

TABLE OF CONTENTS

Executive Summary

Table of Contents

Acronyms

| | |
|--|------------|
| Chapter 1: Introduction..... | 1-1 |
| 1.1 National Ambient Air Quality Standards for Particulate Matter..... | 1-1 |
| 1.1.1 EPA’s Standard Setting Process..... | 1-2 |
| 1.1.2 Implementation of PM Standards..... | 1-3 |
| 1.2 2012 PM2.5 Annual Standard..... | 1-3 |
| 1.2.1 Federal Requirements | 1-5 |
| 1.3 Extensive Public Process..... | 1-7 |
| Chapter 2: Air Quality Challenges and Progress..... | 2-1 |
| 2.1 PM2.5 Challenges..... | 2-1 |
| 2.1.1 Nature and Formation of Primary and Secondary PM2.5 | 2-1 |
| 2.2 Air Quality Challenges | 2-3 |
| 2.2.1 Challenges of the Valley’s Natural Environment | 2-3 |
| 2.3 PM2.5 Air Quality Trends..... | 2-11 |
| 2.3.1 Air Monitoring Network..... | 2-11 |
| 2.3.2 PM2.5 Emissions Inventory Trends | 2-13 |
| 2.3.3 Air Quality Progress | 2-16 |
| 2.4 Conclusion | 2-20 |
| Chapter 3: Health Impacts and Health Risk Reduction Strategy..... | 3-1 |
| 3.1 PM2.5 Pollution Defined | 3-1 |
| 3.1.1 PM2.5 Composition in the Valley | 3-1 |
| 3.2 Health Impacts of PM2.5..... | 3-6 |
| 3.3 Health Risk Reduction Strategy | 3-6 |
| 3.3.1 Background of the Health Risk Reduction Strategy | 3-7 |
| 3.4 Toxicity of Chemical Species | 3-11 |
| 3.5 Particle Size and Deposition | 3-17 |
| 3.6 Population Proximity and Intake Fraction..... | 3-20 |
| 3.7 Summary of Health Impacts and Health Risk Reduction Strategy | 3-21 |
| Chapter 4: Attainment Strategy..... | 4-1 |
| 4.1 Comprehensive Control Strategy | 4-1 |
| 4.2 District Control Strategy | 4-2 |
| 4.2.1 Adopted District Regulations | 4-5 |
| 4.2.2 New District Emission Reduction Measures..... | 4-9 |
| 4.2.3 Evaluating Control Measures for New Control Strategy Opportunities | 4-13 |
| 4.2.4 Implementation of Regulatory Measures..... | 4-14 |
| 4.2.5 Areas for Further Study | 4-15 |

| | | |
|-------|--|------|
| 4.3 | CARB Commitment for the San Joaquin Valley | 4-21 |
| 4.3.1 | Overview of Commitment | 4-21 |
| 4.3.2 | Emissions Reductions | 4-23 |
| 4.3.3 | CARB Measures | 4-26 |
| 4.4 | Federal Call for Action | 4-31 |

Chapter 5: Demonstration of Federal Requirements for 2012 Annual PM2.5

| | | |
|-----------------------|--|------|
| Standard | 5-1 | |
| 5.1 | The Valley's Attainment Classification for the 2012 PM2.5 NAAQS | 5-1 |
| 5.2 | Federal Requirements | 5-2 |
| 5.2.1 | Demonstration of Impracticability | 5-2 |
| 5.2.2 | Compliance with the Applicable SIP | 5-3 |
| 5.2.3 | Best Available Control Measures (BACM) and Most Stringent Measures (MSM) | 5-3 |
| 5.2.4 | Attainment Demonstration and Modeling | 5-4 |
| 5.2.5 | Reasonable Further Progress (RFP) | 5-9 |
| 5.2.6 | Quantitative Milestones | 5-9 |
| 5.2.7 | Contingency Measures | 5-10 |
| 5.2.8 | Fulfillment of Serious Area Permitting Requirements | 5-10 |
| 5.2.9 | Transportation Conformity | 5-11 |
| 5.2.10 | Title VI of the Civil Rights Act of 1964 | 5-11 |

Chapter 6: Mobile Source Advocacy and Leveraging New Opportunities

| | | |
|-------|---|-----|
| 6.1 | Importance of Funding | 6-2 |
| 6.1.1 | Need for Mobile Source Emissions Reductions | 6-3 |
| 6.1.2 | Need for Agricultural Burning Alternatives | 6-8 |

Appendices

| | |
|--|------------|
| Appendix A: Ambient PM_{2.5} Data Analysis | A-1 |
| A.1 PM _{2.5} Concentrations – Measurement and Influences | A-1 |
| A.1.1 PM _{2.5} Monitor Types | A-2 |
| A.1.2 Meteorological Influences on PM _{2.5} Concentrations | A-2 |
| A.2 Attainment Demonstration – Design Values | A-11 |
| A.3 Ambient PM _{2.5} Concentration Data Trends | A-25 |
| A.3.1 Days Over the 24-Hour PM _{2.5} Standard of 35 µg/m ³ | A-25 |
| A.3.2 PM _{2.5} Driven Air Quality Index Analysis | A-32 |
| | |
| Appendix B: Emissions Inventory | B-1 |
| B.1 Emissions Inventory Tables | B-2 |
| B.2 Emissions Inventory Background..... | B-27 |
| B.3 Emissions Inventory Overview | B-27 |
| B.3.1 Inventory Base Year..... | B-28 |
| B.3.2 Forecasted Inventories..... | B-30 |
| B.3.3 Temporal Resolution | B-31 |
| B.3.4 Quality Assurance and Quality Control | B-31 |
| B.4 Emission Inventory Components | B-31 |
| B.4.1 Mobile Source Emissions..... | B-31 |
| B.4.2 Off-Road Mobile Source Emissions | B-33 |
| B.4.3 Stationary Point and Stationary Aggregated Sources | B-39 |
| B.4.4 Area-Wide Sources | B-44 |
| B.4.5 Natural Sources | B-50 |
| B.4.6 Point and Areawide Source Emissions Forecasting..... | B-51 |
| B.4.7 External Adjustments | B-58 |
| B.5 Condensable Particulate Matter..... | B-59 |
| B.5.1 Background | B-59 |
| B.5.2 Methodology..... | B-59 |
| | |
| Appendix C: District Control Measure Evaluations | C-1 |
| Overview | C-1 |
| Evaluation Methodology | C-4 |
| Summary of Control Measures..... | C-7 |
| C.1 Rule 4103 (Open Burning)..... | C-8 |
| C.2 Rule 4104 (Reduction of Animal Matter)..... | C-15 |
| C.3 Rule 4106 (Prescribed Burning and Hazard Reduction Burning)..... | C-18 |
| C.4 Rule 4203 (Particulate Matter Emissions from Incineration of Combustible Refuse)..... | C-25 |
| C.5 Rule 4204 (Cotton Gins)..... | C-27 |
| C.6 Rule 4301 (Fuel Burning Equipment) | C-35 |
| C.7 Rule 4306 and 4320 (Boilers, Steam Generators, and Process Heaters, Greater than 5.0 MMBtu/hr)..... | C-37 |
| C.8 Rule 4307 (Boilers, Steam Generators, and Process Heaters - 2.0 MMBtu/hr to 5.0 MMBtu/hr)..... | C-70 |

| | | |
|------|---|-------|
| C.9 | Rule 4308 (Boilers, Steam Generators, and Process Heaters - 0.075 MMBtu/hr to Less than 2.0 MMBtu/hr) | C-86 |
| C.10 | Rule 4309 (Dryers, Dehydrators, and Ovens) | C-102 |
| C.11 | Rule 4311 (Flares) | C-110 |
| C.12 | Rule 4313 (Lime Kilns) | C-118 |
| C.13 | Rule 4352 (Solid Fuel Fired Boilers, Steam Generators, and Process Heaters) | C-120 |
| C.14 | Rule 4354 (Glass Melting Furnaces) | C-129 |
| C.15 | Rule 4550 (Conservation Management Practices) | C-134 |
| C.16 | Rule 4692 (Commercial Charbroiling) | C-146 |
| C.17 | Rule 4702 (Internal Combustion Engines) | C-157 |
| C.18 | Rule 4703 (Stationary Gas Turbines) | C-169 |
| C.19 | Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) | C-186 |
| C.20 | Rule 4902 (Residential Water Heaters) | C-224 |
| C.21 | Rule 4905 (Natural Gas-Fired, Fan-Type Central Furnaces) | C-234 |
| C.22 | Regulation VIII (Fugitive PM10 Prohibitions) | C-242 |
| C.23 | Almond Processing | C-249 |
| C.24 | Rule 9510 (Indirect Source Review) | C-251 |
| C.25 | Emission Inventory Code (EIC) Table | C-254 |

| | |
|--|------------|
| Appendix D: State Control Measure Evaluations | D-1 |
| Executive Summary | D-1 |
| D.1 Section I. Clean Air Act Requirements for Emission Control Measures | D-5 |
| D.2 Section II. Process for Determining MSM | D-8 |
| D.2.1 Step 1: Source Category Emissions of Direct PM2.5 and NOx | D-11 |
| D.2.2 Steps 2 and 3: Identification and Evaluation of Potential MSM Control Measures | D-11 |
| D.2.3 Step 4: Adopt and Implement Feasible Control Measures | D-18 |
| D.3 Section III. Step 1: Emissions of Direct PM2.5 and NOx | D-19 |
| D.4 Section IV. Steps 2 and 3: Identification and Evaluation of Potential Control Measures | D-21 |
| D.4.1 On-Road Light-Duty Vehicles | D-24 |
| D.4.2 On-Road Medium- and Heavy-Duty Vehicles | D-50 |
| D.4.3 Off-Road Sources | D-102 |
| D.4.4 Commercial and Residential Building Appliances | D-158 |
| D.4.5 Summary of Steps 2 and 3 | D-167 |
| D.5 Section V. Step 4: Adoption of Control Measures | D-169 |
| D.6 Section VI. Conclusion: Findings of MSM Analysis | D-170 |
| D.7 Transportation Conformity | D-171 |
| D.7.1 Introduction | D-171 |
| D.7.2 Methodology | D-172 |
| D.7.3 Motor Vehicle Emissions Budget | D-173 |

| | |
|--|------------|
| Appendix E: Incentive-Based Strategy | E-1 |
| E.1 Overview of District's Incentive Program | E-2 |
| E.2 SIP Creditability for Incentive-Based Emissions Reductions | E-2 |

| | | |
|--|---|------------|
| E.3 | Incentive Funding Sources | E-3 |
| E.4 | Incentive Strategy | E-4 |
| E.5 | Current Incentive Programs | E-5 |
| E.5.1 | Heavy Duty Trucks | E-5 |
| E.5.2 | Passenger Cars, Light-Duty Vehicles, Medium-Duty Vehicles | E-7 |
| E.5.3 | Mobile Agricultural Equipment | E-9 |
| E.5.4 | Locomotives | E-11 |
| E.5.5 | School Bus Replacement and Retrofit | E-12 |
| E.5.6 | Alternative Fuel Infrastructure | E-13 |
| E.5.7 | Community-Based Incentive Programs | E-14 |
| E.5.8 | Agricultural Irrigation Pump Engine Replacement Incentive Measure | E-16 |
| E.5.9 | Ag Burn Alternatives Grant Program | E-17 |
| E.5.10 | Residential Wood Combustion | E-18 |
| E.5.11 | Commercial Charbroiling | E-19 |
| E.5.12 | Low-Dust Nut Harvester Grant Program | E-20 |
| E.6 | Technology Advancement | E-21 |
| E.7 | Pilot Projects | E-21 |
| E.7.1 | OK Produce Zero-Emission Heavy-Duty Truck Demonstration Project | E-22 |
| E.7.2 | South-Central Fresno Pepsi Delivery Truck Electrification Project | E-22 |
| E.7.3 | Frito-Lay Zero-Emission and Near Zero-Emission Freight Facility Project | E-22 |
| E.7.4 | San Joaquin Valley I-5 Electric Freight Corridor (Valley EFC) Project | E-23 |
| E.7.5 | Flexible Solutions for Freight Facilities Project | E-23 |
| E.7.6 | San Joaquin Valley Transit Electrification Project | E-24 |
| E.7.7 | San Joaquin Valley Zero-Emission Cargo Handling Demonstration Project | E-24 |
| E.7.8 | The Green On-Road Linen Delivery Project | E-25 |
| E.7.9 | USPS Zero-Emission Delivery Truck Pilot Commercial Deployment Project | E-25 |
| E.7.10 | Valley Air ZEV Mobility Pilot Project | E-25 |
| E.7.11 | Ecosystem of Shared Mobility Services in the San Joaquin Valley | E-26 |
| Appendix F: Precursor Demonstration | | F-1 |
| F.1 | Introduction | F-1 |
| F.2 | U.S. EPA PM _{2.5} Precursor Demonstration Guidance | F-2 |
| F.2.1 | Concentration-Based Analysis | F-2 |
| F.2.2 | Sensitivity-Based Analysis | F-3 |
| F.2.3 | Consideration of Additional Information | F-4 |
| F.3 | Ammonia Analysis | F-4 |
| F.3.1 | Sensitivity-Based Analysis | F-5 |
| F.3.2 | Consideration of Additional Information | F-6 |
| F.3.3 | Conclusion | F-86 |
| F.4 | Sulfur Dioxide Analysis | F-89 |
| F.4.1 | Sensitivity-Based Analysis | F-89 |
| F.4.2 | Consideration of Additional Information | F-90 |
| F.4.3 | Conclusion | F-93 |
| F.5 | Reactive Organic Gas Analysis | F-94 |

| | | |
|--|---|------------|
| F.5.1 | Sensitivity-Based Analysis | F-94 |
| F.5.2 | Consideration of Additional Information | F-95 |
| F.5.3 | Conclusion | F-97 |
| Appendix G: RFP, Quantitative Milestones, and Contingency..... | | G-1 |
| G.1 | Reasonable Further Progress (RFP) | G-1 |
| G.1.1 | RFP Plan Requirements | G-1 |
| G.1.2 | Determination of RFP Years | G-2 |
| G.1.3 | RFP Milestone Requirement Targets and Attainment Demonstrations | G-2 |
| G.1.4 | RFP Calculation Methodology and Generally Linear RFP Targets | G-3 |
| G.2 | Quantitative Milestones..... | G-7 |
| G.2.1 | Quantitative Milestone Requirements | G-7 |
| G.2.2 | Stationary Sources Quantitative Milestone Commitments | G-7 |
| G.2.3 | Mobile Sources Quantitative Milestone Commitments | G-8 |
| G.3 | Contingency Measures | G-9 |
| G.3.1 | EPA Draft Guidance for Contingency Measures | G-11 |
| G.3.2 | Contingency Measure Emission Reduction Targets..... | G-11 |
| G.3.3 | Adopted Contingency Measures for the 2012 Annual PM2.5 Standard | G-13 |
| G.3.4 | Reasoned Justification Approach..... | G-20 |
| G.3.5 | Contingency Emission Reductions..... | G-48 |
| G.3.6 | Federal Contingency Measure Opportunities | G-48 |
| G.3.7 | Conclusion | G-50 |
| Appendix H: New Source Review and Emissions Reduction Credits | | H-1 |
| H.1 | Introduction..... | H-1 |
| H.2 | Pre-Baseline Emission Reduction Credits | H-1 |
| Appendix I: Modeling Emission Inventory | | I-1 |
| I. | Acronyms..... | I-1 |
| II. | Development of PM2.5 Emissions Inventories..... | I-1 |
| A. | Inventory Coordination | I-1 |
| B. | Background | I-1 |
| C. | Inventory Years | I-2 |
| D. | Spatial Extent of Emission Inventories | I-3 |
| III. | Estimation of Base Year Modeling Inventory | I-6 |
| A. | Terminology | I-6 |
| B. | Emissions Inventory | I-7 |
| C. | Temporal Distribution of Emissions..... | I-8 |
| D. | Spatial Allocation..... | I-16 |
| E. | Speciation Profiles | I-18 |
| IV. | Methodology for Developing Base Case, Baseline, and Future Projected Emissions Inventories | I-20 |
| A. | Estimation of Gridded Area and Point sources..... | I-20 |
| B. | Estimation of On-road Motor Vehicle Emissions | I-22 |
| C. | Estimation of Gridded Biogenic Emissions..... | I-27 |
| D. | Aircraft Emissions | I-28 |

| | | |
|-------|--|------|
| E. | Estimation of Ocean-going Vessel (OGV) Emissions..... | I-28 |
| F. | Estimation of Other Day-specific Sources..... | I-28 |
| G. | Northern Mexico Emissions..... | I-32 |
| H. | Western States Emissions..... | I-36 |
| I. | Application of Control Measure Reduction Factors..... | I-37 |
| V. | Quality Assurance of Modeling Inventories..... | I-37 |
| A. | Area and Point Sources..... | I-38 |
| B. | On-road Emissions..... | I-40 |
| C. | Aircraft Emissions..... | I-40 |
| D. | Day-specific Sources..... | I-40 |
| E. | Additional Quality Assurance..... | I-41 |
| F. | Model-ready Files Quality Assurance..... | I-44 |
| VI. | Bibliography..... | I-46 |
| VII. | Appendix A: Day-of-week Redistribution Factors by Vehicle Type and County..... | I-50 |
| VIII. | Appendix B: Hour-of-day Profiles by Vehicle Type and County..... | I-53 |
| IX. | Appendix C: Additional Temporal Profiles..... | I-74 |
| X. | Appendix D: Spatial Surrogate Assignments..... | I-79 |
| XI. | Appendix E: San Joaquin Valley Facilities with CEM data..... | I-90 |

Appendix J: Modeling Attainment Demonstration and Modeling Protocol.....J-1

| | | |
|------|--|------|
| I. | Introduction..... | J-11 |
| A. | Ambient PM _{2.5} Monitors in the SJV..... | J-11 |
| B. | PM _{2.5} Air Quality Trends..... | J-15 |
| C. | Major PM _{2.5} Chemical Components..... | J-21 |
| D. | Seasonality of PM _{2.5} and Meteorological Conditions Leading to Elevated PM _{2.5} | J-23 |
| II. | Approaches..... | J-24 |
| A. | Methodology..... | J-25 |
| B. | Modeling Period..... | J-25 |
| C. | Baseline Design Values..... | J-25 |
| D. | Base, Reference, and Future Years..... | J-27 |
| E. | PM _{2.5} Species Calculations..... | J-28 |
| F. | Future Year Design Values..... | J-31 |
| III. | Meteorological Modeling..... | J-32 |
| A. | WRF Model Setup..... | J-33 |
| B. | WRF Model Results and Evaluation..... | J-35 |
| C. | Phenomenological Evaluation..... | J-51 |
| IV. | Emissions..... | J-54 |
| V. | PM _{2.5} Modeling..... | J-59 |
| A. | CMAQ Model Setup..... | J-59 |
| B. | CMAQ Model Evaluation..... | J-61 |
| C. | Future Year 2030 Design Values..... | J-71 |
| D. | PM _{2.5} Precursor Sensitivity Analysis..... | J-75 |
| E. | Unmonitored Area Analysis..... | J-81 |
| F. | Discussions on the Impact from Different Soil NO _x Parameterizations and Increasing Prescribed Burn Emissions..... | J-82 |

VI. References J-88
VII. Supplemental Materials J-94

Appendix K: Comments and ResponsesK-1

Attachment A: Local Transportation Control Measure Review and Most Stringent Measures Analysis

TABLE OF FIGURES

| | |
|---|------|
| Figure 2-1 San Joaquin Valley Air Basin | 2-3 |
| Figure 2-2 Atmosphere with Temperature Inversion | 2-4 |
| Figure 2-3 (a-c) Drought Extent and Severity in California | 2-10 |
| Figure 2-4 Valley Air Monitoring Sites | 2-12 |
| Figure 2-5 Valley PM2.5 Winter Emissions Inventory Trend | 2-15 |
| Figure 2-6 Valley NOx Winter Emissions Inventory Trend | 2-16 |
| Figure 2-7 Valley 24-hour PM2.5 Design Value Trend | 2-18 |
| Figure 2-8 Valley Annual PM2.5 Design Value Trend | 2-18 |
| Figure 2-9 Number of Days Valley Exceeded the 24-hour 35 µg/m ³ Standard | 2-19 |
| Figure 2-10 Progress in Reducing Days Exceeding 24-hour PM2.5 Standard..... | 2-19 |
| Figure 2-11 Seasonal Average Stability and PM2.5 Concentrations..... | 2-20 |
| | |
| Figure 3-1 Comparison of PM10, PM2.5, Human Hair, and Fine Beach Sand..... | 3-1 |
| Figure 3-2 Modesto PM2.5 Speciation | 3-4 |
| Figure 3-3 Fresno PM2.5 Speciation..... | 3-4 |
| Figure 3-4 Visalia PM2.5 Speciation | 3-5 |
| Figure 3-5 Bakersfield PM2.5 Speciation | 3-5 |
| Figure 3-6 Valley-wide Average Ammonium Nitrate..... | 3-15 |
| Figure 3-7 Biological Pathways whereby PM2.5 Promotes Cardiovascular Events .. | 3-19 |
| Figure 3-8 Simplified Intake Fraction Model | 3-20 |
| | |
| Figure 4-1 Rule Development Process..... | 4-14 |
| | |
| Figure 6-1 Major Reductions in Air Pollution | 6-3 |
| Figure 6-2 Jurisdiction Comparison of Statewide Mobile Source Emissions | 6-5 |
| Figure 6-3 Trend of Agricultural Burning Activity | 6-9 |
| | |
| Figure A-1 (a-c) Drought Extent and Severity in California..... | A-4 |
| Figure A-2 Winter Season Average Stability and PM2.5 Concentrations | A-7 |
| Figure A-3 San Joaquin County 24-Hour Design Value Trend..... | A-17 |
| Figure A-4 San Joaquin County Annual Design Value Trend..... | A-17 |
| Figure A-5 Stanislaus County 24-Hour Design Value Trend | A-18 |
| Figure A-6 Stanislaus County Annual Design Value Trend | A-18 |
| Figure A-7 Merced County 24-Hour Design Value Trend..... | A-19 |
| Figure A-8 Merced County Annual Design Value Trend..... | A-19 |
| Figure A-9 Madera County 24-Hour Design Value Trend..... | A-20 |
| Figure A-10 Madera County Annual Design Value Trend | A-20 |
| Figure A-11 Fresno County 24-Hour Design Value Trend..... | A-21 |
| Figure A-12 Fresno County Annual Design Value Trend | A-21 |
| Figure A-13 Kings County 24-Hour Design Value Trend..... | A-22 |
| Figure A-14 Kings County Annual Design Value Trend..... | A-22 |
| Figure A-15 Tulare County 24-Hour Design Value Trend..... | A-23 |
| Figure A-16 Tulare County Annual Design Value Trend | A-23 |
| Figure A-17 Kern County 24-Hour Design Value Trend | A-24 |

| | | |
|-------------|---|-------|
| Figure A-18 | Kern County Annual Design Value Trend | A-24 |
| Figure A-19 | Number of Days Valley Exceeded the 24-hour 35 µg/m ³ Standard | A-26 |
| Figure A-20 | San Joaquin County - Days Over the 24-hour 35 µg/m ³ Standard | A-27 |
| Figure A-21 | Stanislaus County - Days Over the 24-hour 35 µg/m ³ Standard | A-27 |
| Figure A-22 | Merced County - Days Over the 24-hour 35 µg/m ³ Standard | A-28 |
| Figure A-23 | Madera County - Days Over the 24-hour 35 µg/m ³ Standard | A-28 |
| Figure A-24 | Fresno County - Days Over the 24-hour 35 µg/m ³ Standard | A-29 |
| Figure A-25 | Kings County - Days Over the 24-hour 35 µg/m ³ Standard | A-29 |
| Figure A-26 | Tulare County - Days Over the 24-hour 35 µg/m ³ Standard | A-30 |
| Figure A-27 | Kern County - Days Over the 24-hour 35 µg/m ³ Standard | A-30 |
| Figure A-28 | Air Quality Index (AQI) Categories | A-33 |
| Figure A-29 | San Joaquin County PM2.5 AQI Trend | A-35 |
| Figure A-30 | Stanislaus County PM2.5 AQI Trend | A-35 |
| Figure A-31 | Merced County PM2.5 AQI Trend | A-36 |
| Figure A-32 | Madera County PM2.5 AQI Trend | A-36 |
| Figure A-33 | Fresno County PM2.5 AQI Trend | A-37 |
| Figure A-34 | Kings County PM2.5 AQI Trend | A-37 |
| Figure A-35 | Tulare County PM2.5 AQI Trend | A-38 |
| Figure A-36 | Kern County PM2.5 AQI Trend | A-38 |
| Figure A-37 | Basin-Day AQI Frequencies during the Winter Season | A-39 |
| Figure A-38 | Percent AQI Days in San Joaquin County 2002 | A-40 |
| Figure A-39 | Percent AQI Days in San Joaquin County 2023 | A-40 |
| Figure A-40 | Percent AQI Days in Fresno County 2002 | A-41 |
| Figure A-41 | Percent AQI Days in Fresno County 2023 | A-41 |
| Figure A-42 | Percent AQI Days in Kern County 2002 | A-42 |
| Figure A-43 | Percent AQI Days in Kern County 2023 | A-42 |
| Figure A-44 | Progress in Reducing Days Exceeding 24-hour PM2.5 Standard | A-43 |
| | | |
| Figure C-1 | Trend of Agricultural Burning Activity | C-10 |
| Figure C-2 | Figure Smoke Management System Burn Allocation Zones | C-11 |
| Figure C-3 | Per Capita Income (in 2021 dollars), 2017-2021 for Cities and Counties with Building Electrification Ordinances | C-231 |
| Figure C-4 | Per Capita Income (in 2021 dollars), 2017-2021 for San Joaquin Valley APCD and Bay Area AQMD Counties | C-232 |
| Figure C-5 | Per Capita Income (in 2021 dollars), 2017-2021 for Cities and Counties with Building Electrification Ordinances | C-239 |
| Figure C-6 | Per Capita Income (in 2021 dollars), 2017-2021 for San Joaquin Valley APCD and Bay Area AQMD Counties | C-240 |
| | | |
| Figure D-1 | Transition from Combustion | D-2 |
| Figure D-2 | Process for Determining MSM | D-8 |
| Figure D-3 | Light-Duty Control Measures | D-25 |
| Figure D-4 | Heavy-Duty Control Measures | D-51 |
| Figure D-5 | Off-Road Control Measures | D-103 |

| | | |
|------------|---|------|
| Figure F-1 | NO _x and ammonia emission trends in the San Joaquin Valley between 2017 and 2030 | F-7 |
| Figure F-2 | Excess ammonia (NH ₃) in the San Joaquin Valley on Jan 18 (Left) and Jan 20 (Right) based on NASA aircraft measurements in 2013 | F-8 |
| Figure F-3 | Maps of annual average ammonia from CMAQ (Model; left), IASI (Satellite; middle), and the percentage difference (DU, 1 DU = 2.69e16 molecules/cm ²) | F-9 |
| Figure F-4 | Sources of Ammonia in the San Joaquin Valley (2030)..... | F-13 |
| Figure F-5 | Ammonia from CAFs in the San Joaquin Valley (2030)..... | F-14 |
| Figure F-6 | Ammonia from Dairy Cattle in the San Joaquin Valley (2030)..... | F-15 |
| Figure F-7 | Ammonia from Dairy Cattle in the San Joaquin Valley (cont.) (2030)..... | F-16 |
| Figure F-8 | SO _x emission trend in the San Joaquin Valley between 2017 and 2030 | F-91 |
| Figure F-9 | ROG emission trend in the San Joaquin Valley between 2017 and 2030 | F-96 |
| Figure G-1 | Public Process of Rule Development and Implementation..... | G-3 |
| Figure G-2 | Adopted Contingency Measure – Residential Wood Burning..... | G-16 |
| Figure I-1 | Spatial coverage of emissions grid with nonattainment area highlighted in yellow..... | I-4 |
| Figure I-2 | San Joaquin Valley PM _{2.5} Nonattainment area highlighted in California with statewide 4 km grid overlaid | I-5 |
| Figure I-3 | Workflow for spatial and temporal allocation of on-road emissions..... | I-27 |
| Figure I-4 | Outline of Mexico municipalities included in California air quality simulations | I-33 |
| Figure I-5 | Example of an ROG spatial plot by source category (Consumer Products) | I-39 |
| Figure I-6 | Comparison of inventories report..... | I-42 |
| Figure I-7 | Daily variation of NO _x emission sources in San Joaquin Valley Air Basin in 2017 | I-43 |
| Figure I-8 | Annual processed emissions example for 2017 San Joaquin Valley Air Basin PM 2.5 for selected sectors | I-44 |
| Figure I-9 | Example timeseries plot for daily 2017 PM 2.5 emissions from selected sectors for San Joaquin Valley Air Basin..... | I-45 |
| Figure J-1 | Map of the ambient PM _{2.5} monitoring network (including monitors for PM _{2.5} mass only or PM _{2.5} mass and speciation) in the San Joaquin Valley | J-12 |
| Figure J-2 | Trends in valley-wide annual average, 24-hour 98 th percentile PM _{2.5} , and approximate number of days above the 24-hour standard | J-20 |
| Figure J-3 | San Joaquin Valley trends in PM _{2.5} , NO _x , and ROG emissions | J-20 |
| Figure J-4 | Five-year average (2015-2019) and average peak day (top 10 percent over the same five years) PM _{2.5} compositions at Bakersfield, Fresno, and Modesto..... | J-22 |
| Figure J-5 | 24-hour PM _{2.5} concentrations at Bakersfield-California Avenue in 2017.. | J-23 |
| Figure J-6 | WRF modeling domains (D01 36 km; D02 12 km; and D03 4 km)..... | J-33 |

| | | |
|-------------|--|------|
| Figure J-7 | Meteorological observation sites in San Joaquin Valley. The numbers correspond to the sites listed in Table 12 | J-37 |
| Figure J-8 | Distribution of model daily mean bias for Modesto, Fresno, Visalia, Bakersfield and SJV. Results are shown for wind speed (top), temperature (middle), and Relative Humidity (bottom) | J-47 |
| Figure J-9 | Distribution of model daily mean error for Modesto, Fresno, Visalia, Bakersfield and SJV. Results are shown for wind speed (top), temperature (middle), and Relative Humidity (bottom) | J-48 |
| Figure J-10 | Comparison of modeled and observed hourly wind speed (left column), 2-meter temperature (middle column), and relative humidity (right column). Results for Modesto are shown in the top row, Fresno in the middle row, and Visalia in the bottom row | J-49 |
| Figure J-11 | Comparison of modeled and observed hourly wind speed (left column), 2-meter temperature (middle column), and relative humidity (right column). Results for Bakersfield are shown in the top row and SJV in the bottom row | J-50 |
| Figure J-12 | Surface wind field at 13:00 PST December 28, 2017 | J-52 |
| Figure J-13 | Surface wind field at 14:00 PST December 28, 2017 | J-53 |
| Figure J-14 | Surface wind field at 20:00 PST December 28, 2017 | J-54 |
| Figure J-15 | Monthly average biogenic ROG emissions for 2017 | J-58 |
| Figure J-16 | Monthly average soil NOx emissions for 2017 | J-58 |
| Figure J-17 | CMAQ modeling domains utilized in the modeling assessment | J-60 |
| Figure J-18 | Bugle plot of quarterly PM _{2.5} model performance in terms of MFB and MFE at the four PM _{2.5} speciation sites in the SJV (i.e., Bakersfield, Fresno, Modesto, and Visalia)..... | J-68 |
| Figure J-19 | Comparison of annual PM _{2.5} model performance to other modeling studies in Simon et al. (2012). Red symbols represent performance at the four PM _{2.5} speciation sites in the SJV..... | J-69 |
| Figure J-20 | Spatial distribution of projected 2030 annual PM _{2.5} DVs (left) and RRFs based on the unmonitored area analysis within the SJV nonattainment area | J-82 |
| Figure J-21 | Daily soil NOx emissions for each month of 2017 estimated from the MEGAN3.0 default soil NOx scheme and the MEGAN BDSNP soil NOx scheme | J-84 |
| Figure J-22 | Locations of prescribed burning events for 2017, 2018, 2019, and 2021 | J-86 |

TABLE OF TABLES

| | | |
|-----------|---|------|
| Table 1-1 | 2012 PM _{2.5} NAAQS and Associated Actions | 1-4 |
| Table 1-2 | Statutory Requirements..... | 1-5 |
| Table 1-3 | <i>2024 PM_{2.5} Plan</i> Public Process | 1-8 |
| Table 2-1 | Estimated Valley County and State Populations, 2020-2035 | 2-5 |
| Table 2-2 | Rainfall Totals for Select Cities Across California | 2-9 |
| Table 2-3 | PM _{2.5} Monitoring Site Types in 2023 | 2-13 |
| Table 3-1 | Summaries of PM _{2.5} Components | 3-3 |
| Table 4-1 | San Joaquin Valley Baseline Stationary and Area Source Emissions..... | 4-3 |
| Table 4-2 | District Control Strategy Measures and Schedule..... | 4-4 |
| Table 4-3 | Emission Reductions from Control Strategy..... | 4-4 |
| Table 4-4 | 2022 State SIP Strategy Measures and Schedule | 4-22 |
| Table 4-5 | San Joaquin Valley Baseline Mobile Source Emissions..... | 4-23 |
| Table 4-6 | 2030 San Joaquin Valley Emissions Reductions from CARB Programs... | 4-24 |
| Table 4-7 | San Joaquin Valley Expected Emissions Reductions from 2016 and 2022 State SIP Strategy Recently Adopted Measures | 4-25 |
| Table 4-8 | San Joaquin Valley Reductions from Remaining 2016 State SIP Strategy Measures | 4-26 |
| Table 4-9 | San Joaquin Valley Expected Emissions Reductions from the Remaining 2022 State SIP Strategy Measures..... | 4-26 |
| Table 5-1 | Summary of Serious Nonattainment Area Plan Requirements..... | 5-2 |
| Table 5-2 | SJV Model-Ready Annual Emissions for 2017, 2030 (baseline), and 2030 (attainment)..... | 5-6 |
| Table 5-3 | 2017 baseline and projected 2030 future year annual PM _{2.5} DVs at each monitor..... | 5-8 |
| Table A-1 | Rainfall Totals for Select Cities across California | A-6 |
| Table A-2 | Number of Acres Burned by Wildfires in California..... | A-8 |
| Table A-3 | General PM _{2.5} Design Value Calculation Methods | A-11 |
| Table A-4 | Single Year 24-hour Average PM _{2.5} 98th Percentile Values (µg/m ³)..... | A-13 |
| Table A-5 | 24-hour Average PM _{2.5} Design Values (Three-Year Averages, µg/m ³)... | A-14 |
| Table A-6 | Single Year Annual Mean PM _{2.5} Concentrations (µg/m ³) | A-15 |
| Table A-7 | Annual PM _{2.5} Design Values (Three-Year Averages, µg/m ³) | A-16 |
| Table A-8 | Number of Days Valley Exceeded 35 µg/m ³ PM _{2.5} Standard | A-32 |
| Table A-9 | PM _{2.5} AQI Scale | A-32 |
| Table B-1 | Directly Emitted PM _{2.5} | B-2 |
| Table B-2 | NO _x | B-7 |
| Table B-3 | SO _x | B-12 |
| Table B-4 | VOC..... | B-17 |
| Table B-5 | Ammonia..... | B-22 |

| | | |
|------------|---|-------|
| Table B-6 | Growth Surrogates for Point and Areawide Sources | B-52 |
| Table B-7 | District and CARB Control Rules and Regulations Included in the Inventory for Stationary Sources | B-55 |
| Table B-8 | External Adjustment IDs and Descriptions..... | B-58 |
| Table C-1 | District Control Measures Evaluated for MSM..... | C-7 |
| Table C-2 | Typical Applications of Control Technologies | C-55 |
| Table C-3 | Rule 4352 NO _x , CO, PM ₁₀ , and SO _x Emission Limits..... | C-121 |
| Table C-4 | NO _x Cost Effectiveness Analysis for Units fired on MSW | C-127 |
| Table C-5 | NO _x Cost Effectiveness Analysis for Units fired on Biomass..... | C-127 |
| Table C-6 | Direct Costs | C-153 |
| Table C-7 | Direct Installation Costs | C-153 |
| Table C-8 | Indirect Costs..... | C-153 |
| Table C-9 | Other Costs | C-153 |
| Table C-10 | Total Capital Investment..... | C-154 |
| Table C-11 | Cost Effectiveness Analysis for Underfired Charbroiler Controls..... | C-154 |
| Table C-12 | District Contingency Curtailment Thresholds..... | C-188 |
| Table D-1 | Stringency of Control Measures Required | D-6 |
| Table D-2 | MSM Requirements | D-10 |
| Table D-3 | Implementation and Timing Requirements for MSM..... | D-16 |
| Table D-4 | NO _x Emissions (tpd) from Mobile Sources in the Valley | D-19 |
| Table D-5 | Direct PM _{2.5} Emissions (tpd) from Mobile Sources in the Valley | D-19 |
| Table D-6 | NO _x and Direct PM _{2.5} Emissions (tpd) from Space and Water Heaters in the Valley | D-20 |
| Table D-7 | Comparison of Stringency – Light-Duty Measures CARB Control Programs Compared to Federal Standards and Control Programs in Other States and Nonattainment Areas | D-36 |
| Table D-8 | ACC I Section 177 States: LD Emission Standards and ZEV Regulation | D-41 |
| Table D-9 | Boutique Gasoline Fuel Programs in the U.S. | D-45 |
| Table D-10 | Light-Duty Control Measures Stringency and Timeline for Implementation..... | D-47 |
| Table D-11 | Adopted California and Federal Heavy-Duty Engine Emission Standards (for compression-ignition engines, shown in g/bhp-hr)..... | D-53 |
| Table D-12 | Useful Life Periods | D-58 |
| Table D-13 | Warranty Periods..... | D-58 |
| Table D-14 | Allowable Levels of Smoke Opacity..... | D-61 |
| Table D-15 | ZEB Purchase Schedule (ZEB Percentage of Total New Bus Purchases)..... | D-70 |
| Table D-16 | Zero-Emission Airport Shuttle Regulation Requirements | D-71 |
| Table D-17 | Comparison of Stringency – Heavy-Duty Measures CARB Control Programs Compared to Federal Standards and Control Programs in Other States and Nonattainment Areas | D-74 |
| Table D-18 | Medium- and Heavy-Duty Control Measures – Stringency and Timeline for Implementation..... | D-95 |
| Table D-19 | Phase-in of Off-Road Engine Standards..... | D-103 |

| | | |
|------------|---|-------|
| Table D-20 | Comparison of Stringency – Off-Road Measures CARB Control Programs Compared to Federal Standards and Control Programs in Other States and Nonattainment Areas | D-128 |
| Table D-21 | Off-Road Control Measures – Stringency and Timeline for Implementation | D-151 |
| Table D-22 | Comparison of Stringency – Commercial and Residential Building Appliances CARB Control Program Compared to Federal Standards and Control Programs in Other States | D-161 |
| Table D-23 | Commercial and Residential Building Appliances Control Measures – Stringency and Timeline for Implementation | D-165 |
| Table D-24 | Summary MVEB for the 2024 San Joaquin Valley Plan for each MPO within the San Joaquin Valley Region (tons per day) | D-174 |
| Table D-25 | MVEB for the 2024 San Joaquin Valley Plan (Annual Season) for 2025 | D-175 |
| Table D-26 | MVEB the 2024 San Joaquin Valley Plan (Annual Season) for 2028 | D-177 |
| Table D-27 | MVEB for the 2024 San Joaquin Valley Plan (Annual Season) for 2030 | D-179 |
| Table D-28 | MVEB for the San Joaquin Valley Plan (Annual Season) for 2031 | D-181 |
| Table E-1 | Summary of Grant Expenditures and Results | E-2 |
| Table F-1 | Contribution of Ammonia, SO ₂ , and VOCs to Total PM _{2.5} | F-2 |
| Table F-2 | Base Year 2017 PM _{2.5} – 30 Percent Ammonia Reduction | F-5 |
| Table F-3 | Base Year 2017 PM _{2.5} – 70 Percent Ammonia Reduction | F-5 |
| Table F-4 | Future Year 2030 PM _{2.5} – 30 Percent Ammonia Reduction | F-10 |
| Table F-5 | Future Year 2030 PM _{2.5} – 70 Percent Ammonia Reduction | F-11 |
| Table F-6 | CAF Emission Reduction Analysis | F-14 |
| Table F-7 | Dairy Cattle Emission Reductions Analysis | F-14 |
| Table F-8 | Inventory of Confined Animal Facilities in the Valley (2030) | F-17 |
| Table F-9 | Nutrition and Feed Management Measures Evaluated | F-22 |
| Table F-10 | Animal Confinement Measures Evaluated | F-34 |
| Table F-11 | Manure Management (Storage) Measures Evaluated | F-45 |
| Table F-12 | Land Application of Manure Measures Evaluated | F-64 |
| Table F-13 | Other Mitigation Measures Evaluated | F-75 |
| Table F-14 | Fertilizer Mitigation Measures Evaluated | F-80 |
| Table F-15 | Estimated Feasible Emission Reductions | F-88 |
| Table F-16 | Base Year 2017 PM _{2.5} – 30 Percent SO _x Reduction | F-89 |
| Table F-17 | Base Year 2017 PM _{2.5} – 70 Percent SO _x Reduction | F-90 |
| Table F-18 | Future Year 2030 PM _{2.5} – 30 Percent SO _x Reduction | F-92 |
| Table F-19 | Future Year 2030 PM _{2.5} – 70 Percent SO _x Reduction | F-92 |
| Table F-20 | Base Year 2017 PM _{2.5} – 30 Percent ROG Reduction | F-94 |
| Table F-21 | Base Year 2017 PM _{2.5} – 70 Percent ROG Reduction | F-95 |
| Table F-22 | Future Year 2030 PM _{2.5} – 30 Percent ROG Reduction | F-96 |
| Table F-23 | Future Year 2030 PM _{2.5} – 70 Percent ROG Reduction | F-97 |

| | | |
|------------|--|------|
| Table G-1 | Summary of Significant RFP and Quantitative Milestone Dates..... | G-2 |
| Table G-2 | Annual Average Emission Inventory (tpd) | G-3 |
| Table G-3 | Annual Average Emissions Reductions from Measures Not Yet Included in the Baseline and Control Measure Commitments (tpd)..... | G-3 |
| Table G-4 | Projected Attainment Emissions Inventory after Control Measures (tpd) .. | G-4 |
| Table G-5 | Total Reductions Necessary to Reach Attainment (tpd)..... | G-4 |
| Table G-6 | Milestone Year Fractions Achieved in Each Milestone Year | G-4 |
| Table G-7 | Linear RFP Levels (tpd)..... | G-5 |
| Table G-8 | Comparison of Linear RFP Levels to Projected Attainment Emissions Inventory..... | G-5 |
| Table G-9 | Generally Linear RFP Targets..... | G-6 |
| Table G-10 | Quantitative Milestone Dates and Deadlines..... | G-7 |
| Table G-11 | Contingency Measure Reductions Needed under OYW _P Approach..... | G-12 |
| Table G-12 | District Contingency Curtailment Thresholds..... | G-16 |
| Table G-13 | Additional Curtailments by Contingency Trigger (Days)..... | G-17 |
| Table G-14 | Annual Average Emission Reductions by Proposed Contingency Trigger (tpd)..... | G-18 |
| Table G-15 | District CEPAM v1.00 Annual Average Inventories for 2030..... | G-21 |
| Table G-16 | Fuel Combustion Inventory Contributions..... | G-24 |
| Table G-17 | Waste Disposal Inventory Contributions..... | G-34 |
| Table G-18 | Petroleum Production and Marketing Inventory Contributions..... | G-36 |
| Table G-19 | Industrial Processes Inventory Contributions | G-37 |
| Table G-20 | Miscellaneous Processes Inventory Contributions | G-41 |
| Table G-21 | On-Road Mobile Vehicles Inventory Contributions | G-45 |
| Table G-22 | Other Mobile Sources Inventory Contributions | G-45 |
| Table G-23 | Reduction Targets and Selected Measures Emission Reductions | G-48 |
| Table G-24 | Reduction Targets and Selected Measures Emission Reductions for Sources under District and CARB Regulatory Jurisdiction..... | G-48 |
| | | |
| Table H-1 | Total Expected ERC Usage, 2017-2030..... | H-4 |
| Table H-2 | Estimated PM _{2.5} Growth, Control, and Estimated Offset Use..... | H-6 |
| Table H-3 | Estimated NO _x Growth, Control, and Estimated Offset Use..... | H-8 |
| Table H-4 | Estimated SO _x Growth, Control, and Estimated Offset Use | H-10 |
| Table H-5 | Estimated VOC Growth, Control, and Estimated Offset Use | H-12 |
| Table H-6 | List of Emission Reduction Credits PM ₁₀ and PM _{2.5} Precursors | H-14 |
| | | |
| Table I-1 | Modeling domain parameters..... | I-6 |
| Table I-2 | Inventory terms for emission source types..... | I-7 |
| Table I-3 | Day of week variation factors | I-8 |
| Table I-4 | Daily variation factors | I-11 |
| Table I-5 | Network information for data sources used in current version of ITN..... | I-23 |
| Table I-6 | Registration data vehicle type classes | I-24 |
| Table I-7 | Vehicle classification and type of adjustment..... | I-25 |
| Table I-8 | List indicating ERG developed spatial surrogates for the state of Baja California | I-34 |
| Table I-9 | List of EPA's Mexico surrogates with vintage of May 2018 | I-35 |

| | | |
|------------|--|------|
| Table I-10 | Day-of-week adjustment for LD and LM vehicle class by county | I-50 |
| Table I-11 | Day-of-week adjustment for July 1 st to 7 th for HH vehicle class by county | I-52 |
| Table I-12 | Hour-of-day profiles for LD and LM vehicle classes for Counties C10 – C20 | I-53 |
| Table I-13 | Hour-of-day profiles for LD and LM vehicle classes for Counties C24 – C50 | I-60 |
| Table I-14 | Hour-of-day profiles excerpt from July 1 st to 7 th for HH vehicle class by county..... | I-67 |
| Table I-15 | OGV monthly profiles | I-75 |
| Table I-16 | OGV weekly profiles..... | I-76 |
| Table I-17 | Consumer products diurnal profile assignment codes and descriptions.... | I-77 |
| Table I-18 | Consumer products hourly temporal profiles..... | I-77 |
| Table I-19 | Primary surrogate assignment at the EICSUM level, description, and data source..... | I-79 |
| Table I-20 | San Joaquin Valley facilities with Continuous Emissions Monitoring | I-90 |
| Table J-1 | 2015-2019 San Joaquin Valley PM _{2.5} Monitoring Sites* | J-13 |
| Table J-2 | Annual Average PM _{2.5} (µg/m ³) | J-16 |
| Table J-3 | Annual PM _{2.5} Design Value (three-year average, µg/m ³) | J-17 |
| Table J-4 | Annual 98 th percentile of the 24-hour PM _{2.5} (µg/m ³)..... | J-18 |
| Table J-5 | 24-hour PM _{2.5} Design Values (three-year average, µg/m ³) | J-19 |
| Table J-6 | Illustrates the data from each year that is utilized in the baseline DV calculation..... | J-26 |
| Table J-7 | Average baseline DV for each monitoring site in the SJV, as well as the yearly annual DVs from 2017-2019 utilized in calculating the baseline DVs* | J-27 |
| Table J-8 | Description of CMAQ model simulations used to evaluate model performance and project baseline design values to the future years | J-28 |
| Table J-9 | PM _{2.5} speciation data used for each PM _{2.5} design site | J-29 |
| Table J-10 | WRF vertical layer structure | J-34 |
| Table J-11 | WRF Physics options | J-35 |
| Table J-12 | Meteorological monitor location and parameter(s) measured. Sites are shown in Figure 7 | J-38 |
| Table J-13 | Hourly surface wind speed (m/s), temperature (K) and relative humidity statistics (%) in Modesto..... | J-42 |
| Table J-14 | Hourly surface wind speed (m/s), temperature (K) and relative humidity (%) statistics in Fresno..... | J-43 |
| Table J-15 | Hourly surface wind speed (m/s), temperature (K) and relative humidity (%) statistics in Visalia | J-44 |
| Table J-16 | Hourly surface wind speed (m/s), temperature (K) and relative humidity (%) statistics in Bakersfield (No wind data available for the 4 th quarter) | J-45 |
| Table J-17 | Hourly surface wind speed (m/s), temperature (K) and relative humidity (%) statistics in the San Joaquin Valley | J-46 |
| Table J-18 | SJV Model-Ready Annual Emissions for 2017, 2030 (baseline), and 2030 (attainment)*..... | J-56 |

| | | |
|------------|---|------|
| Table J-19 | Additional NO _x and PM _{2.5} emission reductions (tons/day) implemented in the 2030 attainment inventories* | J-57 |
| Table J-20 | CMAQ configuration and settings | J-61 |
| Table J-21 | Quarterly PM _{2.5} model performance based on PM _{2.5} speciation measurement at Fresno - Garland | J-62 |
| Table J-22 | Quarterly PM _{2.5} model performance based on PM _{2.5} speciation measurement at Visalia | J-63 |
| Table J-23 | Quarterly PM _{2.5} model performance based on PM _{2.5} speciation measurement at Bakersfield | J-65 |
| Table J-24 | Quarterly PM _{2.5} model performance based on PM _{2.5} speciation measurement at Modesto | J-66 |
| Table J-25 | Model performance for 24-hour PM _{2.5} concentrations measured from continuous beta-attenuation PM _{2.5} monitors | J-71 |
| Table J-26 | Projected future year 2030 annual PM _{2.5} DVs at each monitor | J-72 |
| Table J-27 | 2030 Annual RRFs for PM _{2.5} components | J-73 |
| Table J-28 | 2017 Base year annual PM _{2.5} compositions (µg/m ³)* | J-74 |
| Table J-29 | Projected 2030 Annual PM _{2.5} compositions (µg/m ³)* | J-75 |
| Table J-30 | Difference in Annual PM _{2.5} DVs between the 2017 baseline run and precursor emission reduction runs* | J-78 |
| Table J-31 | Difference in Annual PM _{2.5} DVs between the 2030 baseline run and precursor emission reduction runs* | J-79 |
| Table J-32 | 2030 annual DVs difference calculated using the BDSNP soil NO _x algorithm compared to the default soil NO _x algorithm in MEGAN3.0 | J-84 |
| Table J-33 | Annual average prescribed burning PM _{2.5} emissions in the SJV | J-85 |
| Table J-34 | 2030 annual DVs difference calculated using the aggregated four year prescribed burning emissions for future year | J-87 |
| Table K-1 | 2024 PM _{2.5} Plan Public Process | K-1 |