-238	1.6E-10	2.9E-17	1.6E-17	4.5E-17
NNW	7,500	PU-239	1.4E-10	2.6E-17	1.4E-17	4.0E-17
NW	7,500	AM-241	4.5E-10	8.0E-17	3.6E-17	1.2E-16
NW	7,500	PU-238	2.7E-10	4.9E-17	2.2E-17	7.2E-17
NW	7,500	PU-239	2.4E-10	4.4E-17	2.0E-17	6.3E-17
WNW	7,500	AM-241	4.5E-10	8.0E-17	3.1E-17	1.1E-16
WNW	7,500	PU-238	2.8E-10	5.0E-17	1.9E-17	6.9E-17
WNW	7,500	PU-239	2.4E-10	4.4E-17	1.7E-17	6.1E-17
W	7,500	AM-241	2.2E-10	3.9E-17	1.7E-17	5.6E-17
W	7,500	PU-238	1.3E-10	2.4E-17	1.0E-17	3.4E-17
W	7,500	PU-239	1.2E-10	2.1E-17	9.3E-18	3.0E-17
WSW	7,500	AM-241	1.4E-10	2.4E-17	1.1E-17	3.5E-17
WSW	7,500	PU-238	8.3E-11	1.5E-17	6.7E-18	2.2E-17
WSW	7,500	PU-239	7.4E-11	1.3E-17	6.0E-18	1.9E-17
SW	7,500	AM-241	1.4E-10	2.5E-17	1.1E-17	3.6E-17
SW	7,500	PU-238	8.6E-11	1.5E-17	6.7E-18	2.2E-17
SW	7,500	PU-239	7.6E-11	1.4E-17	5.9E-18	2.0E-17
SSW	7,500	AM-241	1.4E-10	2.5E-17	1.1E-17	3.6E-17
SSW	7,500	PU-238	8.5E-11	1.5E-17	6.9E-18	2.2E-17
SSW	7,500	PU-239	7.5E-11	1.4E-17	6.1E-18	2.0E-17
S	7,500	AM-241	1.2E-10	2.1E-17	1.1E-17	3.2E-17
S	7,500	PU-238	7.2E-11	1.3E-17	6.5E-18	2.0E-17
S	7,500	PU-239	6.4E-11	1.1E-17	5.8E-18	1.7E-17
SSE	7,500	AM-241	9.5E-11	1.7E-17	9.3E-18	2.6E-17
SSE	7,500	PU-238	5.8E-11	1.0E-17	5.7E-18	1.6E-17
SSE	7,500	PU-239	5.2E-11	9.3E-18	5.1E-18	1.4E-17
SE	7,500	AM-241	9.1E-11	1.6E-17	9.6E-18	2.6E-17
SE	7,500	PU-238	5.6E-11	1.0E-17	5.9E-18	1.6E-17
SE	7,500	PU-239	5.0E-11	8.9E-18	5.2E-18	1.4E-17
ESE	7,500	AM-241	9.0E-11	1.6E-17	9.8E-18	2.6E-17
ESE	7,500	PU-238	5.5E-11	1.0E-17	6.1E-18	1.6E-17
ESE	7,500	PU-239	4.9E-11	8.8E-18	5.4E-18	1.4E-17
E	7,500	AM-241	9.9E-11	1.8E-17	1.2E-17	3.0E-17
E	7,500	PU-238	6.1E-11	1.1E-17	7.6E-18	1.9E-17
E	7,500	PU-239	5.4E-11	9.7E-18	6.7E-18	1.6E-17

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

CONCEN
Page 2

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Nuclide	Air Concentration (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition Rate (pCi/cm ² /s)
ENE	7,500	AM-241	9.0E-11	1.6E-17	1.2E-17	2.8E-17
ENE	7,500	PU-238	5.6E-11	1.0E-17	7.4E-18	1.7E-17
ENE	7,500	PU-239	4.9E-11	8.8E-18	6.5E-18	1.5E-17
NE	7,500	AM-241	8.4E-11	1.5E-17	1.1E-17	2.6E-17
NE	7,500	PU-238	5.2E-11	9.3E-18	6.9E-18	1.6E-17
NE	7,500	PU-239	4.6E-11	8.2E-18	6.1E-18	1.4E-17
NNE	7,500	AM-241	1.1E-10	1.9E-17	1.3E-17	3.3E-17
NNE	7,500	PU-238	6.5E-11	1.2E-17	8.3E-18	2.0E-17
NNE	7,500	PU-239	5.8E-11	1.0E-17	7.3E-18	1.8E-17

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK CONVERSION FACTORS

Non-Radon Individual Assessment
Aug 26, 2002 09:44 am

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 26, 2002 09:44 am
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

FACTOR
Page 1

DOSE AND RISK FACTOR UNITS

The units for each type of dose rate conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	millirem/picoCurie
Inhalation	millirem/picoCurie
Immersion	millirem-cubic cm/microCurie-year
Surface	millirem-square cm/microCurie-year

Risks for internal exposures (inhalation and ingestion) are the lifetime risk of premature death in a birth cohort of 100,000 people for a 1 picoCurie/year intake rate, where the average lifetime is 70.7565 years.

This is simplified to lifetime risk per 100,000 picoCuries.

The units for each type of risk conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	lifetime risk/100,000 picoCuries
Inhalation	lifetime risk/100,000 picoCuries
Immersion	lifetime risk-cubic cm/100,000 picoCurie-years
Surface	lifetime risk-square cm/100,000 picoCurie-years

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

FACTOR
Page 2

* NUCLIDE AM-241 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	1.001E-03	1.212E-01	1.151E+08	3.541E+04
BREAST	9.709E-05	1.176E-02	1.469E+08	5.550E+04
R MAR	6.327E-03	7.663E-01	3.737E+07	1.077E+04
LUNGS	9.714E-05	8.047E-02	6.919E+07	2.009E+04
THYROID	9.703E-05	1.175E-02	1.099E+08	3.175E+04
ENDOST	7.801E-02	9.447E+00	1.273E+08	3.693E+04
RMNDR	3.508E-03	4.176E-01	6.778E+07	1.937E+04
EFFEC	4.430E-03	5.428E-01	9.104E+07	2.875E+04

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	9.208E-03	1.110E+00	3.452E+09	1.062E+06
OVARIES	9.232E-03	1.112E+00	1.521E+09	4.384E+05
AVERAGE	9.221E-03	1.111E+00	2.486E+09	7.504E+05

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.337E-04	6.457E-02	1.184E+01	3.410E-03
BONE	3.433E-04	4.152E-02	2.253E+00	6.535E-04
THYROID	1.062E-06	1.283E-04	4.998E+00	1.444E-03
BREAST	7.158E-06	8.639E-04	5.751E+01	2.174E-02
LUNG	9.643E-06	2.284E-02	3.429E+01	9.960E-03
STOMACH	6.586E-06	7.140E-04	1.852E+01	5.317E-03
BOWEL	1.094E-05	3.603E-04	8.526E+00	2.445E-03
LIVER	1.198E-03	1.448E-01	2.179E+01	6.239E-03
PANCREAS	4.480E-06	5.408E-04	9.503E+00	2.760E-03
URINARY	2.298E-06	2.773E-04	8.681E+00	2.479E-03
OTHER	5.479E-06	6.614E-04	1.162E+01	3.376E-03

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.197E-10	3.843E-08	6.464E+02	1.951E-01
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

FACTOR
Page 3

* NUCLIDE PU-238 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	8.603E-04	1.041E-01	4.218E+05	7.548E+02
BREAST	8.419E-05	1.020E-02	1.806E+06	4.070E+03
R MAR	5.485E-03	6.641E-01	5.291E+04	4.514E+01
LUNGS	8.419E-05	7.893E-02	1.177E+05	1.225E+02
THYROID	8.419E-05	1.020E-02	1.709E+05	1.510E+02
ENDOST	6.763E-02	8.189E+00	2.090E+05	2.050E+02
RMNDR	3.085E-03	3.666E-01	8.732E+04	7.659E+01
EFFEC	3.853E-03	4.726E-01	4.344E+05	8.530E+02

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	8.657E-03	1.043E+00	1.265E+07	2.264E+04
OVARIES	8.673E-03	1.045E+00	2.331E+06	2.087E+03
AVERAGE	8.665E-03	1.044E+00	7.492E+06	1.237E+04

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	4.695E-04	5.676E-02	1.676E-02	1.430E-05
BONE	3.046E-04	3.681E-02	3.700E-03	3.628E-06
THYROID	9.438E-07	1.140E-04	7.775E-03	6.866E-06
BREAST	6.493E-06	7.839E-04	7.072E-01	1.594E-03
LUNG	8.684E-06	2.272E-02	5.833E-02	6.072E-05
STOMACH	5.991E-06	6.480E-04	2.550E-02	1.840E-05
BOWEL	1.016E-05	3.272E-04	1.083E-02	6.451E-06
LIVER	1.099E-03	1.327E-01	2.503E-02	9.235E-06
PANCREAS	4.054E-06	4.895E-04	1.656E-02	1.864E-05
URINARY	2.080E-06	2.511E-04	1.007E-02	3.352E-06
OTHER	4.959E-06	5.987E-04	2.026E-02	2.280E-05

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	2.992E-10	3.604E-08	1.948E+00	3.216E-03
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

FACTOR
Page 4

* NUCLIDE PU-239 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	9.741E-04	1.180E-01	4.329E+05	3.463E+02
BREAST	9.453E-05	1.145E-02	9.990E+05	1.617E+03
R MAR	6.166E-03	7.471E-01	1.950E+05	5.587E+01
LUNGS	9.453E-05	7.609E-02	2.420E+05	8.954E+01
THYROID	9.453E-05	1.145E-02	3.385E+05	1.165E+02
ENDOST	7.593E-02	9.199E+00	3.996E+05	1.473E+02
RMNDR	3.399E-03	4.054E-01	2.250E+05	6.734E+01
EFFEC	4.310E-03	5.278E-01	4.002E+05	3.747E+02

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	8.801E-03	1.061E+00	1.299E+07	1.039E+04
OVARIES	8.777E-03	1.058E+00	5.506E+06	1.798E+03
AVERAGE	8.789E-03	1.059E+00	9.246E+06	6.094E+03

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.183E-04	6.271E-02	6.176E-02	1.770E-05
BONE	3.323E-04	4.019E-02	7.072E-03	2.606E-06
THYROID	1.027E-06	1.242E-04	1.540E-02	5.301E-06
BREAST	6.868E-06	8.298E-04	3.913E-01	6.333E-04
LUNG	9.263E-06	2.149E-02	1.200E-01	4.439E-05
STOMACH	6.254E-06	6.858E-04	6.736E-02	1.961E-05
BOWEL	9.813E-06	3.457E-04	3.275E-02	8.719E-06
LIVER	1.148E-03	1.387E-01	7.186E-02	1.699E-05
PANCREAS	4.289E-06	5.181E-04	4.236E-02	1.502E-05
URINARY	2.200E-06	2.658E-04	2.614E-02	6.081E-06
OTHER	5.246E-06	6.337E-04	5.181E-02	1.838E-05

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.034E-10	3.656E-08	2.404E+00	1.584E-03
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C H I / Q T A B L E S

Non-Radon Individual Assessment
Aug 26, 2002 09:44 am

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2001

Comments: This is the 2001 WIPP BECR Report.

Dataset Name: 02BECRa
Dataset Date: Aug 26, 2002 09:44 am
Wind File: C:\CAP88PC2\WINDFILES\96-2001.WND

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Aug 26, 2002 09:44 am

CHI/Q
Page 1

GROUND-LEVEL CHI/Q VALUES FOR AM-241
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	7,500
N	5.603E-08
NNW	9.090E-08
NW	1.550E-07
WNW	1.553E-07
W	7.496E-08
WSW	4.702E-08
SW	4.856E-08
SSW	4.817E-08
S	4.067E-08
SSE	3.290E-08
SE	3.172E-08
ESE	3.120E-08
E	3.458E-08
ENE	3.136E-08
NE	2.914E-08
NNE	3.690E-08

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

CHI/Q
Page 2

GROUND-LEVEL CHI/Q VALUES FOR PU-238
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	7,500
N	5.602E-08
NNW	9.086E-08
NW	1.549E-07
WNW	1.552E-07
W	7.491E-08
WSW	4.700E-08
SW	4.854E-08
SSW	4.815E-08
S	4.066E-08
SSE	3.289E-08
SE	3.171E-08
ESE	3.119E-08
E	3.457E-08
ENE	3.135E-08
NE	2.913E-08
NNE	3.690E-08

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Aug 26, 2002 09:44 am

CHI/Q
Page 3

GROUND-LEVEL CHI/Q VALUES FOR PU-239
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	7,500
N	5.607E-08
NNW	9.103E-08
NW	1.553E-07
WNW	1.556E-07
W	7.509E-08
WSW	4.711E-08
SW	4.863E-08
SSW	4.823E-08
S	4.071E-08
SSE	3.294E-08
SE	3.175E-08
ESE	3.123E-08
E	3.463E-08
ENE	3.140E-08
NE	2.917E-08
NNE	3.692E-08

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CY 2000 REPORT SUMMARY

This report satisfies the reporting requirements established by 40 CFR Part 191, Subpart A, "Environmental Management and Storage." The CAP88-PC dose assessment computer model was used to estimate the doses(s) reported in this report. Copies of the output data from CAP88-PC are attached.

Year of Reporting Period: 2000

Compliance

Calculations made using the above-referenced code indicate that the effective dose equivalent (EDE) to the maximally exposed individual resulting from normal operations conducted at this facility is less than **9.07E-05** millirem (mrem) per year whole-body and **1.58E-03** mrem per year to the critical organ. These values are in compliance with the requirements of 40 CFR Part 191, Subpart A of 25 mrem whole-body and 75 mrem to any critical organ.

SUMMARY OF SOURCE TERM AND CALCULATED EFFECTIVE DOSE EQUIVALENTS

Table 2 – Summary of Radionuclide Effluents from Underground Storage Areas

Station	Radionuclide	Activity Released (Ci/YR)	Particle Size (um)*	Class (D, W, Y)+
A	²³⁸ Pu	4.6x10 ⁻⁰⁸	1	W
A	^{239/240} Pu	6.4x10 ⁻⁰⁸	1	W
A	²⁴¹ Am	6.6x10 ⁻⁰⁸	1	W
B	²³⁸ Pu	2.7x10 ⁻⁰⁹	1	W
B	^{239/240} Pu	2.0x10 ⁻⁰⁹	1	W
B	²⁴¹ Am	3.2x10 ⁻⁰⁹	1	W
C	²³⁸ Pu	7.5x10 ⁻⁰⁹	1	W
C	^{239/240} Pu	5.0x10 ⁻⁰⁹	1	W
C	²⁴¹ Am	8.2x10 ⁻⁰⁹	1	W

* Default values from CAP88-PC

+ Assumed to yield upper bound dose estimates

FACILITY NAME AND LOCATION

Facility: Waste Isolation Pilot Plant
 Facility Location: 26 Miles SE of Carlsbad, New Mexico, 88220

RADIOACTIVE MATERIALS USED

The waste managed at the WIPP contains transuranic (TRU) radionuclides. The TRU radionuclides with the highest potential to deliver a dose to an off-site receptor are ^{238}Pu , ^{239}Pu , ^{240}Pu , and ^{241}Am . Operations at the WIPP facility do not involve handling any loose radioactive material. All waste containers are sealed at the waste-generating facilities and remain sealed during the disposal operation. Removable contamination on the exterior surfaces of containers is restricted to minimal levels in accordance with DOE/WIPP-069, Waste Acceptance Criteria, and should not present a significant source of radionuclide release in airborne effluents. During normal operating conditions, there is essentially no potential for airborne emissions of radionuclides contained in the TRU waste managed at the WIPP facility.

Small quantities (i.e., activities) of radioactive materials (mostly sealed sources) are used at the WIPP facility to calibrate and verify the operation of various radiation detection instrumentation. However, this source of radioactive materials does not have the potential to result in measurable off-site dose consequences.

DESCRIPTION OF OPERATIONS

The WIPP facility is a TRU radioactive waste disposal facility owned by the U.S. Department of Energy (DOE) and operated by the Westinghouse TRU Solutions LLC of Westinghouse Government Environmental Services Company. The principal operation of the WIPP facility involves the receipt of contact and planned receipt of remote handled TRU and TRU mixed waste and emplacement in the underground repository for disposal. Only waste that conforms with DOE/WIPP-069, Waste Acceptance Criteria, is accepted for placement in the WIPP facility. Administrative controls prohibit the waste containers from being opened once they are accepted at WIPP.

EMISSION POINTS

The WIPP facility has three emission points, Stations A, B, and C, that may release airborne radionuclides to the environment. Station A exhausts unfiltered air from the underground repository to the atmosphere. Station B exhausts high-efficiency particulate air (HEPA) filtered air from the underground repository to the atmosphere when in Filtration Mode of operation. When in Filtration Mode, Stations A and B are mutually exclusive (i.e., when air is exhausted from one Station, none is exhausted from the other Station). Stations A and B sample the same air when operated in the Maintenance Bypass, Reduced, or Minimum Mode. Station C exhausts HEPA-filtered air from the Waste Handling Building (WHB) to the atmosphere.

EFFLUENT CONTROLS

Radionuclide emissions from waste containers are controlled by carbon composite filter vents that must be fitted to all waste containers accepted at the WIPP facility. Each filter must exhibit filtering efficiencies of greater than 99 percent with 0.3 to 0.5-micron particles of dioctyl- phthalate (DOP) smoke (DOE 1989).

Waste Isolation Pilot Plant Biennial Environmental Compliance Report DOE/WIPP 02-2171

Air monitors are maintained at strategic locations in the WHB and in the underground repository to monitor the real-time levels of airborne radioactivity. Readouts from the underground air monitors are displayed in the Central Monitoring Room (CMR), a continuously occupied location from which WIPP facility operations are monitored. During normal conditions, the underground repository effluent does not pass through HEPA filtration units before being discharged to the environment through Station A. The WHB effluent, generated by aboveground waste handling operations, is subject to continuous HEPA filtration before being discharged to the environment through Station C. Stations B and C HEPA filtration units are DOP tested annually and exhibit filtering efficiencies greater than 99 percent (DOE 1995).

The WHB ventilation system maintains a negative pressure differential between the outside environment and the waste handling environment. This provides a secondary confinement barrier against the release of radionuclides to the environment. The waste containers themselves are considered the primary barrier. A negative pressure differential ensures that any leaks in the WHB structure will result in an in-leakage of outside air, which precludes the release of airborne contamination inside the WHB to the environment.

The underground ventilation system is composed of four subsystems with a common air supply. This dividing of the air supply inhibits the spread of contamination in the unlikely event radioactive material becomes airborne. Separation of the subsystem air flows is maintained by the use of air locks until the flows are recombined at the exhaust shaft. A pressure differential is maintained between the subsystems to ensure that any air leakage flows from the non-nuclear areas (least contamination potential) to the radioactive materials areas (highest contamination potential).

The WIPP facility uses skid-mounted fixed air samplers (FASs) at each emission point to collect representative samples of airborne particulates. Each emission point FAS has two independent vacuum pumps; one vacuum pump supplies the vacuum and the other functions as a backup. In the event of an external power failure, an uninterruptible power supply provides sufficient power to all FASs for approximately 30 minutes. Diesel generators are available to supply electrical power should the electrical outage last longer than 30 minutes.

Approved and controlled operating procedures are used at the WIPP facility to ensure that uniform methods are used to collect, package, and transport FAS filters. The use of such procedures provides a means for demonstrating quality assurance of air emission data. Station A FAS filters are collected as needed each working shift, to assure a representative sample. Station B FAS filters are collected weekly and at the end of each underground effluent filtration event. Station C FAS filters are collected weekly. Filters from all three stations are typically analyzed for ^{238}Pu , ^{239}Pu , ^{240}Pu , and ^{241}Am . These four radionuclides account for approximately 98 percent of the potential dose (EDE) resulting from the WIPP facility air emissions (DOE/WIPP 95-2065, Safety Analysis Report). The 98 percent is based upon the transuranic inventory expected at WIPP.

DISTANCES TO NEAREST RECEPTORS FROM RELEASE POINTS

The WIPP facility is located in a low population density area that has fewer than 30 permanent residents living within a 10-mile radius (WIPP SAR). The area surrounding the WIPP facility is used primarily for grazing and development of potash, oil, and gas resources. All land within the WIPP site boundary up to the "Exclusive Use Area" in the northwest sector is leased for grazing, which is the only significant agricultural activity in the vicinity of the WIPP facility. Development of the natural resources results in a transient (nonpermanent) population consisting primarily of workers at three potash mines and numerous oil and gas wells located within 10 miles of the WIPP facility.

In compliance with 40 CFR Part 191, Subpart A, the location of the maximally exposed individual is the location where an actual individual lives or works who receives the maximum annual radiation dose from the source. *The Guidance for the Implementation of EPA's Standards for Management and Storage of Transuranic Waste (40 CFR Part 191, Subpart A) at the Waste Isolation Pilot Plant (EPA 402-R-97-001)*, states, "The U.S. Environmental Protection Agency expects the DOE to examine radiation doses to individuals at any off-site point where there is a residence, school, business, or office. At the WIPP, consideration of business should include activities such as grazing, mining, or oil drilling in the vicinity of the site." Based on the above referenced EPA guidance document and WIPP's meteorological condition (i.e., the prevailing wind direction), the receptor selected is an individual at the WIPP fence line located 350 meters in the NW sector. This receptor has been selected as the location for the maximally exposed individual. The complete set of dose and risk factors used in CAP88-PC to calculate the effective dose equivalent of less than 9.07E-05 millirem per year to the maximally exposed individual is provided in the attached CAP88-PC output data report.

The Guidance for the Implementation of EPA's Standards for Management and Storage of Transuranic Waste (40 CFR Part 191, Subpart A) at the Waste Isolation Pilot Plant (EPA 402-R-97-001), further states

In implementing Subpart A at the WIPP, EPA expects DOE to analyze potential exposure pathways and then examine demographic information and conduct field investigations to identify the locations of actual individuals who could be exposed via those pathways. As a conservative simplifying assumption, DOE could conduct separate analyses of potential doses received from each exposure pathway, then assume that a member of the public resides at the single geographic point on the surface where the maximum dose would be received. This dose can be calculated by summing the dose from all pathways to calculate the maximum dose to a member of the public at the single geographic point.

Based on the above referenced EPA guidance document, demographic information, and WIPP's meteorological condition (i.e., the prevailing wind direction), the receptor selected is an individual at the Smith Ranch located 7,500 meters in the WNW sector.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

This receptor has been selected as the location for the maximally exposed individual. The complete set of dose and risk factors used in CAP88-PC to calculate the effective dose equivalent of less than 5.20E-06 millirem per year to the maximally exposed individual at the Smith Ranch is provided in the attached CAP88-PC output data report.

Input Data for CAP88-PC Dose Assessment Computer Model

Meteorological Data File: 96-99.wnd (met data for the WIPP site 1996-1999)
 Population Data File: WIPP99.pop (population data for WIPP region)
 Annual precipitation: 30 cm/yr (five-year average, 1996 to 2000)
 Annual ambient temperature: 17°C (five-year average, 1996 to 2000)
 Lid height: 1000 m
 Agricultural Scenario: Local

Table 1 - Characteristics of WIPP's Emission Points

Characteristics	Station A	Station B	Station C
Effective Station Height (m)	7.7	6.7	20.0
Effective Station Diameter (m)	5.2	1.8	2.6
Station Area (m ²)	21.2	2.6	6.8
Flow Rate (ft ³ /min)	4.25 x 10 ⁵	6.0 x 10 ⁴	4.7 x 10 ⁴
Flow Rate (m ³ /min)	1.2 x 10 ⁴	1699	1331
Exit Velocity (m/sec)	9.4	10.8	3.3
Effective Exit Velocity (m/sec)	6.7	NA	NA
Orientation	45° angle	vertical	vertical
Shape	rectangle	round	rectangle
HEPA filtered	no	yes	yes

CONSTRUCTION AND MODIFICATIONS COMPLETED DURING CY 2000 REPORTING PERIOD

No construction or modifications were undertaken on the Sampling Stations A, B, or C during this period.

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Table 2 – Summary of Radionuclide Effluents from Underground Storage Areas and Waste Handling Building

Station	Radionuclide	Activity Released (Ci/YR)	Particle Size (um)*	Class (D, W, Y)+
A	²³⁸ Pu	4.6x10 ⁻⁰⁸	1	w
A	^{239/240} Pu	6.4x10 ⁻⁰⁸	1	w
A	²⁴¹ Am	6.6x10 ⁻⁰⁸	1	w
B	²³⁸ Pu	2.7x10 ⁻⁰⁹	1	w
B	^{239/240} Pu	2.0x10 ⁻⁰⁹	1	w
B	²⁴¹ Am	3.2x10 ⁻⁰⁹	1	w
C	²³⁸ Pu	7.5x10 ⁻⁰⁹	1	w
C	^{239/240} Pu	5.0x10 ⁻⁰⁹	1	w
C	²⁴¹ Am	8.2x10 ⁻⁰⁹	1	w

* Default values from CAP88-PC

+ Assumed to yield upper bound dose estimates

MONITORING RESULTS

The monitoring activities at WIPP involve two individual programs. The primary program is used to detect for the presence of radionuclides within the exclusive use area. The secondary program provides a method to determine if any radioactive material has extended beyond the boundary of the facility. These programs are known as radiological monitoring and environmental monitoring, respectively.

The environmental monitoring involves sampling the air soil, surface water, groundwater, and biological life throughout the area surrounding the WIPP site. A summary of the annual laboratory data from the environmental sampling activities for the calendar year 2000 is presented in Table 3. A baseline inventory of the background radioactivity for these two calendar years can be found in the WIPP Site Environmental Report, which is produced annually.

It is not possible to directly compare the estimated activity release calculated for 40 CFR Part 191, Subpart A, to the measurements of radionuclide concentration made by Environmental Monitoring. The estimated releases are calculated assuming that a sample that did not contain radionuclides at the minimum detectable activity level. Consequently, the estimated release is conservatively high. The estimated releases are reported in Curies/year (Ci/Yr). For environmental monitoring, airborne concentrations are explicitly measured and reported in becquerels per cubic meter (Bq/m³).

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

OATH AND SIGNATURE

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment (see 18 U.S.C. §1001).

Signed: _____

Date: _____

Title: _____

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Table 3 – 2000 Annual Summary of Environmental Monitoring Activities

Sample Matrix	No. of Samples	Gross Alpha		Gross Beta		²⁴¹ Am		²³⁸ Pu	
		Mean	2SD	Mean	2SD	Mean	2SD	Mean	2SD
Air (Bq/m ³)	416	8.99E-05	5.25E-06	9.33E-04	2.70E-05	3.65E-08	1.37E-08	1.25E-09	6.28E-08
Soil (0-2 cm) (Bq/g dry)	6	N/A	N/A	N/A	N/A	1.60E-04	2.41E-04	-8.42E-06	2.71E-04
Soil (2-5 cm) (Bq/g dry)	6	N/A	N/A	N/A	N/A	1.48E-04	3.24E-04	-3.02E-06	1.76E-04
Soil (5-10 cm) (Bq/g dry)	6	N/A	N/A	N/A	N/A	2.10E-04	4.51E-04	-4.82E-05	1.23E-04
Surface water (Bq/l)	19	N/A	N/A	N/A	N/A	1.98E-04	3.24E-04	8.32E-05	3.89E-04
Groundwater (Bq/l)	14	N/A	N/A	N/A	N/A	1.76E-04	2.14E-04	2.29E-05	2.05E-04
Sediments (Bq/g dry)	13	N/A	N/A	N/A	N/A	2.22E-04	3.22E-04	9.79E-05	4.42E-04
Vegetation (Bq/g wet)	6	N/A	N/A	N/A	N/A	1.71E-05	1.42E-05	-6.33E-07	2.19E-05
Beef	0								
Deer (Bq/g wet)	2	N/A	N/A	N/A	N/A	-7.45E-07	1.84E-05	4.01E-06	1.12E-05
Quail (Bq/g wet)	1	N/A	N/A	N/A	N/A	3.70E-05	7.79E-05	2.60E-05	5.39E-05
Rabbit	0	N/A	N/A	N/A	N/A				
Fish (Bq/g wet)	4	N/A	N/A	N/A	N/A	2.96E-05	8.44E-06	3.66E-05	1.43E-04

Sample Matrix	No. of Samples	²³⁹⁺²⁴⁰ Pu		²³³⁺²³⁴ U		²³⁵ U		²³⁸ U	
		Mean	2SD	Mean	2SD	Mean	2SD	Mean	2SD
Air (Bq/m ³)	416	2.36E-08	1.18E-08	2.24E-06	7.32E-08	1.03E-07	2.23E-08	2.18E-06	7.13E-08
Soil (0-2 cm) (Bq/g dry)	6	1.26E-04	2.59E-04	1.13E-02	1.02E-02	3.36E-04	6.64E-04	1.27E-02	1.23E-02
Soil (2-5 cm) (Bq/g dry)	6	2.13E-04	5.24E-04	1.20E-02	8.58E-03	7.96E-04	1.13E-03	1.26E-02	8.59E-03
Soil (5-10 cm) (Bq/g dry)	6	2.88E-04	2.32E-04	1.24E-02	7.39E-03	7.70E-04	7.85E-04	1.29E-02	7.81E-03
Surface water (Bq/l)	19	1.43E-04	5.61E-04	4.46E-02	1.13E-01	1.65E-03	3.08E-03	2.66E-02	4.95E-02
Groundwater (Bq/l)	14	1.33E-04	2.98E-04	3.52E-01	4.35E-01	3.44E-03	3.37E-03	6.31E-02	7.02E-02
Sediments (Bq/g dry)	13	3.44E-04	3.49E-04	2.35E-02	1.91E-02	1.80E-03	2.53E-03	2.10E-02	1.82E-02
Vegetation (Bq/g wet)	6	2.44E-05	6.15E-05	1.28E-03	1.59E-03	5.66E-05	7.77E-05	1.23E-03	1.36E-03
Beef	0								
Deer (Bq/g wet)	2	8.75E-06	1.40E-05	3.42E-05	2.60E-05	2.79E-05	2.71E-05	2.12E-05	2.25E-05
Quail (Bq/g wet)	1	1.15E-05	4.54E-05	3.58E-04	2.39E-04	3.70E-04	2.91E-04	1.92E-04	1.98E-04
Rabbit	0								
Fish (Bq/g wet)	4	1.28E-05	3.23E-05	1.09E-04	1.23E-04	-3.85E-07	2.27E-05	8.08E-05	1.16E-04

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Table 3 – 2000 Annual Summary of Environmental Monitoring Activities

Sample Matrix	No. of Samples	⁹⁰ Sr		⁶⁰ Co		¹³⁷ Cs		⁴⁰ K	
		Mean	2SD	Mean	2SD	Mean	2SD	Mean	2SD
Air (Bq/m ³)	416	1.54E-06	8.09E-07	5.08E-07	4.36E-06	1.37E-06	2.18E-06	1.71E-03	1.86E-04
Soil (0-2 cm) (Bq/g dry)	6	1.40E-02	5.33E-03	2.98E-04	6.45E-03	5.45E-03	8.90E-03	3.58E-01	4.85E-01
Soil (2-5 cm) (Bq/g dry)	6	6.12E-03	2.34E-02	2.08E-03	2.72E-03	3.01E-03	1.06E-02	3.37E-01	3.56E-01
Soil (5-10 cm) (Bq/g dry)	6	1.50E-02	2.12E-02	1.27E-03	6.81E-03	5.31E-03	5.72E-03	2.76E-01	2.60E-01
Surface water (Bq/l)	19	5.94E-03	1.53E-02	1.17E-02	7.20E-01	1.74E-01	8.55E-01	1.93E+02	2.54E+02
Groundwater (Bq/l)	14	-5.55E-04	7.84E-03	5.54E-02	4.70E-01	3.83E-01	3.94E-01	1.72E+02	1.37E+02
Sediments (Bq/g dry)	13	3.90E-03	1.30E-02	-1.40E-04	1.08E-02	6.18E-03	1.21E-02	6.36E-01	4.93E-01
Vegetation (Bq/g wet)	6	5.50E-03	8.85E-03	6.57E-04	1.58E-02	-1.16E-02	9.00E-02	1.34E+00	6.04E-01
Beef	0								
Deer (Bq/g wet)	2	0.00E+00	9.96E-04	5.95E-04	1.21E-03	5.91E-04	1.15E-03	1.49E-01	9.87E-03
Quail (Bq/g wet)	1	5.55E-04	2.48E-03	-4.51E-03	3.31E-03	1.19E-03	2.72E-03	8.34E-02	1.82E-02
Rabbit	0								
Fish (Bq/g wet)	4	4.81E-04	1.41E-03	1.50E-03	2.48E-03	2.25E-03	6.02E-03	3.20E-01	2.35E-01

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

2000 Report Summary Output Data from CAP88-PC

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Apr 3, 2002 02:21 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Effective Dose Equivalent
(mrem/year)

9.07E-05

At This Location: 350 Meters Northwest
Dataset Name: 2000b191
Dataset Date: Apr 3, 2002 02:18 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

SYNOPSIS
Page 1

MAXIMALLY EXPOSED INDIVIDUAL

Location of the Individual: 350 Meters Northwest
Lifetime Fatal Cancer Risk: 4.65E-10

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	2.03E-05
BREAST	2.03E-06
R MAR	1.28E-04
LUNGS	1.30E-05
THYROID	2.00E-06
ENDOST	1.58E-03
RMNDR	7.00E-05
EFPEC	9.07E-05

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

SYNOPSIS
Page 2

RADIONUCLIDE EMISSIONS DURING THE YEAR 2000

Nuclide	Class	Size	Source #1 Ci/y	Source #2 Ci/y	Source #3 Ci/y	TOTAL Ci/y
PU-238	W	1.00	4.6E-08	2.7E-09	7.5E-09	5.6E-08
PU-239	W	1.00	6.4E-08	2.0E-09	7.1E-09	7.3E-08
AM-241	W	1.00	6.6E-08	3.2E-09	8.2E-09	7.7E-08

SITE INFORMATION

Temperature: 17 degrees C
Precipitation: 30 cm/y
Mixing Height: 1000 m

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

SYNOPSIS
Page 3

SOURCE INFORMATION

Source Number:	1	2	3
	-----	-----	-----
Stack Height (m):	8	7	20
Diameter (m):	5	2	3
Plume Rise			
Momentum (m/s): (Exit Velocity)	7	11	3

AGRICULTURAL DATA

	Vegetable	Milk	Meat
	-----	-----	-----
Fraction Home Produced:	1.000	1.000	1.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES (M) USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

350

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

G E N E R A L D A T A

Non-Radon Individual Assessment
Apr 3, 2002 02:21 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Dataset Name: 2000b191
Dataset Date: Apr 3, 2002 02:18 pm
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Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

GENERAL
Page 1

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Scavenging Coefficient (per second)	Dry Deposition Velocity (m/s)
PU-238	W	1.0	3.00E-06	1.80E-03
PU-239	W	1.0	3.00E-06	1.80E-03
AM-241	W	1.0	3.00E-06	1.80E-03

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

GENERAL
Page 2

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	DECAY CONSTANT (PER DAY)		TRANSFER COEFFICIENT		
	Radioactive ⁽¹⁾	Surface	Water	Milk ⁽²⁾	Meat ⁽³⁾
PU-238	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
PU-239	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
AM-241	0.00E+00	5.48E-05	0.00E+00	4.00E-07	3.50E-06

- FOOTNOTES:
- (1) Effective radioactive decay constant in plume; set to zero if less than 1.0E-2
 - (2) Fraction of animal's daily intake of nuclide which appears in each L of milk (days/l)
 - (3) Fraction of animal's daily intake of nuclide which appears in each kg of meat (days/kg)
-

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

GENERAL
Page 3

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	CONCENTRATION UPTAKE FACTOR		GI UPTAKE FRACTION	
	Forage ⁽¹⁾	Edible ⁽²⁾	Inhalation	Ingestion
PU-238	4.50E-04	1.93E-05	1.00E-03	1.00E-03
PU-239	4.50E-04	1.93E-05	1.00E-04	1.00E-03
AM-241	5.50E-03	1.07E-04	1.00E-03	1.00E-03

FOOTNOTES: (1) Concentration factor for uptake of nuclide from soil for pasture and forage (in pCi/kg dry weight per pCi/kg dry soil)

(2) Concentration factor for uptake of nuclide from soil by edible parts of crops (in pCi/kg wet weight per pCi/kg dry soil)

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

GENERAL
Page 4

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE	
Cubic centimeters/hr	9.17E+05
SOIL PARAMETERS	
Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
BUILDUP TIMES	
For activity in soil (years)	1.00E+02
For radionuclides deposited on ground/water (days)	3.65E+04
DELAY TIMES	
Ingestion of pasture grass by animals (hr)	0.00E+00
Ingestion of stored feed by animals (hr)	2.16E+03
Ingestion of leafy vegetables by man (hr)	3.36E+02
Ingestion of produce by man (hr)	3.36E+02
Transport time from animal feed-milk-man (day)	2.00E+00
Time from slaughter to consumption (day)	2.00E+01
WEATHERING	
Removal rate constant for physical loss (per hr)	2.90E-03
CROP EXPOSURE DURATION	
Pasture grass (hr)	7.20E+02
Crops/leafy vegetables (hr)	1.44E+03
AGRICULTURAL PRODUCTIVITY	
Grass-cow-milk-man pathway (kg/sq m)	2.80E-01
Produce/leafy veg for human consumption (kg/sq m)	7.16E-01
FALLOUT INTERCEPTION FRACTIONS	
Vegetables	2.00E-01
Pasture	5.70E-01
GRAZING PARAMETERS	
Fraction of year animals graze on pasture	4.00E-01
Fraction of daily feed that is pasture grass when animal grazes on pasture	4.30E-01

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

GENERAL
Page 5

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

ANIMAL FEED CONSUMPTION FACTORS

Contaminated feed/forage (kg/day, dry weight) 1.56E+01

DAIRY PRODUCTIVITY

Milk production of cow (L/day) 1.10E+01

MEAT ANIMAL SLAUGHTER PARAMETERS

Muscle mass of animal at slaughter (kg) 2.00E+02

Fraction of herd slaughtered (per day) 3.81E-03

DECONTAMINATION

Fraction of radioactivity retained after washing
for leafy vegetables and produce 5.00E-01

FRACTIONS GROWN IN GARDEN OF INTEREST

Produce ingested 1.00E+00

Leafy vegetables ingested 1.00E+00

INGESTION RATIOS:

IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA

Vegetables 1.00E+00

Meat 1.00E+00

Milk 1.00E+00

MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA

(Minimum fractions of food types from outside
area listed below are actual fixed values.)

Vegetables 0.00E+00

Meat 0.00E+00

Milk 0.00E+00

HUMAN FOOD UTILIZATION FACTORS

Produce ingestion (kg/y) 1.76E+02

Milk ingestion (L/y) 1.12E+02

Meat ingestion (kg/y) 8.50E+01

Leafy vegetable ingestion (kg/y) 1.80E+01

SWIMMING PARAMETERS

Fraction of time spent swimming 0.00E+00

Dilution factor for water (cm) 1.00E+00

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

W E A T H E R D A T A

Non-Radon Individual Assessment
Apr 3, 2002 02:21 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Dataset Name: 2000b191
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

WEATHER
Page 1

HARMONIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class

Dir	A	B	C	D	E	F	G	Wind Freq
N	4.316	3.287	2.956	2.406	1.861	1.673	0.000	0.065
NNW	4.678	3.731	3.211	3.161	3.516	2.173	0.000	0.102
NW	4.702	3.763	3.472	3.928	4.246	2.813	0.000	0.162
WNW	4.365	3.707	3.448	3.428	3.790	3.166	0.000	0.142
W	4.490	3.680	3.132	3.718	3.432	2.539	0.000	0.074
WSW	4.374	3.449	3.466	3.733	3.465	2.200	0.000	0.045
SW	4.627	3.720	3.078	3.497	2.609	2.087	0.000	0.041
SSW	4.721	3.339	3.187	3.470	2.482	2.080	0.000	0.042
S	4.775	3.691	3.381	3.197	2.867	2.115	0.000	0.041
SSE	4.836	3.418	2.886	2.686	2.027	2.093	0.000	0.036
SE	4.289	3.306	2.614	2.097	2.529	1.709	0.000	0.033
ESE	4.031	2.793	2.376	1.864	2.207	1.737	0.000	0.033
E	5.485	3.338	2.777	2.521	3.483	2.097	0.000	0.054
ENE	4.690	2.966	2.700	2.247	2.937	2.120	0.000	0.048
NE	4.160	2.780	2.366	1.762	2.116	1.696	0.000	0.037
NNE	4.062	2.997	2.541	2.030	2.072	1.548	0.000	0.045

ARITHMETIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class

Dir	A	B	C	D	E	F	G
N	4.838	3.860	3.710	3.611	2.996	2.433	0.000
NNW	5.292	4.449	4.129	4.709	4.858	2.998	0.000
NW	5.366	4.460	4.444	5.514	5.410	3.574	0.000
WNW	4.915	4.409	4.249	4.871	5.008	3.921	0.000
W	5.255	4.337	4.276	5.534	5.176	3.740	0.000
WSW	5.230	4.496	4.532	5.878	5.119	3.221	0.000
SW	5.636	4.642	4.515	5.550	4.448	2.944	0.000
SSW	5.536	4.247	4.289	5.238	3.817	3.016	0.000
S	5.613	4.430	4.567	4.749	4.265	3.161	0.000
SSE	5.885	4.300	3.667	4.485	3.532	3.270	0.000
SE	4.968	3.927	3.526	3.644	4.203	2.832	0.000
ESE	4.831	3.371	3.247	3.745	3.902	2.869	0.000
E	7.011	5.066	4.827	5.533	5.517	3.479	0.000
ENE	5.812	4.244	4.082	4.305	4.550	3.319	0.000
NE	5.173	3.558	3.285	3.231	3.477	2.651	0.000
NNE	4.695	3.535	3.223	3.279	3.312	2.329	0.000

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

WEATHER
Page 2

FREQUENCIES OF STABILITY CLASSES (WIND TOWARDS)

Pasquill Stability Class							
Dir	A	B	C	D	E	F	G
N	0.4054	0.0755	0.0587	0.1246	0.1117	0.2241	0.0000
NNW	0.2905	0.0542	0.0464	0.1514	0.2004	0.2571	0.0000
NW	0.1586	0.0329	0.0305	0.1327	0.2805	0.3648	0.0000
WNW	0.0923	0.0241	0.0247	0.1107	0.2048	0.5434	0.0000
W	0.1172	0.0356	0.0355	0.1908	0.2368	0.3841	0.0000
WSW	0.1232	0.0350	0.0449	0.2430	0.2060	0.3480	0.0000
SW	0.1321	0.0361	0.0421	0.2354	0.1389	0.4154	0.0000
SSW	0.1417	0.0428	0.0490	0.2459	0.1306	0.3900	0.0000
S	0.1824	0.0547	0.0535	0.2204	0.1910	0.2980	0.0000
SSE	0.2230	0.0678	0.0568	0.2221	0.1631	0.2672	0.0000
SE	0.2240	0.0923	0.0930	0.2069	0.1481	0.2356	0.0000
ESE	0.2814	0.0879	0.0784	0.1877	0.1323	0.2324	0.0000
E	0.3832	0.0690	0.0683	0.1695	0.1526	0.1574	0.0000
ENE	0.4052	0.0835	0.0743	0.1602	0.1175	0.1593	0.0000
NE	0.4123	0.0933	0.0799	0.1439	0.1045	0.1660	0.0000
NNE	0.4284	0.0968	0.0704	0.1217	0.0919	0.1909	0.0000
TOTAL	0.2272	0.0528	0.0487	0.1635	0.1851	0.3228	0.0000

ADDITIONAL WEATHER INFORMATION

Average Air Temperature: 17.0 degrees C
290.16 K
Precipitation: 30.0 cm/y
Lid Height: 1000 meters
Surface Roughness Length: 0.010 meters
Height of Wind Measurements: 10.0 meters
Average Wind Speed: 4.411 m/s

Vertical Temperature Gradients:

STABILITY E 0.073 k/m
STABILITY F 0.109 k/m
STABILITY G 0.146 k/m

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Individual Assessment
Apr 3, 2002 02:21 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
-----	-----
GONADS	2.03E-05
BREAST	2.03E-06
R MAR	1.28E-04
LUNGS	1.30E-05
THYROID	2.00E-06
ENDOST	1.58E-03
RMNDR	7.00E-05
EFFEC	9.07E-05

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
-----	-----
INGESTION	6.04E-06
INHALATION	8.47E-05
AIR IMMERSION	7.01E-13
GROUND SURFACE	3.09E-08
INTERNAL	9.07E-05
EXTERNAL	3.09E-08
TOTAL	9.08E-05

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
-----	-----
PU-238	2.24E-05
PU-239	3.26E-05
AM-241	3.57E-05
TOTAL	9.08E-05

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
LEUKEMIA	1.08E-10
BONE	6.97E-11
THYROID	2.31E-13
BREAST	1.70E-12
LUNG	3.67E-11
STOMACH	1.27E-12
BOWEL	7.38E-13
LIVER	2.44E-10
PANCREAS	9.38E-13
URINARY	4.92E-13
OTHER	1.15E-12
TOTAL	4.65E-10

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
INGESTION	2.91E-11
INHALATION	4.35E-10
AIR IMMERSION	1.46E-17
GROUND SURFACE	6.44E-13
INTERNAL	4.65E-10
EXTERNAL	6.44E-13
TOTAL	4.65E-10

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
-----	-----
PU-238	1.19E-10
PU-239	1.64E-10
AM-241	1.82E-10
TOTAL	4.65E-10

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)	
Direction	350
N	4.0E-05
NNW	6.7E-05
NW	9.1E-05
WNW	6.1E-05
W	4.8E-05
WSW	3.2E-05
SW	2.7E-05
SSW	2.7E-05
S	2.9E-05
SSE	2.7E-05
SE	2.8E-05
ESE	2.9E-05
E	4.8E-05
ENE	4.0E-05
NE	3.0E-05
NNE	3.2E-05

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	350
N	2.1E-10
NNW	3.4E-10
NW	4.7E-10
WNW	3.1E-10
W	2.4E-10
WSW	1.6E-10
SW	1.4E-10
SSW	1.4E-10
S	1.5E-10
SSE	1.4E-10
SE	1.4E-10
ESE	1.5E-10
E	2.4E-10
ENE	2.1E-10
NE	1.5E-10
NNE	1.6E-10

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK CONVERSION FACTORS

Non-Radon Individual Assessment
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FACTOR
Page 1

DOSE AND RISK FACTOR UNITS

The units for each type of dose rate conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	millirem/picoCurie
Inhalation	millirem/picoCurie
Immersion	millirem-cubic cm/microcurie-year
Surface	millirem-square cm/microcurie-year

Risks for internal exposures (inhalation and ingestion) are the lifetime risk of premature death in a birth cohort of 100,000 people for a 1 picoCurie/year intake rate, where the average lifetime is 70.7565 years.

This is simplified to lifetime risk per 100,000 picoCuries.

The units for each type of risk conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	lifetime risk/100,000 picoCuries
Inhalation	lifetime risk/100,000 picoCuries
Immersion	lifetime risk-cubic cm/100,000 picoCurie-years
Surface	lifetime risk-square cm/100,000 picoCurie-years

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

FACTOR
Page 4

* NUCLIDE AM-241 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	1.001E-03	1.212E-01	1.151E+08	3.541E+04
BREAST	9.709E-05	1.176E-02	1.469E+08	5.550E+04
R MAR	6.327E-03	7.663E-01	3.737E+07	1.077E+04
LUNGS	9.714E-05	8.047E-02	6.919E+07	2.009E+04
THYROID	9.703E-05	1.175E-02	1.099E+08	3.175E+04
ENDOST	7.801E-02	9.447E+00	1.273E+08	3.693E+04
RMNDR	3.508E-03	4.176E-01	6.778E+07	1.937E+04
EFFEC	4.430E-03	5.428E-01	9.104E+07	2.875E+04

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	9.208E-03	1.110E+00	3.452E+09	.062E+06
OVARIES	9.232E-03	1.112E+00	1.521E+09	4.384E+05
AVERAGE	9.221E-03	1.111E+00	2.486E+09	7.504E+05

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.337E-04	6.457E-02	1.184E+01	3.410E-03
BONE	3.433E-04	4.152E-02	2.253E+00	6.535E-04
THYROID	1.062E-06	1.283E-04	4.998E+00	1.444E-03
BREAST	7.158E-06	8.639E-04	5.751E+01	2.174E-02
LUNG	9.643E-06	2.284E-02	3.429E+01	9.960E-03
STOMACH	6.586E-06	7.140E-04	1.852E+01	5.317E-03
BOWEL	1.094E-05	3.603E-04	8.526E+00	2.445E-03
LIVER	1.198E-03	1.448E-01	2.179E+01	6.239E-03
PANCREAS	4.480E-06	5.408E-04	9.503E+00	2.760E-03
URINARY	2.298E-06	2.773E-04	8.681E+00	2.479E-03
OTHER	5.479E-06	6.614E-04	1.162E+01	3.376E-03

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.197E-10	3.843E-08	6.464E+02	1.951E-01
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
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C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C O N C E N T R A T I O N T A B L E S

Non-Radon Individual Assessment
Apr 3, 2002 02:21 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR 191 Report.

Dataset Name: 2000b191
Dataset Date: Apr 3, 2002 02:18 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

CONCEN
Page 1

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Nuclide	Air Concentration (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition Rate (pCi/cm ² /s)
N	350	PU-238	2.5E-09	4.4E-16	9.5E-17	5.4E-16
N	350	PU-239	3.2E-09	.7E-16	1.2E-16	6.9E-16
N	350	AM-241	3.4E-09	6.1E-16	1.3E-16	7.4E-16
NNW	350	PU-238	4.1E-09	7.3E-16	1.2E-16	8.5E-16
NNW	350	PU-239	5.3E-09	9.5E-16	1.6E-16	1.1E-15
NNW	350	AM-241	5.6E-09	1.0E-15	1.7E-16	1.2E-15
NW	350	PU-238	5.5E-09	9.9E-16	1.7E-16	1.2E-15
NW	350	PU-239	7.2E-09	1.3E-15	2.3E-16	1.5E-15
NW	350	AM-241	7.6E-09	1.4E-15	2.4E-16	1.6E-15
WNW	350	PU-238	3.7E-09	6.7E-16	1.6E-16	8.3E-16
WNW	350	PU-239	4.8E-09	8.7E-16	2.1E-16	1.1E-15
WNW	350	AM-241	5.1E-09	9.3E-16	2.2E-16	1.1E-15
W	350	PU-238	2.9E-09	5.2E-16	9.0E-17	6.1E-16
W	350	PU-239	3.8E-09	6.8E-16	1.2E-16	8.0E-16
W	350	AM-241	4.0E-09	7.2E-16	1.2E-16	8.5E-16
WSW	350	PU-238	1.9E-09	3.5E-16	5.7E-17	4.1E-16
WSW	350	PU-239	2.5E-09	4.6E-16	7.4E-17	5.3E-16
WSW	350	AM-241	2.7E-09	4.9E-16	7.9E-17	5.6E-16
SW	350	PU-238	1.7E-09	3.0E-16	5.9E-17	3.6E-16
SW	350	PU-239	2.2E-09	3.9E-16	7.7E-17	4.7E-16
SW	350	AM-241	2.3E-09	4.1E-16	8.1E-17	5.0E-16
SSW	350	PU-238	1.7E-09	3.0E-16	5.9E-17	3.6E-16
SSW	350	PU-239	2.2E-09	3.9E-16	7.7E-17	4.6E-16
SSW	350	AM-241	2.3E-09	4.1E-16	8.2E-17	4.9E-16
S	350	PU-238	1.7E-09	3.1E-16	5.4E-17	3.7E-16
S	350	PU-239	2.3E-09	4.1E-16	7.1E-17	4.8E-16
S	350	AM-241	2.4E-09	4.3E-16	7.5E-17	5.1E-16
SSE	350	PU-238	1.7E-09	3.0E-16	5.3E-17	3.5E-16
SSE	350	PU-239	2.2E-09	3.9E-16	6.8E-17	4.6E-16
SSE	350	AM-241	2.3E-09	4.2E-16	7.2E-17	4.9E-16
SE	350	PU-238	1.7E-09	3.1E-16	5.2E-17	3.6E-16
SE	350	PU-239	2.2E-09	4.0E-16	6.7E-17	4.7E-16
SE	350	AM-241	2.4E-09	4.3E-16	7.1E-17	5.0E-16
ESE	350	PU-238	1.8E-09	3.2E-16	5.4E-17	3.8E-16
ESE	350	PU-239	2.3E-09	4.2E-16	7.0E-17	4.9E-16
ESE	350	AM-241	2.5E-09	4.4E-16	7.4E-17	5.2E-16
E	350	PU-238	2.9E-09	5.2E-16	6.3E-17	5.9E-16
E	350	PU-239	3.8E-09	6.8E-16	8.2E-17	7.6E-16
E	350	AM-241	4.0E-09	7.3E-16	8.7E-17	8.1E-16
ENE	350	PU-238	2.5E-09	4.4E-16	6.0E-17	5.0E-16
ENE	350	PU-239	3.2E-09	5.7E-16	7.8E-17	6.5E-16
ENE	350	AM-241	3.4E-09	6.1E-16	8.3E-17	6.9E-16

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

CONCEN
Page 2

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Nuclide	Air Concentration (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition Rate (pCi/cm ² /s)
NE	350	PU-238	1.8E-09	3.3E-16	5.7E-17	3.9E-16
NE	350	PU-239	2.4E-09	4.3E-16	7.4E-17	5.0E-16
NE	350	AM-241	2.5E-09	4.5E-16	7.8E-17	5.3E-16
NNE	350	PU-238	1.9E-09	3.5E-16	6.7E-17	4.2E-16
NNE	350	PU-239	2.5E-09	4.5E-16	8.7E-17	5.4E-16
NNE	350	AM-241	2.7E-09	4.8E-16	9.3E-17	5.7E-16

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C H I / Q T A B L E S

Non-Radon Individual Assessment
Apr 3, 2002 02:21 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR 191 Report.

Dataset Name: 2000b191
Dataset Date: Apr 3, 2002 02:18 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

CHI/Q
Page 1

GROUND-LEVEL CHI/Q VALUES FOR PU-238
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	350
N	1.375E-06
NNW	2.279E-06
NW	3.094E-06
WNW	2.086E-06
W	1.624E-06
WSW	1.091E-06
SW	9.323E-07
SSW	9.293E-07
S	9.787E-07
SSE	9.407E-07
SE	9.666E-07
ESE	1.004E-06
E	1.632E-06
ENE	1.379E-06
NE	1.033E-06
NNE	1.086E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 3, 2002 02:21 pm

CHI/Q
Page 2

GROUND-LEVEL CHI/Q VALUES FOR PU-239
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	350
N	1.362E-06
NNW	2.276E-06
NW	3.098E-06
WNW	2.079E-06
W	1.625E-06
WSW	1.094E-06
SW	9.328E-07
SSW	9.276E-07
S	9.757E-07
SSE	9.343E-07
SE	9.592E-07
ESE	9.966E-07
E	1.637E-06
ENE	1.376E-06
NE	1.022E-06
NNE	1.076E-06

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 3, 2002 02:21 pm

CHI/Q
Page 3

GROUND-LEVEL CHI/Q VALUES FOR AM-241
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	350
N	1.372E-06
NNW	2.287E-06
NW	3.114E-06
WNW	2.095E-06
W	1.634E-06
WSW	1.099E-06
SW	9.371E-07
SSW	9.325E-07
S	9.816E-07
SSE	9.412E-07
SE	9.661E-07
ESE	1.004E-06
E	1.641E-06
ENE	1.382E-06
NE	1.030E-06
NNE	1.083E-06

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Attachment 2 to Appendix B

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Apr 8, 2002 02:30 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Effective Dose Equivalent
(mrem/year)

5.20E-06

At This Location: 7,500 Meters West Northwest
Dataset Name: 2000bb191
Dataset Date: Apr 8, 2002 02:30 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

SYNOPSIS
Page 1

MAXIMALLY EXPOSED INDIVIDUAL

Location of the Individual: 7,500 Meters West Northwest
Lifetime Fatal Cancer Risk: 2.67E-11

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	1.16E-06
BREAST	1.16E-07
R MAR	7.35E-06
LUNGS	7.46E-07
THYROID	1.14E-07
ENDOST	9.05E-05
RMNDR	4.01E-06
EFFEC	5.20E-06

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

SYNOPSIS
Page 2

RADIONUCLIDE EMISSIONS DURING THE YEAR 2000

Nuclide	Class	Size	#1 Ci/y	Source #2 Ci/y	Source #3 Ci/y	Source TOTAL Ci/y
U-238	W	1.00	4.6E-08	2.7E-09	7.5E-09	5.6E-08
PU-239	W	1.00	6.4E-08	2.0E-09	7.1E-09	7.3E-08
AM-241	W	1.00	6.6E-08	3.2E-09	8.2E-09	7.7E-08

SITE INFORMATION

Temperature: 17 degrees C
Precipitation: 30 cm/y
Mixing Height: 1000 m

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 8, 2002 02:30 pm

SYNOPSIS
Page 3

SOURCE INFORMATION

Source Number:	1	2	3
Stack Height (m):	8	7	20
Diameter (m):	5	2	3
Plume Rise Momentum (m/s): (Exit Velocity)	7	11	3

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	1.000	1.000	1.000
Fraction From Assessment Area:	0.000	0.000	0.000
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES (M) USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

7,500

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

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G E N E R A L D A T A

Non-Radon Individual Assessment

Apr 8, 2002 02:30 pm

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GENERAL
Page 1

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	Clearance Class	Particle Size (microns)	Scavenging Coefficient (per second)	Dry Deposition Velocity (m/s)
PU-238	W	1.0	3.00E-06	1.80E-03
PU-239	W	1.0	3.00E-06	1.80E-03
AM-241	W	1.0	3.00E-06	1.80E-03

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

GENERAL
Page 2

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	DECAY CONSTANT (PER DAY)		TRANSFER COEFFICIENT		
	Radioactive (1)	Surface	Water	Milk (2)	Meat (3)
PU-238	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
PU-239	0.00E+00	5.48E-05	0.00E+00	1.00E-07	5.00E-07
AM-241	0.00E+00	5.48E-05	0.00E+00	4.00E-07	3.50E-06

- FOOTNOTES:
- (1) Effective radioactive decay constant in plume; set to zero if less than 1.0E-2
 - (2) Fraction of animal's daily intake of nuclide which appears in each L of milk (days/L)
 - (3) Fraction of animal's daily intake of nuclide which appears in each kg of meat (days/kg)
-

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

GENERAL
Page 3

VALUES FOR RADIONUCLIDE-DEPENDENT PARAMETERS

Nuclide	CONCENTRATION UPTAKE FACTOR		GI UPTAKE FRACTION	
	Forage (1)	Edible (2)	Inhalation	Ingestion
PU-238	4.50E-04	1.93E-05	1.00E-03	1.00E-03
PU-239	4.50E-04	1.93E-05	1.00E-04	1.00E-03
AM-241	5.50E-03	1.07E-04	1.00E-03	1.00E-03

- FOOTNOTES:
- (1) Concentration factor for uptake of nuclide from soil for pasture and forage (in pCi/kg dry weight per pCi/kg dry soil)
 - (2) Concentration factor for uptake of nuclide from soil by edible parts of crops (in pCi/kg wet weight per pCi/kg dry soil)

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 8, 2002 02:30 pm

GENERAL
Page 4

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

HUMAN INHALATION RATE	
Cubic centimeters/hr	9.17E+05
SOIL PARAMETERS	
Effective surface density (kg/sq m, dry weight) (Assumes 15 cm plow layer)	2.15E+02
BUILDUP TIMES	
For activity in soil (years)	1.00E+02
For radionuclides deposited on ground/water (days)	3.65E+04
DELAY TIMES	
Ingestion of pasture grass by animals (hr)	0.00E+00
Ingestion of stored feed by animals (hr)	2.16E+03
Ingestion of leafy vegetables by man (hr)	3.36E+02
Ingestion of produce by man (hr)	3.36E+02
Transport time from animal feed-milk-man (day)	2.00E+00
Time from slaughter to consumption (day)	2.00E+01
WEATHERING	
Removal rate constant for physical loss (per hr)	2.90E-03
CROP EXPOSURE DURATION	
Pasture grass (hr)	7.20E+02
Crops/leafy vegetables (hr)	1.44E+03
AGRICULTURAL PRODUCTIVITY	
Grass-cow-milk-man pathway (kg/sq m)	2.80E-01
Produce/leafy veg for human consumption (kg/sq m)	7.16E-01
FALLOUT INTERCEPTION FRACTIONS	
Vegetables	2.00E-01
Pasture	5.70E-01
GRAZING PARAMETERS	
Fraction of year animals graze on pasture	4.00E-01
Fraction of daily feed that is pasture grass when animal grazes on pasture	4.30E-01

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
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Apr 8, 2002 02:30 pm

GENERAL
Page 5

VALUES FOR RADIONUCLIDE-INDEPENDENT PARAMETERS

ANIMAL FEED CONSUMPTION FACTORS	
Contaminated feed/forage (kg/day, dry weight)	1.56E+01
DAIRY PRODUCTIVITY	
Milk production of cow (L/day)	1.10E+01
MEAT ANIMAL SLAUGHTER PARAMETERS	
Muscle mass of animal at slaughter (kg)	2.00E+02
Fraction of herd slaughtered (per day)	3.81E-03
DECONTAMINATION	
Fraction of radioactivity retained after washing for leafy vegetables and produce	5.00E-01
FRACTIONS GROWN IN GARDEN OF INTEREST	
Produce ingested	1.00E+00
Leafy vegetables ingested	1.00E+00
INGESTION RATIOS:	
IMMEDIATE SURROUNDING AREA/TOTAL WITHIN AREA	
Vegetables	1.00E+00
Meat	1.00E+00
Milk	1.00E+00
MINIMUM INGESTION FRACTIONS FROM OUTSIDE AREA (Minimum fractions of food types from outside area listed below are actual fixed values.)	
Vegetables	0.00E+00
Meat	0.00E+00
Milk	0.00E+00
HUMAN FOOD UTILIZATION FACTORS	
Produce ingestion (kg/y)	1.76E+02
Milk ingestion (L/y)	1.12E+02
Meat ingestion (kg/y)	8.50E+01
Leafy vegetable ingestion (kg/y)	1.80E+01
SWIMMING PARAMETERS	
Fraction of time spent swimming	0.00E+00
Dilution factor for water (cm)	1.00E+00

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WEATHER
Page 1

HARMONIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class								
Dir	A	B	C	D	E	F	G	Wind Freq
N	4.316	3.287	2.956	2.406	1.861	1.673	0.000	0.065
NNW	4.678	3.731	3.211	3.161	3.516	2.173	0.000	0.102
NW	4.702	3.763	3.472	3.928	4.246	2.813	0.000	0.162
WNW	4.365	3.707	3.448	3.428	3.790	3.166	0.000	0.142
W	4.490	3.680	3.132	3.718	3.432	2.539	0.000	0.074
WSW	4.374	3.449	3.466	3.733	3.465	2.200	0.000	0.045
SW	4.627	3.720	3.078	3.497	2.609	2.087	0.000	0.041
SSW	4.721	3.339	3.187	3.470	2.482	2.080	0.000	0.042
S	4.775	3.691	3.381	3.197	2.867	2.115	0.000	0.041
SSE	4.836	3.418	2.886	2.686	2.027	2.093	0.000	0.036
SE	4.289	3.306	2.614	2.097	2.529	1.709	0.000	0.033
ESE	4.031	2.793	2.376	1.864	2.207	1.737	0.000	0.033
E	5.485	3.338	2.777	2.521	3.483	2.097	0.000	0.054
ENE	4.690	2.966	2.700	2.247	2.937	2.120	0.000	0.048
NE	4.160	2.780	2.366	1.762	2.116	1.696	0.000	0.037
NNE	4.062	2.997	2.541	2.030	2.072	1.548	0.000	0.045

ARITHMETIC AVERAGE WIND SPEEDS (WIND TOWARDS)

Pasquill Stability Class							
Dir	A	B	C	D	E	F	G
N	4.838	3.860	3.710	3.611	2.996	2.433	0.000
NNW	5.292	4.449	4.129	4.709	4.858	2.998	0.000
NW	5.366	4.460	4.444	5.514	5.410	3.574	0.000
WNW	4.915	4.409	4.249	4.871	5.008	3.921	0.000
W	5.255	4.337	4.276	5.534	5.176	3.740	0.000
WSW	5.230	4.496	4.532	5.878	5.119	3.221	0.000
SW	5.636	4.642	4.515	5.550	4.448	2.944	0.000
SSW	5.536	4.247	4.289	5.238	3.817	3.016	0.000
S	5.613	4.430	4.567	4.749	4.265	3.161	0.000
SSE	5.885	4.300	3.667	4.485	3.532	3.270	0.000
SE	4.968	3.927	3.526	3.644	4.203	2.832	0.000
ESE	4.831	3.371	3.247	3.745	3.902	2.869	0.000
E	7.011	5.066	4.827	5.533	5.517	3.479	0.000
ENE	5.812	4.244	4.082	4.305	4.550	3.319	0.000
NE	5.173	3.558	3.285	3.231	3.477	2.651	0.000
NNE	4.695	3.535	3.223	3.279	3.312	2.329	0.000

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
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Apr 8, 2002 02:30 pm

WEATHER
Page 2

FREQUENCIES OF STABILITY CLASSES (WIND TOWARDS)

Dir	Pasquill Stability Class						
	A	B	C	D	E	F	G
N	0.4054	0.0755	0.0587	0.1246	0.1117	0.2241	0.0000
NNW	0.2905	0.0542	0.0464	0.1514	0.2004	0.2571	0.0000
NW	0.1586	0.0329	0.0305	0.1327	0.2805	0.3648	0.0000
WNW	0.0923	0.0241	0.0247	0.1107	0.2048	0.5434	0.0000
W	0.1172	0.0356	0.0355	0.1908	0.2368	0.3841	0.0000
WSW	0.1232	0.0350	0.0449	0.2430	0.2060	0.3480	0.0000
SW	0.1321	0.0361	0.0421	0.2354	0.1389	0.4154	0.0000
SSW	0.1417	0.0428	0.0490	0.2459	0.1306	0.3900	0.0000
S	0.1824	0.0547	0.0535	0.2204	0.1910	0.2980	0.0000
SSE	0.2230	0.0678	0.0568	0.2221	0.1631	0.2672	0.0000
SE	0.2240	0.0923	0.0930	0.2069	0.1481	0.2356	0.0000
ESE	0.2814	0.0879	0.0784	0.1877	0.1323	0.2324	0.0000
E	0.3832	0.0690	0.0683	0.1695	0.1526	0.1574	0.0000
ENE	0.4052	0.0835	0.0743	0.1602	0.1175	0.1593	0.0000
NE	0.4123	0.0933	0.0799	0.1439	0.1045	0.1660	0.0000
NNE	0.4284	0.0968	0.0704	0.1217	0.0919	0.1909	0.0000
TOTAL	0.2272	0.0528	0.0487	0.1635	0.1851	0.3228	0.0000

ADDITIONAL WEATHER INFORMATION

Average Air Temperature: 17.0 degrees C
 290.16 K
 Precipitation: 30.0 cm/y
 Lid Height: 1000 meters
 Surface Roughness Length: 0.010 meters
 Height of Wind Measurements: 10.0 meters
 Average Wind Speed: 4.411 m/s

Vertical Temperature Gradients:

STABILITY E 0.073 k/m
 STABILITY F 0.109 k/m
 STABILITY G 0.146 k/m

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

CAP88-PC

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK EQUIVALENT SUMMARIES

Non-Radon Individual Assessment
Apr 8, 2002 02:30 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Dataset Name: 2000bb191
Dataset Date: Apr 8, 2002 02:30 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)
-----	-----
GONADS	1.16E-06
BREAST	1.16E-07
R MAR	7.35E-06
LUNGS	7.46E-07
THYROID	1.14E-07
ENDOST	9.05E-05
RMNDR	4.01E-06
EFFEC	5.20E-06

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
-----	-----
INGESTION	3.32E-07
INHALATION	4.87E-06
AIR IMMERSION	4.02E-14
GROUND SURFACE	1.69E-09
INTERNAL	5.20E-06
EXTERNAL	1.69E-09
TOTAL	5.20E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 8, 2002 02:30 pm

SUMMARY
Page 2

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
-----	-----
PU-238	1.29E-06
PU-239	1.87E-06
AM-241	2.04E-06
TOTAL	5.20E-06

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 8, 2002 02:30 pm

SUMMARY
Page 3

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
LEUKEMIA	6.20E-12
BONE	3.99E-12
THYROID	1.32E-14
BREAST	9.67E-14
LUNG	2.11E-12
STOMACH	7.24E-14
BOWEL	4.20E-14
LIVER	1.40E-11
PANCREAS	5.37E-14
URINARY	2.81E-14
OTHER	6.57E-14
TOTAL	2.67E-11

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
INGESTION	1.60E-12
INHALATION	2.50E-11
AIR IMMERSION	8.37E-19
GROUND SURFACE	3.52E-14
INTERNAL	2.66E-11
EXTERNAL	3.52E-14
TOTAL	2.67E-11

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 8, 2002 02:30 pm

SUMMARY
Page 4

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
<hr/>	<hr/>
PU-238	6.85E-12
PU-239	9.41E-12
AM-241	1.04E-11
TOTAL	2.67E-11

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	7,500
-----------	-------

N	1.9E-06
NNW	2.8E-06
NW	5.0E-06
WNW	5.2E-06
W	2.6E-06
WSW	1.6E-06
SW	1.7E-06
SSW	1.6E-06
S	1.4E-06
SSE	1.2E-06
SE	1.1E-06
ESE	1.1E-06
E	1.2E-06
ENE	1.0E-06
NE	9.6E-07
NNE	1.2E-06

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

SUMMARY
Page 6

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)

Direction	7,500
-----------	-------

N	9.6E-12
NNW	1.5E-11
NW	2.5E-11
WNW	2.7E-11
W	1.3E-11
WSW	8.1E-12
SW	8.5E-12
SSW	8.4E-12
S	7.0E-12
SSE	6.3E-12
SE	5.6E-12
ESE	5.6E-12
E	6.1E-12
ENE	5.3E-12
NE	4.9E-12
NNE	6.1E-12

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C H I / Q T A B L E S

Non-Radon Individual Assessment
Apr 8, 2002 02:30 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Dataset Name: 2000bb191
Dataset Date: Apr 8, 2002 02:30 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

CHI/Q
Page 1

GROUND-LEVEL CHI/Q VALUES FOR PU-238
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	7,500
N	6.415E-08
NNW	9.712E-08
NW	1.697E-07
WNW	1.784E-07
W	8.896E-08
WSW	5.393E-08
SW	5.695E-08
SSW	5.589E-08
S	4.704E-08
SSE	4.184E-08
SE	3.745E-08
ESE	3.708E-08
E	4.044E-08
ENE	3.542E-08
NE	3.274E-08
NNE	4.045E-08

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

CHI/Q
Page 2

GROUND-LEVEL CHI/Q VALUES FOR PU-239
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	7,500
N	6.393E-08
NNW	9.696E-08
NW	1.696E-07
WNW	1.784E-07
W	8.893E-08
WSW	5.386E-08
SW	5.683E-08
SSW	5.579E-08
S	4.698E-08
SSE	4.180E-08
SE	3.738E-08
ESE	3.701E-08
E	4.042E-08
ENE	3.539E-08
NE	3.267E-08
NNE	4.030E-08

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

CHIQ
Page 3

GROUND-LEVEL CHI/Q VALUES FOR AM-241
CHI/Q TOWARD INDICATED DIRECTION (SEC/CUBIC METER)

Distance (meters)

Direction	7,500
N	6.404E-08
NNW	9.706E-08
NW	1.697E-07
WNW	1.785E-07
W	8.898E-08
WSW	5.391E-08
SW	5.690E-08
SSW	5.585E-08
S	4.702E-08
SSE	4.183E-08
SE	3.742E-08
ESE	3.705E-08
E	4.044E-08
ENE	3.541E-08
NE	3.270E-08
NNE	4.037E-08

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

C O N C E N T R A T I O N T A B L E S

Non-Radon Individual Assessment
Apr 8, 2002 02:30 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Dataset Name: 2000bb191
Dataset Date: Apr 8, 2002 02:30 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

CONCEN
Page 1

**ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT**

Wind Toward	Distance (meters)	Nuclide	Air Concentration (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition Rate (pCi/cm ² /s)
N	7,500	PU-238	1.1E-10	2.1E-17	4.1E-18	2.5E-17
N	7,500	PU-239	1.5E-10	2.7E-17	5.4E-18	3.2E-17
N	7,500	AM-241	1.6E-10	2.8E-17	5.7E-18	3.4E-17
NNW	7,500	PU-238	1.7E-10	3.1E-17	5.4E-18	3.7E-17
NNW	7,500	PU-239	2.2E-10	4.0E-17	7.0E-18	4.7E-17
NNW	7,500	AM-241	2.4E-10	4.3E-17	7.4E-18	5.0E-17
NW	7,500	PU-238	3.0E-10	5.4E-17	7.7E-18	6.2E-17
NW	7,500	PU-239	3.9E-10	7.1E-17	1.0E-17	8.1E-17
NW	7,500	AM-241	4.2E-10	7.5E-17	1.1E-17	8.6E-17
WNW	7,500	PU-238	3.2E-10	5.7E-17	7.0E-18	6.4E-17
WNW	7,500	PU-239	4.1E-10	7.4E-17	9.1E-18	8.4E-17
WNW	7,500	AM-241	4.4E-10	7.9E-17	9.6E-18	8.8E-17
W	7,500	PU-238	1.6E-10	2.9E-17	3.9E-18	3.2E-17
W	7,500	PU-239	2.1E-10	3.7E-17	5.1E-18	4.2E-17
W	7,500	AM-241	2.2E-10	3.9E-17	5.4E-18	4.5E-17
WSW	7,500	PU-238	9.6E-11	1.7E-17	2.5E-18	2.0E-17
WSW	7,500	PU-239	1.2E-10	2.2E-17	3.2E-18	2.6E-17
WSW	7,500	AM-241	1.3E-10	2.4E-17	3.4E-18	2.7E-17
SW	7,500	PU-238	1.0E-10	1.8E-17	2.5E-18	2.1E-17
SW	7,500	PU-239	1.3E-10	2.4E-17	3.3E-18	2.7E-17
SW	7,500	AM-241	1.4E-10	2.5E-17	3.5E-18	2.9E-17
SSW	7,500	PU-238	1.0E-10	1.8E-17	2.6E-18	2.0E-17
SSW	7,500	PU-239	1.3E-10	2.3E-17	3.3E-18	2.7E-17
SSW	7,500	AM-241	1.4E-10	2.5E-17	3.5E-18	2.8E-17
S	7,500	PU-238	8.4E-11	1.5E-17	2.4E-18	1.7E-17
S	7,500	PU-239	1.1E-10	2.0E-17	3.1E-18	2.3E-17
S	7,500	AM-241	1.2E-10	2.1E-17	3.3E-18	2.4E-17
SSE	7,500	PU-238	7.5E-11	1.3E-17	2.3E-18	1.6E-17
SSE	7,500	PU-239	9.7E-11	1.7E-17	3.0E-18	2.0E-17
SSE	7,500	AM-241	1.0E-10	1.8E-17	3.1E-18	2.2E-17
SE	7,500	PU-238	6.7E-11	1.2E-17	2.2E-18	1.4E-17
SE	7,500	PU-239	8.7E-11	1.6E-17	2.9E-18	1.8E-17
SE	7,500	AM-241	9.2E-11	1.7E-17	3.1E-18	2.0E-17
ESE	7,500	PU-238	6.6E-11	1.2E-17	2.3E-18	1.4E-17
ESE	7,500	PU-239	8.6E-11	1.5E-17	3.0E-18	1.8E-17
ESE	7,500	AM-241	9.1E-11	1.6E-17	3.2E-18	2.0E-17
E	7,500	PU-238	7.2E-11	1.3E-17	2.8E-18	1.6E-17
E	7,500	PU-239	9.4E-11	1.7E-17	3.6E-18	2.0E-17

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

CONCEN
Page 2

ESTIMATED RADIONUCLIDE CONCENTRATIONS
AT VARIOUS LOCATIONS IN THE ENVIRONMENT

Wind Toward	Distance (meters)	Nuclide	Air Concentration (pCi/m ³)	Dry Deposition Rate (pCi/cm ² /s)	Wet Deposition Rate (pCi/cm ² /s)	Ground Deposition Rate (pCi/cm ² /s)
E	7,500	AM-241	9.9E-11	1.8E-17	3.8E-18	2.2E-17
ENE	7,500	PU-238	6.3E-11	1.1E-17	2.7E-18	1.4E-17
ENE	7,500	PU-239	8.2E-11	1.5E-17	3.4E-18	1.8E-17
ENE	7,500	AM-241	8.7E-11	1.6E-17	3.7E-18	1.9E-17
NE	7,500	PU-238	5.8E-11	1.1E-17	2.5E-18	1.3E-17
NE	7,500	PU-239	7.6E-11	1.4E-17	3.2E-18	1.7E-17
NE	7,500	AM-241	8.0E-11	1.4E-17	3.4E-18	1.8E-17
NNE	7,500	PU-238	7.2E-11	1.3E-17	2.9E-18	1.6E-17
NNE	7,500	PU-239	9.3E-11	1.7E-17	3.8E-18	2.1E-17
NNE	7,500	AM-241	9.9E-11	1.8E-17	4.0E-18	2.2E-17

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

C A P 8 8 - P C

Version 2.00

Clean Air Act Assessment Package - 1988

DOSE AND RISK CONVERSION FACTORS

Non-Radon Individual Assessment
Apr 8, 2002 02:30 pm

Facility: Waste Isolation Pilot Plant
Address: 26 miles SE of Carlsbad, NM
City: Carlsbad
State: NM Zip: 88221

Source Category: Exempt DOE Facility
Source Type: Stack
Emission Year: 2000

Comments: This is the WIPP 2000 40 CFR Part 191 Report.

Dataset Name: 2000bb191
Dataset Date: Apr 8, 2002 02:30 pm
Wind File: C:\CAP88PC2\WINDFILES\96-99.WND

Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171

Apr 8, 2002 02:30 pm

FACTOR
Page 1

DOSE AND RISK FACTOR UNITS

The units for each type of dose rate conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	millirem/picoCurie
Inhalation	millirem/picoCurie
Immersion	millirem-cubic cm/microcurie-year
Surface	millirem-square cm/microcurie-year

Risks for internal exposures (inhalation and ingestion) are the lifetime risk of premature death in a birth cohort of 100,000 people for a 1 picoCurie/year intake rate, where the average lifetime is 70.7565 years.

This is simplified to lifetime risk per 100,000 picoCuries.

The units for each type of risk conversion factor are shown below, by pathway:

Pathway	Units
_____	_____
Ingestion	lifetime risk/100,000 picoCuries
Inhalation	lifetime risk/100,000 picoCuries
Immersion	lifetime risk-cubic cm/100,000 picoCurie-years
Surface	lifetime risk-square cm/100,000 picoCurie-years

**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

FACTOR
Page 2

* NUCLIDE PU-238 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	8.603E-04	1.041E-01	4.218E+05	7.548E+02
BREAST	8.419E-05	1.020E-02	1.806E+06	4.070E+03
R MAR	5.485E-03	6.641E-01	5.291E+04	4.514E+01
LUNGS	8.419E-05	7.893E-02	1.177E+05	1.225E+02
THYROID	8.419E-05	1.020E-02	1.709E+05	1.510E+02
ENDOST	6.763E-02	8.189E+00	2.090E+05	2.050E+02
RMNDR	3.085E-03	3.666E-01	8.732E+04	7.659E+01
EFFEC	3.853E-03	4.726E-01	4.344E+05	8.530E+02

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	8.657E-03	1.043E+00	1.265E+07	2.264E+04
OVARIES	8.673E-03	1.045E+00	2.331E+06	2.087E+03
AVERAGE	8.665E-03	1.044E+00	7.492E+06	1.237E+04

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	4.695E-04	5.676E-02	1.676E-02	1.430E-05
BONE	3.046E-04	3.681E-02	3.700E-03	3.628E-06
THYROID	9.438E-07	1.140E-04	7.775E-03	6.866E-06
BREAST	6.493E-06	7.839E-04	7.072E-01	1.594E-03
LUNG	8.684E-06	2.272E-02	5.833E-02	6.072E-05
STOMACH	5.991E-06	6.480E-04	2.550E-02	1.840E-05
BOWEL	1.016E-05	3.272E-04	1.083E-02	6.451E-06
LIVER	1.099E-03	1.327E-01	2.503E-02	9.235E-06
PANCREAS	4.054E-06	4.895E-04	1.656E-02	1.864E-05
URINARY	2.080E-06	2.511E-04	1.007E-02	3.352E-06
OTHER	4.959E-06	5.987E-04	2.026E-02	2.280E-05

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	2.992E-10	3.604E-08	1.948E+00	3.216E-03
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

FACTOR
Page 3

* NUCLIDE PU-239 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	9.741E-04	1.180E-01	4.329E+05	3.463E+02
BREAST	9.453E-05	1.145E-02	9.990E+05	1.617E+03
R MAR	6.166E-03	7.471E-01	1.950E+05	5.587E+01
LUNGS	9.453E-05	7.609E-02	2.420E+05	8.954E+01
THYROID	9.453E-05	1.145E-02	3.385E+05	1.165E+02
ENDOST	7.593E-02	9.199E+00	3.996E+05	1.473E+02
RMNDR	3.399E-03	4.054E-01	2.250E+05	6.734E+01
EFFEC	4.310E-03	5.278E-01	4.002E+05	3.747E+02

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	8.801E-03	1.061E+00	1.299E+07	1.039E+04
OVARIES	8.777E-03	1.058E+00	5.506E+06	1.798E+03
AVERAGE	8.789E-03	1.059E+00	9.246E+06	6.094E+03

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.183E-04	6.271E-02	6.176E-02	1.770E-05
BONE	3.323E-04	4.019E-02	7.072E-03	2.606E-06
THYROID	1.027E-06	1.242E-04	1.540E-02	5.301E-06
BREAST	6.868E-06	8.298E-04	3.913E-01	6.333E-04
LUNG	9.263E-06	2.149E-02	1.200E-01	4.439E-05
STOMACH	6.254E-06	6.858E-04	6.736E-02	1.961E-05
BOWEL	9.813E-06	3.457E-04	3.275E-02	8.719E-06
LIVER	1.148E-03	1.387E-01	7.186E-02	1.699E-05
PANCREAS	4.289E-06	5.181E-04	4.236E-02	1.502E-05
URINARY	2.200E-06	2.658E-04	2.614E-02	6.081E-06
OTHER	5.246E-06	6.337E-04	5.181E-02	1.838E-05

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.034E-10	3.656E-08	2.404E+00	1.584E-03
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**Waste Isolation Pilot Plant Biennial Environmental Compliance Report
DOE/WIPP 02-2171**

Apr 8, 2002 02:30 pm

FACTOR
Page 4

* NUCLIDE AM-241 *

DOSE RATE CONVERSION FACTORS

Organ	Ingestion	Inhalation	Air Immersion	Ground Surface
GONADS	1.001E-03	1.212E-01	1.151E+08	3.541E+04
BREAST	9.709E-05	1.176E-02	1.469E+08	5.550E+04
R MAR	6.327E-03	7.663E-01	3.737E+07	1.077E+04
LUNGS	9.714E-05	8.047E-02	6.919E+07	2.009E+04
THYROID	9.703E-05	1.175E-02	1.099E+08	3.175E+04
ENDOST	7.801E-02	9.447E+00	1.273E+08	3.693E+04
RMNDR	3.508E-03	4.176E-01	6.778E+07	1.937E+04
EFFEC	4.430E-03	5.428E-01	9.104E+07	2.875E+04

GENETIC EFFECT DOSE RATE CONVERSION FACTORS

TESTES	9.208E-03	1.110E+00	3.452E+09	1.062E+06
OVARIES	9.232E-03	1.112E+00	1.521E+09	4.384E+05
AVERAGE	9.221E-03	1.111E+00	2.486E+09	7.504E+05

RISK CONVERSION FACTORS

Cancer	Ingestion	Inhalation	Air Immersion	Ground Surface
LEUKEMIA	5.337E-04	6.457E-02	1.184E+01	3.410E-03
BONE	3.433E-04	4.152E-02	2.253E+00	6.535E-04
THYROID	1.062E-06	1.283E-04	4.998E+00	1.444E-03
BREAST	7.158E-06	8.639E-04	5.751E+01	2.174E-02
LUNG	9.643E-06	2.284E-02	3.429E+01	9.960E-03
STOMACH	6.586E-06	7.140E-04	1.852E+01	5.317E-03
BOWEL	1.094E-05	3.603E-04	8.526E+00	2.445E-03
LIVER	1.198E-03	1.448E-01	2.179E+01	6.239E-03
PANCREAS	4.480E-06	5.408E-04	9.503E+00	2.760E-03
URINARY	2.298E-06	2.773E-04	8.681E+00	2.479E-03
OTHER	5.479E-06	6.614E-04	1.162E+01	3.376E-03

GENETIC EFFECT RISK CONVERSION FACTORS

AVERAGE	3.197E-10	3.843E-08	6.464E+02	1.951E-01
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