

Contents

2017 Manual Contributors	viii
Introduction: Déjà vu	ix
Chapter 1: Prevention of Significant Deterioration (PSD)	
Applicability	1
<i>By Gary McCutchen, PE, BCEE, QEP, and Principal, RTP Environmental Associates, Inc.</i>	
I. Introduction	1
II. New Source PSD Applicability Determinations	2
II.A. Definition of a Stationary Source	2
II.A.1. Stationary Source Definition	3
II.A.2. The Regulations	3
II.A.3. Components of a Source Determination	5
II.A.3.a. Criterion 1: Same Industrial Grouping	5
II.A.3.b. Criterion 2: Contiguous or Adjacent	11
II.A.3.c. Criterion 3: Common Control	14
II.A.4. Temporary Sources/Emissions	18
II.A.5. Test Cells/Standards	18
II.A.6. Vessel Emissions	19
II.B. Major Stationary Source	20
II.B.1. Regulated NSR Pollutants	21
II.B.2. Emission Thresholds	25
II.B.2.a. Source Categories	25
II.B.2.b. Source Status: Minor or Major	29
II.B.2.c. Significant Emissions: Pollutants Subject to PSD Permitting	30
II.B.3. Potential to Emit	31
II.B.3.a. Basic Requirements	31
II.B.3.b. Enforceability of Limits	37
II.B.3.c. Fugitive Emissions	38
II.B.3.d. Secondary Emissions	42
II.B.3.e. Regulated NSR Pollutants	44
II.B.3.f. Methods for Determining Potential to Emit	47
II.B.3.g. Allowable Emissions	48
II.B.4. Local Air Quality Considerations for Criteria Pollutants	48
II.B.5. Converting from a Major to a Minor Stationary Source	49
II.B.6. Relaxing Limits Taken to Avoid Major NSR	49
II.B.6.a. History of Source Obligation Provision	50
II.B.6.b. 1979 Version of R4	51
II.B.6.c. 1980 Version of R4	51
II.B.6.d. 1989 Federal Register Preamble	51
II.B.6.e. Intent of R4	52
II.B.6.f. Modifications and R4	53
II.B.6.g. Conclusions	53
II.B.7. Summary of Major New Source Applicability	54
II.C. New Source Applicability Example	55
II.D. Reactivation of a Shutdown Source/Emissions Unit	56
III. Major Modification Applicability	58
III.A. Modifications	59
III.B. Interaction Between PSD and Nonattainment NSR	60
III.C. Modifications at Minor Stationary Sources	61
III.D. Modifications at Existing Major Sources	62
III.D.1. Physical/Operational Change	63
III.D.1.a. Routine Maintenance, Repair, and Replacement (RMRR)	64
III.D.1.b. Alternative Fuel under ESECA or FPA, or Section 125	66
III.D.1.c. Use of an Alternate Fuel or Raw Material	66
III.D.1.d. Increases in Operating Hours or Production Rate	68
III.D.1.e. Change in Ownership	69

III.D.1.f. Clean Coal Projects	69	IV. Top-Down Analysis Detailed Procedure	120
III.D.1.g. Other Exclusions	70	IV.A. Identify Alternative Emission Control Techniques (Step 1)	120
III.E. Emissions Increase Calculation (Project Emissions Increase)	70	IV.A.1. Demonstrated and Transferable Technologies	120
III.E.1. Project Emissions Increase	72	IV.A.2. Innovative Technologies	121
III.E.1.a. Initial Permitting (Construction) of New Units	73	IV.A.3. Consideration of Inherently Lower Polluting Processes/Practices	121
III.E.1.b. Modifications to New Units	73	IV.A.4. Example	123
III.E.1.c. Modifications to Existing Units	74	IV.B. Technical Feasibility Analysis (Step 2)	124
III.E.2. The Calculation	84	IV.C. Ranking the Technically Feasible Alternatives to Establish a Control Hierarchy (Step 3)	126
III.E.2.a. New Unit Project (All New Units)	84	IV.C.1. Choice of Units of Emissions Performance to Compare Levels Among Control Options	126
III.E.2.b. Existing Unit Project (All Existing Units)	85	IV.C.2. Control Techniques with a Wide Range of Emissions Performance Levels	127
III.E.2.c. Hybrid Project (Both New and Existing Units)	85	IV.C.3. Establishment of the Control Options Hierarchy	128
III.E.2.d. Replacement Units: A Special Case	86	IV.D. Economic, Energy, and Environmental Impacts (Step 4)	128
III.F. Emissions Netting (Contemporaneous Netting)	87	IV.D.1. Energy Impacts Analysis	130
III.F.1. Accumulation of Emissions	88	IV.D.2. Economic Impacts Analysis	131
III.F.2. Contemporaneous	90	IV.D.2.a. Estimating the Costs of Control	131
III.F.3. Creditable Emissions Changes	92	IV.D.2.b. Cost-Effectiveness	132
III.F.4. "Relied Upon" Emissions and Netting	93	IV.D.2.c. Determining an Adverse Economic Impact	136
III.F.5. Equivalent Effects, Trading, and Precursors	94	IV.D.3. Environmental Impacts Analysis	136
III.F.6. Creditable Amount	95	IV.D.3.a. Examples (Environmental Impacts)	137
III.F.7. Netting: Post-project Emissions for Existing Units	97	IV.D.3.b. Consideration of Emissions of Toxic and Hazardous Air Pollutants	138
III.F.8. Suggested Emissions Netting Procedure	107	IV.E. Selecting BACT (Step 5)	139
III.F.9. Netting Example	110	IV.F. Other Considerations	140
IV. General Exemptions	113	IV.G. Revising an Existing BACT Limit	140
IV.A. Sources and Modifications After December 31, 2002	113	V. Enforceability of BACT	141
IV.B. Sources Constructed Prior to December 31, 2002	114	VI. Example BACT Analyses for Gas Turbines	141
Chapter 2: Best Available Control Technology	115	VI.A. Example 1: Simple Cycle Gas Turbines Firing Natural Gas	141
<i>Ken Weiss, PE, BCEE, and Principal Partner, ERM; and David Jordan, PE and Partner, ERM</i>		VI.A.1. Project Summary	141
I. Introduction	115	VI.A.2. BACT Analysis Summary	142
II. BACT Applicability	117	VI.A.2.a. Control Technology Options	142
III. A Step-By-Step Summary of the Top-Down Process	118	VI.A.2.b. Technical Feasibility Considerations	142
III.A. Step 1: Identify All Control Technologies	118	VI.A.2.c. Control Technology Hierarchy	143
III.B. Step 2: Eliminate Technically Infeasible Options	119	VI.A.2.d. Impacts Analysis Summary	143
III.C. Step 3: Rank Remaining Control Technologies by Control Effectiveness	119	VI.A.2.e. Toxics Assessment	145
III.D. Step 4: Evaluate Most Effective Controls and Document Results	119	VI.A.2.f. Rationale for Proposed BACT	145
III.E. Step 5: Select BACT	120	VI.B. Example 2: Combined Cycle Gas Turbines Firing Natural Gas	145
		VI.C. Other Considerations	147

Chapter 3: Air Quality Analysis	148
<i>Gale F. Hoffnagle, CCM, QEP, Senior Vice President, and Technical Director, TRC Environmental Corporation; and Pietro Catizone, CCM, QEP, and National Air Practice Lead, Woodard & Curran</i>	
I. Introduction	148
II. National Ambient Air Quality Standards and PSD Increments	149
II.A. Class I, II, and III Areas and PSD Increments	149
II.B. Establishing the Baseline Date	151
II.C. Establishing the Baseline Area	151
II.D. Redefining Baseline Areas	152
II.E. Increment Consumption and Expansion	152
II.F. Baseline Date and Baseline Area: Examples	153
III. Ambient Data Analysis Requirements	153
III.A. Preapplication Air Quality Monitoring	154
III.B. Post-Construction Air Quality Monitoring	155
III.C. Meteorological Data	156
IV. Dispersion Modeling Analysis	157
IV.A. Overview of the Dispersion Model Analysis	157
IV.B. Determining the Impact Area	158
IV.C. Selecting Sources for the PSD and NAAQS Emission Inventories	160
IV.C.1. The NAAQS Inventory	160
IV.C.2. The Increment Inventory	161
IV.D. Model Selection	162
IV.D.1. Meteorological Data	162
IV.D.2. Receptor Network	163
IV.D.3. Dispersion Techniques	163
IV.D.4. Source Data	165
IV.E. Atmospheric Chemistry	167
IV.E.1. Nitrogen Dioxide Modeling	167
IV.E.2. Particulate Matter 2.5	167
IV.E.3. Ozone	167
IV.F. Compliance Demonstration	168
IV.F.1. PSD Compliance	168
IV.F.2. NAAQS Compliance	169
APPENDIX: Air Quality Analysis Checklist	170
Chapter 4: Additional Impact Analysis	179
<i>Gale F. Hoffnagle, CCM, QEP, Senior Vice President, and Technical Director, TRC Environmental Corporation; and Pietro Catizone, CCM, QEP, and National Air Practice Lead, Woodard & Curran</i>	
I. Introduction	179
II. Soils and Vegetation	179
III. Secondary Growth	180
IV. Visibility Impairment Analysis	180
V. Summary	181
Chapter 5: Class I Area Impact Analysis	182
<i>Gale F. Hoffnagle, CCM, QEP, Senior Vice President, and Technical Director, TRC Environmental Corporation; and Pietro Catizone, CCM, QEP, and National Air Practice Lead, Woodard & Curran</i>	
I. Introduction	182
II. Class I Areas	182
III. Class I Area Protections	186
III.A. PSD Increments	186
IV. Air Quality Related Values	187
V. Federal Land Manager	187
VI. Class I Area AQRV Modeling Analysis	187
VI.A. Screening	187
VI.B. Modeling for the PSD Increment	188
VI.C. Modeling for Visibility	188
VI.D. Evaluation of Ozone Impact	189
VI.E. Deposition	189
VII. Class I Area Analysis Review Process	190
Chapter 6: Nonattainment Area Requirements	191
<i>Ken Weiss, PE, BCEE, and Principal Partner, ERM; David Jordan, PE and Partner, ERM; and Gary McCutchen, PE, BCEE, QEP, and Principal, RTP Environmental Associates, Inc.</i>	
I. Introduction	191
II. Definition of Source	192
II.A. Plant-Wide Stationary Source Definition	192
II.B. "Dual Source" Definition of Stationary Source	192
III. Pollutants Eligible for Review, Area Classifications, and Applicability Thresholds	195
III.A. Pollutants Eligible for Review (Geographic Considerations and Attainment Status)	195
III.B. Major Source Threshold	195
III.C. Major Modification Thresholds	195
III.D. Serious and Severe Ozone Nonattainment Areas	195
III.E. Extreme Ozone Nonattainment Areas	198
IV. Nonattainment Applicability Example	198
V. Introduction to Nonattainment Area Requirements	199
VI. Lowest Achievable Emissions Rate	199
VII. Compliance Certification	200

VIII. Emission Reductions “Offsets”	201
VIII.A. Criteria for Evaluating Emissions Offsets	201
VIII.B. Available Sources of Offsets	202
VIII.C. Calculation of Offset Baseline	202
VIII.D. Enforceability of Proposed Offsets	203
IX. Net Air Quality Benefit and Air Quality Analysis	203
X. Alternatives Analysis	203

Chapter 7: Effective Permit Writing 204

*John Evans, J.D., former General Counsel and Chief Deputy Secretary
for the North Carolina Department of Environmental Quality*

I. Introduction	204
II. NSR and Title V Interaction	204
II.A. Merged Permit Process	204
II.B. Non-merged Permit Process	204
III. Legal Authority	205
III.A. General	205
III.B. Specific Citation	206
III.C. Effective Date	206
III.D. Expiration Date	206
III.E. Federal versus Practical Enforceability	207
IV. Compliance Terms	207
IV.A. “Effects-Based” or “Technology” Limits	207
IV.B. Compliance with NSR and Title V Terms and Conditions	208
IV.C. Compliance Methods	208
IV.C.1. Direct Measurement of Emissions	209
IV.C.1.a. CEM Issues	209
IV.C.2.b. Testing at Capacity	210
IV.C.2. Parametric Monitoring	211
IV.C.3. Recordkeeping for Compliance	211
IV.D. Surrogates	212
IV.E. Redundant Conditions	212
IV.F. Incorporation by Reference (IBR)	212
IV.F.1. IBR Application	212
IV.F.2. IBR Federal and State Regulations	212
IV.G. General Conditions	213
IV.G.1. Startup, Shutdown, and Malfunction	213
IV.G.2. Testing Provisions	213
IV.G.3. Renewal and Expiration Dates	213
IV.G.4. Right to Inspect	214
V. Permit Worksheets and File Documentation	214
V.A. Confidential Information	214
V.B. Duty to Respond to Comments	214

Chapter 8: Administration, Appeals and Enforcement 215

Eric L. Hiser, Partner, Jorden Hiser & Joy, PLC

I. Administration and Implementation	215
I.A. Overview of the Major NSR Program Administration	215
I.B. EPA Administration of the Major NSR Programs	216
I.B.1. EPA Program and Regional Office Responsibilities	216
I.B.2. Administrative Measures Used for Policy Control	216
I.B.3. Critical EPA NSR Program Guidance	218
I.B.4. Judicial Review of EPA Program Administration	219
I.C. EPA Direct Administration of the Major NSR Programs	219
I.C.1. EPA PSD Permitting Process	219
I.C.2. EPA NNSR Permits	220
I.D. Cooperative Federalism and the Role of the States and Tribes	220
I.D.1. SIP-Approved Programs	221
I.D.2. Delegated Programs	222
I.D.3. EPA Directly Administered Programs	223
I.D.4. Tribal Programs	223
I.E. Summary of State, Local, and Tribal Program Authorization Status	223
II. State and Local Program Oversight	223
III. NSR Permit Appeals	225
III.A. Appeals Of Federal PSD Permits	225
III.B. Appeals of Federal NNSR permits	226
III.C. Appeals of State, Local, and Tribal PSD and NNSR Permits	226
IV. EPA Title V Objection Authority	226
V. Enforcement Against Individual PSD and NNSR Permittees	227
V.A. EPA Enforcement Authorities	227
V.B. State Enforcement Authorities	229
V.C. Citizen Enforcement Authorities	229
V.D. Agency Enforcement Guidance	230
V.E. Significant Enforcement Initiatives	232
V.F. Administrative Review of Federal Administrative Enforcement Action	232
V.G. Overview of A “Typical” Federal Enforcement Proceeding	234
VI. Judicial Review of EPA, State, and Local NSR Implementation, appeals, and Enforcement	235
VI.A. Structure of the Federal Court System	235

VI.B. Requirements for Seeking Judicial Review	236	II.C.7. Immediate Aftermath of <i>Alabama Power Co. v. Costle</i>	264
VI.B.1. Statutory Right to Review	236	II.D. The 1980 PSD Rules and Litigation	264
VI.B.2. Standing	237	II.D.1. The 1980 PSD Rules	264
VI.B.3. Other Limitations on Judicial Review	238	II.D.2. Challenges to the 1980 Rules	265
VI.C. Scope of Review	238	II.D.3. The 1982 SIP Rule	266
VI.D. Standard of Review	239	II.D.4. PSD and NNSR Changes in the Later 1980s	266
VI.E. Judicial Deference to Agency Interpretations	239	II.E. <i>Wisconsin Electric Power Company</i> and the Clean Air Act Amendments of 1990: Background for NSR Reform	267
VI.F. Effect of Court Decisions	240	II.E.1. EPA's Administrative Decision on Wisconsin Electric Power's Port Washington Project	267
VI.G. State Court Review	241	II.E.2. <i>Wisconsin Electric Power Co. v. Reilly</i>	267
VI.H. Significant Federal Court Decisions	241	II.E.3. The Clean Air Act Amendments of 1990	267
VI.H.1. Program Decisions	241	II.E.4. Offsets and Modification Changes in Nonattainment Areas	268
VI.H.2. Enforcement Decisions	242	II.E.5. Title V Objection Authority	269
VII. Implications of Cooperative Federalism in PSD and NNSR Permitting	243	II.E.6. Initial Rules Implementing the 1990 Amendments	270
		II.E.7. The 1992 Rule	270
Chapter 9: History and Development	245	II.F. NSR Reform and Reconsideration	271
<i>Eric L. Hiser, Partner, Jordan Hiser & Joy, PLC</i>		II.F.1. The 1996 NSR Reform Proposal	271
I. Introduction	245	II.F.2. The 2002 NSR Reform Rule	272
II. History of the Major New Source Review Programs	245	II.F.3. <i>New York v. EPA (New York I)</i>	276
II.A. Early History of Clean Air Regulation in the United States	245	II.F.4. Reasonable Possibility Rule	277
II.A.1. The Air Pollution Control Act and Motor Vehicle Exhaust Study Act	246	II.F.5. The Equipment Replacement Provision and <i>New York II</i>	277
II.A.2. The Clean Air Act of 1963 and Its Aftermath	246	II.F.6. Fugitive Emissions	278
II.B. The 1970 Clean Air Act Amendments, <i>Sierra Club v. Ruckelshaus</i> and the Genesis of Major New Source Review	247	II.F.7. Aggregation, Debottlenecking, and Project Netting Rulemaking	279
II.B.1. The Clean Air Act Amendments of 1970	247	II.F.8. Other 1990 Amendments and NSR Reform Era Rules	280
II.B.2. The 1971 and 1972 Rules	248	II.G. PSD Review of Greenhouse Gas Emissions	280
II.B.3. <i>Sierra Club v. Ruckelshaus</i>	249	II.G.1. The Timing/Triggering Rule	281
II.B.4. EPA's Regulatory Response: The 1972, 1973, and 1974 Rules	250	II.G.2. The Tailoring Rule	281
II.B.5. The 1976 Emission Offset Interpretive Ruling	252	II.G.3. <i>Utility Air Regulatory Group v. EPA (UARG)</i>	282
II.C. The Clean Air Act Amendments of 1977: Ratification and Development of Major Source Preconstruction Review in Parts C and D of the Act	253	II.G.4. Post-UARG GHG Rules	282
II.C.1. The Clean Air Act Amendments of 1977	253	II.G.5. Non-GHG Rules in the GHG Era	282
II.C.2. Act of November 16, 1977 (Clean Air Act Amendments of 1977 Technical Corrections)	255	II.H. NSR in the Trump Era	284
II.C.3. The 1977 Rules	255		
II.C.4. The 1978 Rules	256	Appendix A: Acronyms, Abbreviations, and Symbols	286
II.C.5. 1979 Nonattainment New Source Review Rule	259	Appendix B: Estimating Control Costs	289
II.C.6. <i>Alabama Power Co. v. Costle</i>	261	Appendix C: Index of NSR Documents	296
		Index	393