United States Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EXPOSURE RESEARCH LABORATORY
HUMAN EXPOSURE & ATMOSPHERIC SCIENCES DIVISION (MD-D205-03)
Research Triangle Park, NC 27711
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Office of
Research and Development

LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS

Issue Date: **November 13, 2007**
(www.epa.gov/ttn/amtic/criteria.html)

These methods for measuring ambient concentrations of specified air pollutants have been designated as "reference methods" or "equivalent methods" in accordance with Title 40, Part 53 of the Code of Federal Regulations (40 CFR Part 53). Subject to any limitations (e.g., operating range or temperature range) specified in the applicable designation, each method is acceptable for use in state or local air quality surveillance systems under 40 CFR Part 58 unless the applicable designation is subsequently canceled. Automated methods for pollutants other than PM_{10} are acceptable for use only at shelter temperatures between 20°C and 30°C and line voltages between 105 and 125 volts unless wider limits are specified in the method description.

Prospective users of the methods listed should note (1) that each method must be used in strict accordance with its associated operation or instruction manual and with applicable quality assurance procedures, and (2) that modification of a method by its vendor or user may cause the pertinent designation to be inapplicable to the method as modified. (See Section 2.8 of Appendix C, 40 CFR Part 58 for approval of modifications to any of these methods by users.)

Further information concerning particular designations may be found in the *Federal Register* notice cited for each method or by writing to the National Exposure Research Laboratory, Human Exposure and Atmospheric Sciences Division (MD-D205-03), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. Technical information concerning the methods should be obtained by contacting the source listed for each method. Source addresses are listed at the end of the listing of methods, except for the addresses for lead method sources, which are given with the method. New analyzers or PM_{10} samplers sold as reference or equivalent methods must carry a label or sticker identifying them as designated methods. For analyzers or PM_{10} or samplers sold prior to the designation of a method with the same or similar model number, the model number does not necessarily identify an analyzer or sampler as a designated method. Consult the manufacturer or seller to determine if a previously sold analyzer or sampler can be considered a designated method or if it can be upgraded to designation status. Analyzer users who experience operational or other difficulties with a designated analyzer or sampler and are unable to resolve the problem directly with the instrument manufacturer may contact EPA (preferably in writing) at the above address for assistance.

This list will be revised as necessary to reflect any new designations or any cancellation of a designation currently in effect. The most current revision of the list will be available for inspection at EPA's Regional Offices, and copies may be obtained at the Internet site identified above or by writing to the National Exposure Research Laboratory at the address specified above.

Most Recent Designations

DKK-TOA Corp. Model GFS-312E Ambient SO_2 Analyzer	November 8, 2007
DKK-TOA Corp. Model GUX-313E Ambient O_3 Analyzer	November 8, 2007
DKK-TOA Corp. Model GFC-311E Ambient CO Analyzer	October 3, 2007
Teledyne API Model 300EU trace-level CO Analyzer	May 15, 2007
SIR S.A. Model S-5001 U.V. Fluorescence SO_2 Analyzer	May 10, 2007
Tanabyte Models 722, 723, 724, 725, 726 Ambient O_3 Analyzers	April 26, 2007
Teledyne API Model 100EU Trace-level SO_2 Analyzer	March 6, 2007
SIR S.A. Model S-5014 Photometric O_3 Analyzer	February 28, 2007

PARTICULATE MATTER - TSP

Reference Method for TSP *Manual Reference Method:* **40 CFR Part 50, Appendix B**
Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method)
[Federal Register: Vol. 47, page 54912, 12/06/82 and Vol. 48, page 17355, 04/22/83]

PARTICULATE MATTER - PM_{10}

Andersen Model RAAS10-100 PM10 Single Channel PM_{10} Sampler *Manual Reference Method:* **RFPS-0699-130**
"Andersen Instruments, Incorporated Model RAAS10-100 Single Channel Reference Method PM_{10} Sampler," with RAAS-10 PM_{10} inlet or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, and operated for 24-hour continuous sample periods at a flow rate of 16.67 liters/ minute, and in accordance with the Model RAAS105-100 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix J or Appendix M.
[*Federal Register:* Vol. 64, page 33481, 06/23/99]

Andersen Model RAAS10-200 PM10 Single Channel PM_{10} Audit Sampler *Manual Reference Method:* **RFPS-0699-131**
"Andersen Instruments, Incorporated Model RAAS10-200 Single Channel Reference Method PM_{10} Audit Sampler," with RAAS-10 PM_{10} inlet or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, and operated for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the Model RAAS105-200 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix J or Appendix M.
[*Federal Register:* Vol. 64, page 33481, 06/23/99]

Andersen Model RAAS10-300 PM10 Multi Channel PM_{10} Sampler *Manual Reference Method:* **RFPS-0699-132**
"Andersen Instruments, Incorporated Model RAAS10-300 Multi Channel Sequential Reference Method PM_{10} Sampler," with RAAS-10 PM_{10} inlet or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, and operated for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the Model RAAS105-300 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix J or Appendix M.
[*Federal Register:* Vol. 64, page 33481, 06/23/99]

BGI Incorporated Model PQ100 Air Sampler *Manual Reference Method:* **RFPS-1298-124**
"BGI Incorporated Model PQ100 Air Sampler" with BGI 16.7 Inlet Kit or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, for 24-hour continuous sample periods at a flow rate of 16.7 liters/minute, operated in accordance with the Model PQ100 Instruction Manual and with the requirements specified in 40 CFR Part 50, Appendix J or Appendix M, using either the original or the newer PQ200-type filter cassettes, and with or without the optional Solar Panel Power Supply. [*Federal Register:* Vol. 63, page 69625, 12/17/98]

BGI Incorporated Model PQ200 Air Sampler *Manual Reference Method:* **RFPS-1298-125**
"BGI Incorporated Model PQ200 Air Sampler" with "flat plate" PM_{10} inlet or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, and operated for 24-hour continuous sample periods in accordance with the Model PQ200 Instruction Manual and with the requirements specified in 40 CFR Part 50, Appendix J or Appendix M, and with or without the optional Solar Panel Power Supply. [*Federal Register:* Vol.. 63, page 69625, 12/17/98]

DKK-TOA Models FPM-222/222C, FPM223/223C, and DUB-222(S)/223(S) PM_{10} Monitor *Automated Equivalent Method:* **EQPM-0905-156**
"DKK-TOA Models FPM-222, FPM-222C, FPM-223, FPM-223C, DUB-222(S), and DUB-223(S) Particulate Monitor" for monitoring PM_{10} in Ambient Air (beta attenuation monitor), configured for PM_{10}, with Firmware Version DUB4-658355, Corrected Slope Factor (FACT SLOPE) set to 1.232, Corrected Zero Value (FACT ZERO) set to 1.8, and with or without any of the following options: Auto Check and Serial Recorder. [*Federal Register:* Vol. 70, page 56684, 09/28/05]

Ecotech Model 3000 PM_{10} High Volume Air Sampler *Manual Reference Method:* **RFPS-0706-162**
"Ecotech Pty. Ltd. Model 3000 PM_{10} High Volume Air Sampler," configured with the Ecotech PM_{10} Size-Selective Inlet (SSI)(P-ECO-HVS3000-02), with the flow rate set to 1.13 m^3/min (67.8 m^3/hour). [*Federal Register:* Vol. 71, page 42089, 07/25/06]

Environnement S.A. Model MP101M PM_{10} Monitor *Automated Equivalent Method:* **EQPM-0404-151**

"Environnement S. A. Model MP101M PM_{10} Beta Gauge Monitor," configured with the louvered PM_{10} inlet specified in 40 CFR 50 Appendix L or its flat-topped predecessor version and one of the three optional temperature-regulated sampling tubes (RST), and operated with a full scale measurement range of **0 - 0.500 mg/m^3** (0 - 500 µg/m^3), with the sample flow rate set to **1.00 m^3/h** and flow regulation set to **yes**, the "norms selection" set to **m^3** (actual volume), the "cycle" set to **24 hours**, the "period" set to **none**, and the "counting time" set to **200 seconds**.[2] [*Federal Register*: Vol. 69, page 18569, 4/8/04]

Graseby Andersen/GMW Model 1200 High-Volume Air Sampler *Manual Reference Method:* **RFPS-1287-063**

Sierra-Andersen or General Metal Works Model 1200 PM_{10} High-Volume Air Sampler System," consisting of a Sierra-Andersen or General Metal Works Model 1200 PM_{10} Size-Selective Inlet and any of the high-volume air samplers identified as SAUV-10H, SAUV-11H, GMW-IP-10, GMW-IP-10-70, GMW-IP-10-801, or GMW-IP-10-8000, which include the following components: Anodized aluminum high-volume shelter with either acrylonitrile butadiene styrene plastic filter holder and motor/blower housing or stainless steel filter holder and phenolic plastic motor/blower housing; 0.6 hp motor/blower; pressure transducer flow recorder; either an electronic mass flow controller or a volumetric flow controller; either a digital timer/programmer, seven-day mechanical timer, six-day timer/programmer, or solid-state timer/programmer; elapsed time indicator; and filter cartridge.

[*Federal Register:* Vol. 52, page 45684, 12/01/87 and Vol. 53, page 1062, 01/15/88]

Graseby Andersen/GMW Model 321-B High-Volume Air Sampler *Manual Reference Method:* **RFPS-1287-064**

"Sierra-Andersen or General Metal Works Model 321-B PM_{10} High-Volume Air Sampler System," consisting of a Sierra-Andersen or General Metal Works Model 321-B PM_{10} Size-Selective Inlet and any of the high-volume air samplers identified as SAUV-10H, SAUV-11H, GMW-IP-10, GMW-IP-10-70, GMW-IP-10-801, or GMW-IP-10-8000, which include the following components: Anodized aluminum high-volume shelter with either acrylonitrile butadiene styrene plastic filter holder and motor/blower housing or stainless steel filter holder and phenolic plastic motor/blower housing; 0.6 hp motor/blower; pressure transducer flow recorder; either an electronic mass flow controller or a volumetric flow controller; either a digital timer/programmer, seven-day mechanical timer, six-day timer/programmer, or solid-state timer/programmer; elapsed time indicator; and filter cartridge.

[*Federal Register:* Vol. 52, page 45684, 12/01/87 and Vol. 53, page 1062, 01/15/88]

Graseby Andersen/GMW Model 321-C High-Volume Air Sampler *Manual Reference Method:* **RFPS-1287-065**

"Sierra-Andersen or General Metal Works Model 321-C PM_{10} High-Volume Air Sampler System," consisting of a Sierra-Andersen General Metal Works Model 321-C PM_{10} or Size-Selective Inlet and any of the high-volume air samplers identified as SAUV-10H, SAUV-11H, GMW-IP-10, GMW-IP-10-70, GMW-IP-10-801, or GMW-IP-10-8000, which include the following components: Anodized aluminum high-volume shelter with either acrylonitrile butadiene styrene plastic filter holder and motor/blower housing or stainless steel filter holder and phenolic plastic motor/blower housing; 0.6 hp motor/blower; pressure transducer flow recorder; either an electronic mass flow controller or a volumetric flow controller; either a digital timer/programmer, seven-day mechanical timer, six-day timer/programmer, or solid-state timer/programmer; elapsed time indicator; and filter cartridge.

[*Federal Register:* Vol. 52, page 45684, 12/01/87 and Vol. 53, page 1062, 01/15/88]

Graseby Andersen/GMW Models SA241 and SA241M Dichotomous Sampler *Manual Reference Method:* **RFPS-0789-073**

"Sierra-Andersen Models SA241 and SA241M or General Metal Works Models G241 and G241M PM_{10} Dichotomous Samplers," consisting of the following components: Sampling Module with SA246b or G246b 10 µm inlet or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, 2.5 µm virtual impactor assembly, 37 mm coarse and fine particulate filter holders, and tripod mount; Control Module with diaphragm vacuum pump, pneumatic constant flow controller, total and coarse flow rotameters and vacuum gauges, pressure switch (optional), 24-hour flow/event recorder, digital timer/programmer or 7-day skip timer, and elapsed time indicator.

[*Federal Register:* Vol. 54, page 31247, 07/27/89]

Graseby Andersen/GMW Model FH621-N Beta Monitor *Automated Equivalent Method:* **EQPM-0990-076**

"Andersen Instruments Model FH62I-N PM_{10} Beta Attenuation Monitor," consisting of the following components: FH101 Vacuum Pump Assembly; FH102 Accessory Kit; FH107 Roof Flange Kit; FH125 Zero and Span PM_{10} Mass Foil Calibration Kit; FH62I Beta Attenuation 19-inch Control Module; SA246b PM_{10} Inlet (16.7 liter/min) or the louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19; operated for 24-hour average measurements, with an observing time of 60 minutes, the calibration factor set to 2400, a glass fiber filter tape, an automatic filter advance after each 24-hour sample period, and with or without either of the following options: FH0P1 Indoor Cabinet; FH0P2 Outdoor Shelter Assembly. [*Federal Register:* Vol. 55, page 38387, 09/18/90]

Met One or Sibata Models BAM/GBAM 1020, BAM/GBAM 1020-1 *Automated Equivalent Method:* **EQPM-0798-122**
"Met One Instruments or Sibata Scientific Technology Models BAM 1020, GBAM 1020, BAM 1020-1, and GBAM 1020-1 PM_{10} Beta Attenuation Monitor," including the BX-802 sampling inlet, operated for 24-hour average measurements, with a filter change frequency of one hour, with glass fiber filter tape, and with or without any of the following options: BX-823, tube extension; BX-825, heater kit; BX-826, 230 Vac heater kit; BX-827 "Smart Heater" set for maintaining sample moisture between 35% and 45% relative humidity and no $\triangle$T control, BX-828, roof tripod; BX-902, exterior enclosure; BX-903, exterior enclosure with temperature control; BX-961, mass flow controller; BX-967, internal calibration device. For software (firmware) versions V3.0 or higher, a user-selectable measurement time (COUNT TIME) setting of 4, 6, or 8 minutes may be selected, along with the appropriate sample time (BAM SAMPLE) setting of 50, 46, or 42 minutes, respectively, to maintain a 60-minute measurement cycle time.
[*Federal Register:* Vol. 63, page 41253,08/03/98]

Oregon DEQ Medium Volume PM_{10} Sampler *Manual Reference Method:* **RFPS-0389-071**
"Oregon DEQ Medium Volume PM_{10} Sampler." NOTE: This method is not now commercially available.
[*Federal Register:* Vol. 54, page 12273,03/24/89]

Thermo Andersen Series FH 62 C14 Continuous PM10 Monitor *Automated Equivalent Method:* **EQPM-1102-150**
"Thermo Andersen Series FH 62 C14 Continuous PM10 Ambient Particulate Monitor," operated for 24-hour average measurements, with the specified 10-micron inlet, inlet connector, sample tube with heater, roof flange kit, mass foil kit, pump kit, sample filter tape; with operational settings of 1000 L/h (16.67 L/min) sample flow rate, daily filter change, auto filter change at volumetric flow < 950 L/h, auto filter change at mass > 1500 micrograms, and factory default calculation mode settings; and with operational calibration and servicing as outlined in the Operator Manual. [*Federal Register:* Vol. 67, page 76174, 12/11/02]

Thermo Scientific or **Rupprecht & Patashnick Partisol Model 2000 Air Sampler** *Manual Reference Method:* **RFPS-0694-098**
"Thermo Scientific Partisol 2000 Air Sampler" or "Rupprecht & Patashnick Partisol Model 2000 Air Sampler," consisting of a Hub Unit and 0, 1, 2, or 3 Satellite Units, with each sampling station used for PM_{10} measurements equipped with a Rupprecht & Patashnick PM-10 inlet and operated for continuous 24-hour periods using the Basic, Manual, Time, Analog Input, or Serial Input programming modes, and with or without any of the following options: $PM_{2.5}$- style filter cassette holder; louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19 in lieu of standard inlet; 57-002320 Stand for Hub or Satellite; 59-002542 Advanced EPROM; 10-001403 Large Pump (1/4 hp); 120 VAC. Hardware for Indoor Installation consists of: 51-002638-xxxx Temperature Sensor (Extended Length); 55-001289 Roof Flange (1 1/4"); 57-000604 Support Tripod for Inlet; 57-002526-0001 Sample Tube Extension (1 m); 57-002526-0002 Sample Tube Extension (2 m). Hardware for Outdoor Installation in Extreme Cold Environments consists of: 10-002645 Insulating Jacket for Hub Unit. [*Federal Register:* Vol. 59, page 35338, 07/11/94]

Thermo Scientific Partisol 2000-FRM PM_{10} Air Sampler or
Rupprecht and Patashnick Partisol®-FRM 2000 PM_{10} Air Sampler *Manual Reference Method:* **RFPS-1298-126**
"Thermo Scientific Partisol 2000-FRM PM_{10} Air Sampler" or "Rupprecht and Patashnick Partisol®-FRM 2000 PM_{10} Air Sampler" with PM_{10} inlet or louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, and operated for 24-hour continuous sample periods in accordance with the Model 2000 Instruction Manual and with the requirements specified in 40 CFR Part 50, Appendix J or Appendix M. [*Federal Register:* Vol. 63, page 69625, 12/17/98]

Thermo Scientific Partisol-Plus 2025 PM_{10} Sequential Air Sampler or
Rupprecht and Patashnick Partisol®-Plus 2025 PM_{10} Sequential Air Sampler *Manual Reference Method:* **RFPS-1298-127**
"Thermo Scientific Partisol-Plus 2025 Sequential Air Sampler" or "Rupprecht and Patashnick Company Partisol®-Plus Model 2025 PM_{10} Sequential Air Sampler" with PM_{10} inlet or louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19, configured as a PM_{10} reference method, and operated for 24-hour continuous sample periods in accordance with the Model 2025 Instruction Manual and with the requirements specified in 40 CFR Part 50, Appendix J or Appendix M. [*Federal Register:* Vol. 63, page 69625, 12/17/98]

Thermo Scientific TEOM 1400AB PM_{10} Ambient Particulate Monitor or
Rupprecht & Patashnick TEOM Series 1400/1400a PM_{10} Monitors *Automated Equivalent Method:* **EQPM-1090-079**
"Thermo Scientific TEOM 1400AB [PM_{10}] Ambient Particulate Monitor" or "Rupprecht & Patashnick TEOM Series 1400 and Series 1400a PM-10 Monitors" (including serial number prefixes 1400, 140A, 140AA, 140AB, 140AT, and 140UP), consisting of the following components: TEOM Sensor Unit; TEOM Control Unit; Flow Splitter (3 liter/min sample flow); Teflon-Coated Glass Fiber Filter Cartridges; Rupprecht & Patashnick PM-10 Inlet (part number 57-00596), Sierra-Andersen Model 246b PM-10 Inlet (16.7 liter/min) or louvered inlet specified in 40 CFR 50 Appendix L, Figs. L-2 thru L-19; operated for 24-hour average measurements, with the total mass averaging time set at 300 seconds, the mass rate/mass concentration averaging time set at 300 seconds, the gate time set at 2 seconds, and with or without any of the following options: Tripod; Outdoor Enclosure; Automatic Cartridge Collection Unit (Series 1400a only); Flow Splitter Adapter (for 1 or 2 liter/min sample flow). [*Federal Register:* Vol. 55, page 43406, 10/29/90]

Tisch Environmental Model TE-6070 PM10 High-Volume Air Sampler or
New Star Environmental Model NS-6070 PM10 High-Volume Air Sampler *Manual Reference Method:* **RFPS-0202-141**
"Tisch Environmental Model TE-6070 or New Star Environmental Model NS-6070 PM10 High-Volume Air Sampler," consisting of a TE-6001 PM10 size-selective inlet, 8" x 10" filter holder, aluminum outdoor shelter, mass flow controller or volumetric flow controller with brush or brushless motor, 7-day mechanical off/on-elapsed timer or 11-day digital off/on-elapsed timer, and any of the high volume sampler variants identified as TE-6070-BL or NS-6070-BL, TE-6070D or NS-6070D, TE-6070D-BL or NS-6070-BL, TE-6070V or NS-6070V, TE-6070V-BL or NS-6070V-BL, TE-6070-DV or NS-6070-DV, or TE-6070DV-BL or NS-6070DV-BL, with or without the optional stainless steel filter media holder/filter cartridge or continuous flow/pressure recorder.
[*Federal Register:* Vol. 67, page 15566, 04/02/02]

Wedding & Associates' or Thermo Environmental Instruments Inc.
Model 600 PM_{10} High-Volume Sampler *Manual Reference Method:* **RFPS-1087-062**
"Wedding & Associates' or Thermo Environmental Instruments, Inc. Model 600 PM_{10} Critical Flow High-Volume Sampler," consisting of the following W&A/TEII components: PM_{10} Inlet; Critical Flow Device; Anodized Aluminum Shelter; Blower Motor Assembly for 115, 220 or 240 VAC and 50/60 Hz; Mechanical Timer; Elapsed Time Indicator; and Filter Cartridge/Cassette, and with or without the following options: Digital Timer, 6 or 7 Day Timer, and 1 or 7 Day Pressure Recorder.
[*Federal Register:* Vol. 52, page 37366,10/06/87]

Wedding & Associates' or Thermo Environmental Instruments Inc.
Model 650 PM_{10} Beta Gauge *Automated Equivalent Method:* **EQPM-0391-081**
"Wedding & Associates' or Thermo Environmental Instruments, Inc. Model 650 PM_{10} Beta Gauge Automated Particle Sampler," consisting of the following W&A/TEII components: Particle Sampling Module, PM_{10} Inlet (18.9 liter/min), Inlet Tube and Support Ring, Vacuum Pump (115, 220 or 240 VAC and 50/60 Hz); and operated for 24-hour average measurements with glass fiber filter tape. [*Federal Register:* Vol. 56, page 9216, 03/05/91]

PARTICULATE MATTER - $PM_{2.5}$

Andersen Model RAAS2.5-200 PM2.5 Ambient Audit Air Sampler *Manual Reference Method:* **RFPS-0299-128**
"Andersen Instruments, Incorporated Model RAAS2.5-200 PM2.5 Audit Sampler," configured as a $PM_{2.5}$ reference method and operated with software (firmware) version 4B, 5.0.1 - 6.09, 6.0A, or 6.0B, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the Model RAAS2.5-200 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L. [*Federal Register:* Vol. 64, page 12167, 03/11/99]

BGI Inc. Models PQ200 or PQ200A $PM_{2.5}$ Ambient Fine Particle Sampler *Manual Reference Method:* **RFPS-0498-116**
"BGI Incorporated Models PQ200 and PQ200A $PM_{2.5}$ Ambient Fine Particle Sampler," operated with firmware version 3.88 or 3.89R, for 24-hour continuous sample periods, in accordance with the Model PQ200/PQ200A Instruction Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L, and with or without the optional Solar Power Supply or the optional dual-filter cassette (P/N F-21/6) and associated lower impactor housing (P/N B2027), where the upper filter is used for $PM_{2.5}$. The Model PQ200A is described as a portable audit sampler and includes a set of three carrying cases.
[*Federal Register:* Vol. 63, page 18911, 04/16/98]

BGI Inc. Models PQ200-VSCC or PQ200A-VSCC $PM_{2.5}$ Sampler *Manual Reference Method:* **RFPS-0498-116**
or *Manual Equivalent Method:* **EQPM-0202-142**
"BGI Incorporated Models PQ200-VSCC or PQ200A-VSCC $PM_{2.5}$ Ambient Fine Particle Sampler," configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator and operated with firmware version 3.88, 3.91, 3.89R, or 3.91R, for 24-hour continuous sample periods, in accordance with the Model PQ200/PQ200A Instruction Manual and VSCC supplemental manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L, and with or without the optional Solar Power Supply or the optional dual-filter cassette (P/N F-21/6) and associated lower impactor housing (P/N B2027), where the upper filter is used for $PM_{2.5}$. The Model PQ200A VSCC is described as a portable audit sampler and includes a set of three carrying cases.
[*Federal Register:* Vol. 67, page 15567, 04/02/02]

Graseby Andersen Model RAAS2.5-100 PM2.5 Ambient Air Sampler *Manual Reference Method:* **RFPS-0598-119**
"Graseby Andersen Model RAAS2.5-100 PM2.5 Ambient Air Sampler," operated with software version 4B, 5.0.1 - 6.09, 6.0A, or 6.0B, configured for "Single 2.5" operation, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the Model RAAS2.5-100 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L. [*Federal Register:* Vol. 63, page 31991, 06/11/98]

Graseby Andersen Model RAAS2.5-300 PM2.5 Sequential Ambient Air Sampler *Manual Reference Method:* **RFPS-0598-120**

"Graseby Andersen Model RAAS2.5-300 PM2.5 Sequential Ambient Air Sampler," operated with software version 4B, 5.0.1 - 6.09, 6.0A, or 6.0B, configured for "Multi 2.5" operation, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the Model RAAS2.5-300 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L. [*Federal Register:* Vol. 63, page 31991, 06/11/98]

Rupprecht & Patashnick Partisol®-FRM Model 2000 PM-2.5 Air Sampler *Manual Reference Method:* **RFPS-0498-117**

"Rupprecht & Patashnick Company, Incorporated Partisol®-FRM Model 2000 PM-2.5 Air Sampler," operated with software versions 1.102 - 1.202, with either R&P-specified machined or molded filter cassettes, with or without the optional insulating jacket for cold weather operation, for 24-hour continuous sample periods, in accordance with the Model 2000 Instruction Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L.

[*Federal Register:* Vol. 63, page 18911, 04/16/98]

Rupprecht & Patashnick Partisol® Model 2000 PM-2.5 Audit Sampler *Manual Reference Method:* **RFPS-0499-129**

"Rupprecht & Patashnick Company, Inc. Partisol® Model 2000 PM-2.5 Audit Sampler," configured as a $PM_{2.5}$ reference method and operated with software (firmware) version 1.2 - 1.202, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, in accordance with the Partisol® Model 2000 Operating Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L. [*Federal Register:* Vol. 64, page 19153, 04/19/99]

Rupprecht & Patashnick Partisol® Model 2000 PM-2.5 FEM Audit Sampler *Manual Reference Method:* **RFPS-0499-129**
or *Manual Equivalent Method:* **EQPM-0202-144**

"Rupprecht & Patashnick Co., Inc. Partisol® Model 2000 PM-2.5 FEM Audit Sampler," configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator, and operated with software (firmware) version 1.2 - 1.202, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, in accordance with the Partisol® Model 2000 Operating Manual and VSCC supplemental manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L.

[*Federal Register:* Vol. 67, page 15567, 04/02/02]

Rupprecht & Patashnick Partisol®-Plus Model 2025 Sequential Air Sampler *Manual Reference Method:* **RFPS-0498-118**

"Rupprecht & Patashnick Company, Incorporated Partisol®-Plus Model 2025 PM-2.5 Sequential Air Sampler," operated with any software version 1.003 through 1.4.16, with either R&P-specified machined or molded filter cassettes, for 24-hour continuous sample periods, in accordance with the Model 2025 Instruction Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L. [*Federal Register:* Vol. 63, page 18911, 04/16/98]

Thermo Electron Model RAAS2.5-100 FEM $PM_{2.5}$ Ambient Air Sampler *Manual Reference Method:* **RFPS-0598-119**
or *Manual Equivalent Method:* **EQPM-0804-153**

"Thermo Electron Corporation Model RAAS2.5-100 FEM" $PM_{2.5}$ Ambient Air Sampler, configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator and operated with software version 06.0B.00 configured for "Single 2.5" operation, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, in accordance with the Model RAAS2.5-100 FEM Operator's Manual and VSCC™ supplemental manual, and in accordance with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L [*Federal Register:* Vol. 69, page 47924, 08/06/04]

Thermo Electron Model RAAS2.5-200 FEM $PM_{2.5}$ Audit Air Sampler *Manual Reference Method:* **RFPS-0299-128**
or *Manual Equivalent Method:* **EQPM-0804-154**

"Thermo Electron Corporation Model RAAS2.5-200 FEM" $PM_{2.5}$ Audit Air Sampler, configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator and operated with software version 06.0B.00, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, in accordance with the Model RAAS2.5-200 FEM Operator's Manual and VSCC supplemental manual, and in accordance with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L.

[*Federal Register:* Vol. 69, page 47924, 08/06/04]

Thermo Electron Model RAAS2.5-300 FEM $PM_{2.5}$ Sequential Ambient Air Sampler *Manual Reference Method:* **RFPS-0598-120**
or *Manual Equivalent Method:* **EQPM-0804-155**

"Thermo Electron Corporation Model RAAS2.5-300 FEM" $PM_{2.5}$ Sequential Ambient Air Sampler, configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator and operated with software version 06.0B.00 configured for "Multi 2.5" operation, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, in accordance with the Model RAAS2.5-300 FEM Operator's Manual and VSCC supplemental manual, and in accordance with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L [*Federal Register:* Vol. 69, page 47924, 08/06/04]

Thermo Environmental Instruments, Incorporated Model 605 "CAPS" Sampler *Manual Reference Method:* **RFPS-1098-123**
"Thermo Environmental Instruments, Incorporated Model 605 "CAPS" Computer Assisted Particle Sampler," configured as a PM2.5 reference method and operated with software version 1.02A, for 24-hour continuous sample periods, in accordance with the Model 605 Instruction Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L.
[*Federal Register:* Vol. 63, page 58036, 10/29/98]

Thermo Scientific Partisol 2000-FRM $PM_{2.5}$ Air Sampler or *Manual Reference Method:* **RFPS-0498-117**
Rupprecht & Patashnick Partisol®-FRM 2000 PM-2.5 Air Sampler or *Manual Equivalent Method:* **EQPM-0202-143**
"Thermo Scientific Partisol 2000-FRM $PM_{2.5}$ Air Sampler" or "Rupprecht & Patashnick Partisol®-FRM 2000 PM-2.5 [FEM] Air Sampler," configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator and operated with software versions 1.102 - 1.202, with either R&P-specified machined or molded filter cassettes, for 24-hour continuous sample periods, in accordance with the Model 2000 Instruction Manual and VSCC supplemental manual, with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L, and with or without the optional insulating jacket for cold weather operation.
[*Federal Register:* Vol. 67, page 15567, 04/02/02]

Thermo Scientific Partisol-Plus 2025 Sequential $PM_{2.5}$ Air Sampler or *Manual Reference Method:* **RFPS-0498-118**
Rupprecht & Patashnick Partisol®-Plus 2025 PM-2.5 Sequential Sampler or *Manual Equivalent Method:* **EQPM-0202-145**
"Thermo Scientific Partisol-Plus 2025 Sequential Air Sampler" or "Rupprecht & Patashnick Partisol®-Plus 2025 PM-2.5 [FEM] Sequential Air Sampler," configured with a BGI VSCC™ Very Sharp Cut Cyclone particle size separator, and operated with any software version 1.003 through 1.4.16, with either R&P-specified machined or molded filter cassettes, for 24-hour continuous sample periods, in accordance with the Model 2025 Instruction Manual and VSCC supplemental manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L. [*Federal Register:* Vol. 67, page 15567, 04/02/02]

URG-MASS100 Single PM 2.5 FRM Sampler *Manual Reference Method:* **RFPS-0400-135**
"URG-MASS100 Single PM 2.5 FRM Sampler," operated with software (firmware) version 4B or 5.0.1, configured for "Single 2.5" operation, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the URG-MASS100 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L.
[*Federal Register*: Vol. 65, page 26603, 05/08/00]

URG-MASS300 Sequential PM 2.5 FRM Sampler *Manual Reference Method:* **RFPS-0400-136**
"URG-MASS300 Sequential PM 2.5 FRM Sampler," operated with software (firmware) version 4B or 5.0.1, configured for "Multi 2.5" operation, for 24-hour continuous sample periods at a flow rate of 16.67 liters/minute, and in accordance with the URG-MASS300 Operator's Manual and with the requirements and sample collection filters specified in 40 CFR Part 50, Appendix L.
[*Federal Register*: Vol. 65, page 26603, 05/08/00]

SULFUR DIOXIDE

Reference Method for SO_2 (Pararosaniline Method) *Manual Reference Method:* **40 CFR Part 50, Appendix A**
Reference Method for the Determination of Sulfur Dioxide in the Atmosphere (Pararosaniline Method)
[*Federal Register:* Vol. 47, page 54899, 12/06/82 and Vol. 48, 17355, 04/22/83]

Pararosaniline Method for SO_2 - Technicon I *Manual Equivalent Method:* **EQS-0775-001**
"Pararosaniline Method for the Determination of Sulfur Dioxide in the Atmosphere-Technicon I Automated Analysis System"
[*Federal Register:* Vol. 40, page 34024, 08/13/75]

Pararosaniline Method for SO_2 - Technicon II *Manual Equivalent Method:* **EQS-0775-002**
"Pararosaniline Method for the Determination of Sulfur Dioxide in the Atmosphere-Technicon II Automated Analysis System"
[*Federal Register:* Vol. 40, page 34024, 08/13/75]

Advanced Pollution Instrumentation, Inc. Model 100 SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0990-077**
"Advanced Pollution Instrumentation, Inc. Model 100 Fluorescent SO_2 Analyzer," operated on the 0-0.1 ppm[1], the 0-0.2 ppm[1], the 0-0.5 ppm, or the 0-1.0 ppm range with a 5-micron TFE filter element installed in the rear-panel filter assembly, either a user- or vendor-supplied vacuum pump capable of providing 20 inches of mercury vacuum at 2.5 L/min, with or without any of the following options: Internal Zero/Span; Pump Pack; Rack Mount With Slides; RS-232 Interface; Status Output; TFE Zero/Span Valves; Zero Air Scrubber; Dual Range.[2] [*Federal Register:* Vol. 55, page 38149, 09/17/90]

ASARCO Model 500 SO_2 Monitor *Automated Equivalent Method:* **EQSA-0877-024**
"ASARCO Model 500 Sulfur Dioxide Monitor," operated on a 0-0.5 ppm range; or "ASARCO Model 600 Sulfur Dioxide Monitor," operated on a 0-1.0 ppm range. (Both models are identical except for the range.) NOTE: This method is not now commercially available. [*Federal Register:* Vol. 42, page 44264, 09/02/77 and Vol. 44, page 67522, 11/26/79]

Beckman Model 953 Fluorescent Ambient SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0678-029**
"Beckman Model 953 Fluorescent Ambient SO_2 Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with a time constant setting of 2, 2.5, or 3 minutes, a 5 to 10 micron membrane filter element installed in the rear-panel filter assembly, with or without any of the following options: Remote Operation Kit, Catalog No. 641984; Digital Panel Meter, Catalog No. 641710; Rack Mount Kit, Catalog No. 641709; Panel Mount Kit, Catalog No. 641708. [*Federal Register:* Vol. 43, page 35995, 08/14/78]

Bendix Model 8303 Sulfur Analyzer *Automated Equivalent Method:* **EQSA-1078-030**
"Bendix Model 8303 Sulfur Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with a Teflon filter installed on the sample inlet of the H_2S scrubber assembly. [*Federal Register:* Vol. 43, page 50733, 10/31/78]

Columbia Scientific Industries Model 5700 SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0494-095**
"Columbia Scientific Industries Model 5700 Sulfur Dioxide Analyzer", operated with software version 1.0 on any full scale range between 0-250 ppb[1] and 0-1000 ppb, at any integration time setting from 20 to 99 seconds, at any temperature in the range of 15°C to 30°C, at any AC line voltage in the range of 105 to 130 volts, and with or without any of the following options:

964-0121 Alarm Relay Contacts	964-0125 Dual Current Outputs	964-0131 Rack Mount
964-0122 Input Solenoids	964-0126 Printer	964-0012 Single Headed Pump
964-0124 Dual Analog Voltage Outputs		

[*Federal Register:* Vol. 59, page 18818, 04/20/94]

Dasibi Model 4108 U.V. Fluorescence SO_2 Analyzer *Automated Equivalent Method:* **EQSA-1086-061**
"Dasibi Model 4108 U.V. Fluorescence SO_2 Analyzer," operated with a range of 0-100 ppb[1], 0-200 ppb[1], 0-500 ppb, or 0-1000 ppb, with a Teflon-coated particulate filter and continuous hydrocarbon removal system, with or without any of the following options: Rack Mounting Brackets And Slides; RS-232-C Interface; Temperature Correction. [*Federal Register:* Vol. 51, page 32244, 09/10/86]

DKK-TOA Corp. Model GFS-32 U.V. Fluorescent SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0701-115**
"DKK-TOA Corporation Model GFS-32 Ambient Air SO_2 Ultraviolet Fluorescent Analyzer, operated within the 0.000 to 0.500 ppm range in the temperature range of 20°C to 30°C. [*Federal Register:* Vol. 62, page 44007, 08/18/97]

DKK-TOA Corp. Model GFS-112E U. V. Fluorescent SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0100-133**
"DKK-TOA Corporation Models GFS-112E and GFS-112E-1 U.V. Fluorescence SO_2 Analyzer," operated at any temperature ranging from 15° C to 35° C, on any of the following measurement ranges: 0-0.05 ppm[1], 0-0.100 ppm[1], 0-0.200 ppm[1], 0-0.5 ppm, or 0-1.000 ppm, and with or without the optional Internal zero air supply and permeation tube oven.[2]
[*Federal Register:* Vol. 65, page 2610, 01/18/00]

DKK-TOA Corp. Model GFS-312E Ambient SO_s Analyzer *Automated Equivalent Method:* **EQSA-1107-168**
"DKK-TOA Corporation Model GFS-312E Ambient SO_2 Analyzer, operated at any environmental temperature in the range of 20 °C to 30 °C on any of the following measurement ranges[1]: 0-0.1 ppm, 0-0.2 ppm and 0-0.5 ppm.[2]
[*Federal Register:* Vol. 72, page 63176, 11-08-07]

Environnement S.A. Model AF21M SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0292-084**
"Environnement S.A Model AF21M Sulfur Dioxide Analyzer," operated on a range of 0-0.5 ppm with a response time coefficient setting of 01, a Teflon filter installed in the rear-panel filter assembly, and with or without any of the following options: Rack Mount/Slides; RS-232-C Interface. [*Federal Register:* Vol. 57, page 5444, 02/14/92]

Environnement S.A. Model AF22M SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0802-149**
"Environnement S.A Model AF22M UV Fluorescence Sulfur Dioxide Analyzer," operated with a full scale range of 0 - 500 ppb, at any temperature in the range of 10 °C to 35 °C, with a 5-micron PTFE sample particulate filter, with a response time setting of 11 (Automatic response time), with the automatic "ZERO-REF" cycle ON and set for activation every 24 hours, and with or without either of the following options: Permeation oven, Rack mount slides.[2] [*Federal Register:* Vol. 67, page 57811, 09/12/02]

Environnement S.A. SANOA Multigas Longpath Monitoring System *Automated Equivalent Method:* **EQSA-0400-138**

"Environnement S.A. Model SANOA Multigas Longpath Air Quality Monitoring System," consisting of a receiver, one or more projectors, interface unit, a user-provided control unit computer running the SANOA VisionAIR software, and associated incidental equipment; configured for measuring SO_2, with the temperature control and internal calibration cell options installed, operated with a measurement range of 0 to 0.5 ppm, over an installed monitoring path length of between 27 and 500 meters, within an ambient air temperature range of -30 to +45°C, with a measurement (integrating) time of 180 seconds, and with or without external temperature and barometric pressure sensors or any of the following options: external (meteo) input connection, series 1M bus connection, OGR type projector, analog outputs. [*Federal Register*: Vol. 65, page 26603, 05/08/00]

Horiba Models APSA-360, APSA-360-CE, or APSA-360A-CE SO_2 Monitors *Automated Equivalent Method:* **EQSA-0197-114**

"Horiba Instruments, Inc. Models APSA-360, APSA-360-CE or APSA-360A-CE Ambient Sulfur Dioxide Monitor,"operated with a full scale range of 0 - 0.50 ppm, at any temperature in the range of 5 °C to 40 °C, with a Line Setting of "MEASURE", an Analog Output Setting of "MOMENTARY VALUE", and with or without any of the following options:[2]

1) Rack Mounting Plate and Side Rails, 2) RS-232 Communications Port, and 3) Internal zero gas and span gas generator.

"Horiba Instruments, Inc. Model APSA-360A-CE Ambient Sulfur Dioxide Monitor," operated with one of the following measurement ranges: 0-0.05 ppm, 0-0.1 ppm, 0-0.2 ppm, 0-0.5 ppm or 0-1.0 ppm; with selectable time constants from 10 to 300 seconds; at any temperature in the range of 5 °C to 40 °C; and with or without the optional internal zero gas and span gas generator.

[*Federal Register*: Vol. 62, page 6968, 02/14/97; Vol. 63, page 31992, 06/11/98]

Horiba Model APSA-370 Ambient SO_2 monitor *Automated Equivalent Method:* **EQSA-0506-159**

"Horiba Instruments Incorporated Model APSA-370 Ambient SO_2 Monitor," operated with a full scale fixed measurement range of 0 - 0.50 ppm, with the automatic range switching off, at any environmental temperature in the range of 20 °C to 30 °C.[2]

[*Federal Register*: Vol. 71, page 25587, 05/01/06]

Lear Siegler Model AM2020 SO_2 Monitor *Automated Equivalent Method:* **EQSA-0486-049**

"Lear Siegler Model AM2020 Ambient SO_2 Monitor," operated on a range of either 0-0.5 or 0-1.0 ppm, at a wavelength of 299.5 nm, with a 5 minute integration period, over any 10°C temperature range between 20°C and 45°C, with or without the automatic zero and span correction feature. [*Federal Register:* Vol. 45, page 79574, 12/01/80 and Vol. 46, page 9997, 01/30/81]

Lear Siegler Model SM1000 SO_2 Monitor *Automated Equivalent Method:* **EQSA-1275-005**

"Lear Siegler Model SM1000 SO_2 Ambient Monitor," operated on the 0-0.5 ppm range, at a wavelength of 299.5 nm, with the "slow" (300 second) response time, with or without any of the following options: SM-1 Internal Zero/Span; SM-2 Span Timer Card; SM-3 0-0.1 Volt Output; SM-4 0-5 Volt Output; SM-5 Alternate Sample Pump; SM-6 Outdoor Enclosure. [*Federal Register:* Vol. 41, page 3893, 01/27/76; Vol. 41, page 32946, 08/06/76; Vol. 42, page 13044, 03/08/77; Vol. 45, page 1147, 01/04/80]

Meloy Model SA185-2A SO_2 Analyzer *Automated Equivalent Method:* **EQSA-1275-006**

"Meloy Model SA185-2A Sulfur Dioxide Analyzer," operated on the 0-0.5 ppm range, with or without any of the following options:

S-1 Linearized Output	S-2 Modified Recorder Output	S-18 Rack Mount Conversion
S-24 Dual Range Linearized Output	S-5 Teflon-Coated Block	S-18A Rack Mount Conversion
S-33 Remote Range Control And Status	S-6A Reignite Timer Circuit	S-21Front Panel Digital (Signals)
S-7 Press To Read Volt Meter	S-34 Remote Control	S-11A Manual Zero And Span
S-22 Remote Zero/Span Control And Status (Timer)	S-35 Front Panel Digital Meter With BCD Output	
S-11B Automatic Zero And Span	S-13 Status Lights	S-22A Remote Zero/Span Control
S-36 Dual Range Log-Linear Output	S-14 Output Booster Amplifier	S-23 Automatic Zero Adjust
S-38 Sampling Mode Status	S-14B Line Transmitter Board	S-23A Automatic/Manual Zero Adjust

or operated on the 0-1.0 ppm range with either option S-36 or options S-1 and S-24, with or without any of the other options.

[*Federal Register:* Vol. 41, page 3893, 01/27/76 and Vol. 43, page 38088, 08/25/78]

Meloy Model SA285E SO_2 Analyzer *Automated Equivalent Method:* **EQSA-1078-032**

"Meloy Model SA285E Sulfur Dioxide Analyzer," operated on the following ranges and time constant switch positions:

Range, ppb:	0-50[1]	0-100[1]	0-500	0-1000
Time Constant Setting:	1 or 10	1 or 10	off, 1 or 10	off, 1 or 10

The analyzer may be operated at temperatures between 10°C and 40°C and at line voltages between 105 and 130 volts, with or without any of the following options:

S-5 Teflon Coated Block
S-14B Line Transmitter Board
S-18 Rack Mount Conversion
S-18A Rack Mount Conversion
S-21 Front Panel Digital Meter
S-22 Remote Zero/Span Control And Status (Timer)
S-22A Remote Zero/Span Control
S-22B Remote Zero/Span Control And Status (Pulse)
S-23 Auto Zero Adjust
S-23A Auto/Manual Zero Adjust
S-25 Press To Read
S-26 Manual Zero And Span
S-27 Auto Manual Zero/Span
S-28 Auto Range And Status
S-30 Auto Reignite
S-32 Remote Range Control And Status
S-35 Front Panel Digital Meter With BCD Output
S-37 Temperature Status Lights
S-38 Sampling Mode Status

[*Federal Register:* Vol. 43, page 50733, 10/31/78]

Meloy Model SA 700 Fluorescence Sulfur Dioxide Analyzer *Automated Equivalent Method:* **EQSA-0580-046**

"Meloy Model SA 700 Fluorescence Sulfur Dioxide Analyzer," operated on the 0-250 ppb[1], the 0-500 ppb, or the 0-1000 ppb range with a time constant switch position of either 2 or 3. The analyzer may be operated at temperatures between 20°C and 30°C and at line voltages between 105 and 130 volts, with or without any of the following options: FS-1 Current Output; FS-2 Rack Mount Conversion; FS-2A Rack Mount Conversion; FS-2B Rack Mount Conversion; FS-3 Front Panel Mounted Digital Meter; FS-5 Auto/Manual Zero/Span With Status; FS-6 Remote/Manual Zero/Span With Status; FS-7 Auto Zero Adjust.

[Federal Register: Vol. 45, page 31488, 05/13/80]

Monitor Labs Model 8450 Sulfur Monitor *Automated Equivalent Method:* **EQSA-0876-013**

"Monitor Labs Model 8450 Sulfur Monitor", operated on a range of either 0-0.5 or 0-1.0 ppm, with a 5 second time constant, a model 8740 hydrogen sulfide scrubber in the sample line, with or without any of the following options: BP Bipolar Signal Processor; IZS Internal Zero/Span Module; V Zero/Span Valves; CLO Current Loop Output; TF TFE Sample Particulate Filter; VT Zero/Span Valves And Timer; DO Status Remote Interface. [*Federal Register:* Vol. 41, page 36245, 08/27/76 and Vol. 44, page 33476, 06/11/79]

Monitor Labs/Lear Siegler Model 8850 SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0779-039**

"Monitor Labs or Lear Siegler Model 8850 Fluorescent SO_2 Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with an internal time constant setting of 55 seconds, a TFE sample filter installed on the sample inlet line, with or without any of the following options: 03A Rack; 03B Slides; 05A Valves Zero/Span; 06A IZS Internal Zero/Span Source; 06B,C,D NIST-Traceable Permeation Tubes; 08A Pump; 09A Rack Mount For Option 08A; 010 Status Output W/Connector; 013 Recorder Output Options; 014 DAS Output Options; 017 Low Flow Option; 018 Kicker. [*Federal Register:* Vol. 44, page 44616, 07/30/79]

Monitor Labs/Lear Siegler Model 8850S SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0390-075**

"Monitor Labs or Lear Siegler Model 8850S SO_2 Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm.

[*Federal Register:* Vol. 55, page 5264, 02/14/90]

Opsis Model AR 500 and System 300 Open Path Ambient Air Monitoring Systems for SO_2 *Automated Equivalent Method:* **EQSA-0495-101**

"Opsis Model AR 500 System" or "System 300" Open Path (long path) Ambient Air Monitoring Systems, configured for measuring SO_2, with one detector and movable grating, operated with a measurement range of 0 to 0.5 ppm or 0 to 1.0 ppm, an installed monitoring path length between 20 and 500 meters (or 20 and 1000 meters with the ER 150 option, AR 500 System only), xenon lamp type B (150 watt), fiber optic cable length between 3 to 20 meters; operating within an ambient air temperature range of -50 to +50°C, an analyzer temperature range of 20 to 30°C, a measurement (integrating) time setting between 30 and 120 seconds (0 min:30 sec. to 2 min:00 sec.), and with a complete cycle time of not more than 200 seconds (3 min, 20 sec.). Under this method designation, the Model AR 500 System or System 300 consists of: AR 500 opto-analyser; emitter EM 110 and receiver RE 110 (together identified as ER 110); optic fibre cable OF60-S; power supply PS 150; OPSIS operational software, version 7.0 or 7.1; and initial on-site installation, setup, and limited operator training.[2]

Optional components that can be used with the Model AR 500 only, in addition to or as alternative to corresponding components listed above: • AR 503 opto-analyzer configured as Model AR 500 (only the center detector active, sequential monitoring) • Emitter/receiver ER 150 (for monitoring path lengths up to 1 kilometer) • Transceiver ER 130 and Retroreflector RE 090 with 7 prisms (max. monitoring path length 150 meters) or 12 prisms (max. monitoring path length 250 meters) • Receiver RE 130 • Xenon lamp type A (higher short-wavelength UV output) • Optic fibre cable OF60-R (low-loss for short wavelengths) • Multiplexers MX 004 and MX 024 • Dataloggers DL 010 and DL 016 • Analogue and digital input/output cards AO 008, AI 016, and DI 032 • Analogue and digital isolation cards IA 008, ID 008, OA 008, and OD 008 • Window heaters HF 110 and HF 150

• Mirror heaters HM 110 and HM 150 • Auto calibration unit CU 007 • Software packages IO 80 (for the analogue and digital input/output adapters), DL10 and DL16 (for data loggers), COMVISION, and STAT 500;
Recommended calibration and accuracy audit components (or equivalent) for either Model AR 500 or System 300:
• Wavelength calibration lamp CA 004 • Calibration bench CB 100 • Receiver unit RE 060 (two required) • Calibration unit CA 150, with same type lamp as used in the monitoring path emitter • Power supply PS 150 for calibration unit CA 150 • Calibration cells CC 001-X, where X represents various cell lengths from 1 to 900 mm • Special calibration cells CC 110 or CC 150 (for mounting directly on receiver) • Light meter LM 010. [*Federal Register*: Vol. 60, page 21518, 05/02/1995]

Philips PW9755 SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0676-010**
"Philips PW9755 SO_2 Analyzer,"consisting of the following components: PW9755/02 SO_2 Monitor with PW9741/00 SO_2 Source, PW9721/00 Filter Set SO_2, PW9711/00 Electrolyte SO_2, PW9750/00 Supply Cabinet, PW9750/10 Supply Unit/Coulometric, either PW9731/00 Sampler or PW9731/20 Dust Filter (or vendor-approved alternate particulate filter); operated with a 0-0.5 ppm range and with a reference voltage setting of 760 millivolts; with or without any of the following options: PW9750/30 Frame For MTT; PW9752/00 Air Sampler Manifold; PW9753/00 Mounting Rack For Accessories; PW9750/41 Control Clock 60 Hz; PW9754/00 Air Distributor.
[*Federal Register:* Vol. 41, page 26252, 6/25/76; Vol. 41, page 46019, 10/19/76; Vol. 42, page 28571, 6/03/77]

Philips PW9700 SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0876-011**
"Philips PW9700 SO_2 Analyzer," consisting of the following components: PW9710/00 Chemical Unit with PW9711/00, Electrolyte SO_2, PW9721/00 Filter Set SO_2, PW9740/00 SO_2 Source; PW9720/00 Electrical Unit; PW9730/00 Sampler Unit (or vendor-approved alternate particulate filter); operated with a 0-0.5 ppm range and with a reference voltage of 760 millivolts.
[*Federal Register:* Vol. 41, page 34105, 08/12/76]

SIR S.A. Model S-5001 U.V. Fluorescence SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0507-166**
"SIR S.A. Model S-5001 U.V. Fluorescence SO_2 Analyzer," operated with a full-scale measurement range of 0 - 0.5 ppm, with an integration time setting of 1 minute, and with or without an optional PCMCIA card or the optional Internal permeation oven.[2]
[*Federal Register:* Vol. 72, page 26627, 05/10/07]

Teledyne - Advanced Pollution Instrumentation, Inc. Models 100A, 100AS, 100E, 100EU;
Teledyne Analytical Instruments Model 6400A; or
Teledyne Monitor Labs sensor-e™ Model TML-50 SO_2 Analyzers *Automated Equivalent Method*: **EQSA-0495-100**
"Teledyne - Advanced Pollution Instrumentation, Inc. Models 100A, 100AS, 100E or 100EU; Teledyne Analytical Instruments Model 6400A; or Teledyne Monitor Labs, Inc. sensor-e™ Model TML-50 UV Fluorescent Sulfur Dioxide Analyzer;" operated on any full scale range between 0-50 ppb[1] and 0-1000 ppb, at any temperature in the range of 5 to 40 degrees C, with a TFE filter element installed in the filter assembly, with either the vendor-supplied internal pump or a user- or vender-supplied external vacuum pump capable of maintaining an absolute pressure of 35 cm (14 inches) of mercury (or less) at 1.0 standard liter per minute flow rate, with the following software settings: Dynamic zero: OFF or ON; Dynamic span: OFF; AutoCal: ON or OFF; Dual range: ON or OFF; Autorange: ON or OFF; Temp/pressure compensation: ON; dilution factor: OFF or 1.0; and with or without any of the following options (if available for the various models):[2] Rack mount with or without chassis slides; Fluorocarbon zero/span valves; Internal zero/span (IZS); Three-point internal zero/span (IZS, option 51C); 4-20 mA, isolated analog outputs; External pump; Status outputs; Control inputs; Rack mount for external pump with tray; RS-232 output; Ethernet output; Zero air scrubber; Combustion Filter; SO_2 Permeation tube, certified or uncertified, 0.4 ppm @ 0.7 L/min; SO_2 Permeation tube, certified or uncertified, 0.8 ppm @ 0.7 L/min.
[*Federal Register*: Vol.. 60, page 17061, 04/04/95]

Teledyne Monitor Labs/Casella/Ecotech Model ML9850/EC9850/EC9850T; *Automated Equivalent Method:* **EQSA-0193-092**
Teledyne Monitor Labs/Casella/Ecotech/Model ML9850B/EC9850B, or Wedding & Associates Model 1040 SO_2 Analyzers
"Teledyne Monitor Labs, Casella Monitor, or Ecotech Models ML9850/EC9850, or ML9850B/EC9850B, Ecotech Model EC9850T, or Wedding & Associates, Inc. Model 1040 Sulfur Dioxide Analyzers," operated on any full scale range between 0-0.050 ppm[1] and 0-1.0 ppm, at any temperature in the range of 15°C to 35°C, with the service switch on the secondary panel set to the *In* position; with the following menu choices selected: Range: *0.05 ppm to 1.0 ppm*; Over-ranging: *Enabled* or *Disabled*; Background: *Not Disabled*; Calibration: *Manual* or *Timed*; Diagnostic Mode: *Operate*; Filter Type: *Kalman*; Pres/Temp/Flow Comp: *On*; Span Comp: *Disabled*; and as follows: **Model ML9850/EC9850/EC9850T** - with a five-micron Teflon® filter element installed internally, with the 50-pin I/O board installed on the rear panel configured at any of the following output range settings: Voltage, 0.1 V, 1 V, 5 V, 10 V; Current, 0-20 mA, 2-20 mA, 4-20 mA; and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Rack Mount Assembly; Internal Floppy Disk Drive. **Models ML9850B/EC9850B and 1040** - with either a vendor-supplied or equivalent user supplied five-micron Teflon® filter, zero air scrubber, and exhaust pump, and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Rack Mount Assembly; 50-pin I/O board; Exhaust Scrubber; Internal Zero/Span Assembly (IZS); hinged, fold-down front panel. [*Federal Register:* Vol. 58, page 6964, 02/03/93]

Thermo Electron Model 43 SO_2 Analyzer *Automated Equivalent Method:* **EQSA-0276-009**

"Thermo Electron Model 43 Pulsed Fluorescent SO_2 Analyzer," equipped with an aromatic hydrocarbon cutter and operated on a range of either 0-0.5 or 0-1.0 ppm, with or without any of the following options: 001 Rack Mounting For Standard 19 Inch Relay Rack; 002 Automatic Actuation Of Zero And Span Solenoid Valves; 003 Type S Flash Lamp Power Supply; 004 Low Flow.

[*Federal Register:* Vol. 41, page 8531, 02/27/76; Vol. 41, page 15363, 04/12/76; Vol. 42, page 20490, 04/20/77 Vol. 44, page 21861, 04/12/79; Vol. 45, page 2700, 01/14/80; Vol. 45, page 32419, 05/16/80]

Thermo Environmental Instruments, Inc. / Thermo Electron
Models 43A, 43B, 43C, 43C-TLE, 43*i*, 43i-TLE SO_2 Analyzers *Automated Equivalent Method:* **EQSA-0486-060**

"Thermo Electron or Thermo Environmental Instruments, Inc. **Model 43A or 43B** Pulsed Fluorescence SO_2 Analyzer," operated on the 0-0.1 ppm[1], the 0-0.2 ppm[1], the 0-0.5 ppm, or the 0-1.0 ppm range, with either a high or a low time constant setting (Model 43A) and with or without any of the following options:[2]

001 Teflon Particulate Filter	004 High Flow Rate (1 LPM)	007 Remote Activation Of Zero/Span Valves
002 19" Rack Mounting Configuration	005 Current Output	008 RS-232 Interface (Model 43B)
003 Internal Zero/Span Valves	006 Internal Permeation Span Source	009 Pressure/Temperature Compensation (Model 43B)

"Thermo Environmental Instruments, Inc. **Models 43C, 43C-TLE, 43*i*, 43*i-TLE***, Pulsed Fluorescence SO_2 Analyzer," operated on any measurement range between 0-50 ppb[1] (0-10[1] ppb for Model TLE) and 0-1000 ppb, with any time average setting from 10 to 300 seconds, with temperature and/or pressure compensation on or off, operated at temperatures between 20 °C and 30 °C, and with or without any of the following options:[2] Teflon particulate filter, 4-20 mA current output or I/O expansion board, Rack mounts, Internal permeation span source/Permeation oven, Internal zero/span and sample solenoid valves, High flow rate (0.5-1.0 LPM); **Models 43C, 43C-TLE:** Remote activation of zero/span and sample valves, RS-232/485 interface. [*Federal Register:* Vol. 51, page 12390, 04/10/86]

OZONE

Beckman Model 950A Ozone Analyzer *Automated Reference Method:* **RFOA-0577-020**

"Beckman Model 950A Ozone Analyzer," operated on a range of 0-0.5 ppm and with the "SLOW" (60 second) response time, with or without any of the following options: Internal Ozone Generator; Computer Adaptor Kit; Pure Ethylene Accessory.

[*Federal Register:* Vol. 42, page 28571, 06/03/77]

Bendix or Combustion Engineering Model 8002 Ozone Analyzer *Automated Reference Method:* **RFOA-0176-007**

"Bendix or Combustion Engineering Model 8002 Ozone Analyzer", operated on the 0-0.5 ppm range, with a 40 second time constant, with or without any of the following options: Rack Mounting With Chassis Slides; Rack Mounting Without Chassis Slides; Zero And Span Timer; Ethylene/CO_2 Blend Reactant Gas.[*Federal Register:* Vol. 41, page 5145, 02/04/76 and Vol. 45, page 18474, 03/21/80]

Columbia Scientific Industries Model 2000 Ozone Meter *Automated Reference Method:* **RFOA-0279-036**

"Columbia Scientific Industries Model 2000 Ozone Meter," when operated on the 0-0.5 ppm range with either AC or battery power: The BCA 952 battery charger/AC adapter M952-0002 (115V) or M952-0003 (230V) is required for AC operation; an internal battery M952-0006 or 12 volt external battery is required for portable non-AC powered operation.

[*Federal Register:* Vol. 44, page 10429, 02/20/79]

Dasibi Models 1003-AH, 1003-PC, or 1003-RS Ozone Analyzers *Automated Equivalent Method:* **EQOA-0577-019**

"Dasibi Model 1003-AH, 1003-PC, or 1003-RS Ozone Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with or without any of the following options: Adjustable Alarm; Aluminum Coated Absorption Tubes, Integrated Output; Vycor-Jacketed U.V. Source Lamp; BCD Digital Output; Rack Mounting Ears And Slides; 0-10 mV, 0-100 mV, 0-1 V, Or 0-10 V; Glass (Pyrex) Absorption Tubes; Teflon-based Solenoid Valve; Analog Output. [*Federal Register:* Vol. 42, page 28571, 06/03/77]

Dasibi Models 1008-AH, 1008-PC, or 1008-RS Ozone Analyzers *Automated Equivalent Method:* **EQOA-0383-056**

"Dasibi Model 1008-AH, 1008-PC, or 1008-RS Ozone Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with or without any of the following options: Aluminum Coated Absorption Tubes; BCD Digital Output; RS232 Interface; Glass (Pyrex) Absorption Tubes; Vycor-Jacketed U.V. Source Lamp; Ozone Generator; Teflon-based Solenoid Valve; Photometer Flow Restrictor (2 LPM); 4-20 mA, Isolated, Or Dual Analog Outputs; Rack Mounting Brackets Or Slides; 20 Second Update Software.

[*Federal Register:* Vol. 48, page 10126, 03/10/83]

DKK-TOA Corp. Model GUX-113E Ozone Analyzer *Automated Equivalent Method:* **EQOA-0200-134**
"DKK-TOA Corporation Models GUX-113E and GUX-113E-1 Ozone Analyzer," operated at any temperature in the range of 15° C to 35° C, on any of the following measurement ranges: 0-0.100 ppm[1], 0-0.200 ppm[1], 0-0.5 ppm, or 0-1.000 ppm, and with or without the optional Internal Ozone Generator.[2] [*Federal Register:* Vol. 65, page 11308, 03/02/00]

DKK-TOA Corp. Model GUX-313E Ambient O_s Analyzer *Automated Equivalent Method:* **EQOA-1107-169**
"DKK-TOA Corporation Model GUX-313E Ambient O_3 Analyzer," operated at any environmental temperature in the range of 20 °C to 30 °C on any of the following measurement ranges[1]: 0-0.1 ppm, 0-0.2 ppm and 0-0.5 ppm.[2]
[*Federal Register:* Vol. 72, page 63176, 11/08/07]

Environics Series 300 Ozone Analyzer *Automated Equivalent Method:* **EQOA-0990-078**
"Environics Series 300 Computerized Ozone Analyzer," operated on the 0-0.5 ppm range, with the following parameters entered into the analyzer's computer system: Absorption Coefficient = *308 ± 4*; Flush Time = *3*; Integration Factor = *1*; Offset Adjustment = *0.025 ppm*; Ozone Average Time = *4*; Signal Average = *0*; Temp/Press Correction = *On*; and with or without the RS-232 Serial Data Interface.
[*Federal Register:* Vol. 55, page 38386, 09/18/90]

Environnement S.A. Model $O_3$41M UV Ozone Analyzer *Automated Equivalent Method:* **EQOA-0895-105**
"Environnement S.A. Model $O_3$41M UV Photometric Ozone Analyzer," operated on a full scale range of 0 - 500 ppb, at any temperature in the range of 15 °C to 35 °C, with the response time set to 50 seconds, and with or without any of the following options:[2] Internal Ozone Generator; Span External Control; RS232-422 Serial Interface; Internal Printer.
[*Federal Register*: Vol.. 60, page 39382, 08/02/95]

Environnement S.A. Model $O_3$42M UV Ozone Analyzer *Automated Equivalent Method:* **EQOA-0206-148**
"Environnement S.A Model $O_3$42M UV Photometric Ozone Analyzer," operated with a full scale range of 0 - 500 ppb, at any temperature in the range of 10 °C to 35 °C, with a 5-micron PTFE sample particulate filter, with response time setting of 11 (Automatic response time), and with or without any of the following options:[2] c) Internal ozone generator, d) Span external control (zero/span solenoid valve).
[*Federal Register*: Vol. 67, page 42557, 06/24/02]

Environnement S.A. SANOA Multigas Longpath Monitoring System *Automated Equivalent Method:* **EQOA-0400-137**
"Environnement S.A. Model SANOA Multigas Longpath Air Quality Monitoring System, consisting of a receiver, one or more projectors, interface unit, a user-provided control unit computer running the SANOA VisionAIR software, and associated incidental equipment; configured for measuring O_3, with the temperature control and internal calibration cell options installed, operated with a measurement range of 0 to 0.5 ppm, over an installed monitoring path length of between 27 and 500 meters, within an ambient air temperature range of -30 to +45°C, with a measurement (integrating) time of 180 seconds, and with or without external temperature and barometric pressure sensors or any of the following options: external (meteo) input connection, series 1M bus connection, OGR type projector, analog outputs. A high-concentration ozone generator, part # 80-231-03, or the SONIMIX 7121B calibration system is recommended for calibration or accuracy auditing [*Federal Register*: Vol. 65, page 26603, 05/08/00]

Horiba Instruments Models APOA-360 or APOA-360-CE Ozone Monitor *Automated Equivalent Method:* **EQOA-0196-112**
"Horiba Instruments, Inc. Model APOA-360 or APOA-360-CE Ambient Ozone Monitor," operated with a full scale range of 0 - 0.50 ppm, at any temperature in the range of 10°C to 40°C, with a Line Setting of "MEASURE", and an Analog Output of "MOMENTARY VALUE", and with or without any of the following options:[2] 1) Rack Mounting Plate and Side Rails 2) RS-232 Communications Port, and 3) Optional Internal Zero/Span Check [*Federal Register*: Vol. 61, page 11404, 03/20/96]

Horiba Instruments Model APOA-370 Ozone Monitor *Automated Equivalent Method:* **EQOA-0506-160**
"Horiba Instruments Incorporated APOA-370 Ambient O_3 Monitor," standard specification, operated with a full-scale fixed measurement range of 0 - 0.5 ppm, with the automatic range switching off, at any temperature in the range of 20 to 30 °C.[2]
[*Federal Register*: Vol. 71, page 25587, 05/01/06]

McMillan (MEC) Models 1100-1, 1100-2, and 1100-3 Ozone Meters
"MEC Model 1100-1 Ozone Meter," *Automated Reference Method*: **RFOA-1076-014**
"MEC Model 1100-2 Ozone Meter," *Automated Reference Method:* **RFOA-1076-015**
"MEC Model 1100-3 Ozone Meter," *Automated* Reference Method: **RFOA-1076-016**
operated on a 0-0.5 ppm range, with or without any of the following options: 0011 Rack Mounting Ears; 0026 Alarm Set Feature; 0012 Instrument Bail; 0033 Local-Remote Sample; Zero, Span Kit Blend Feature; 0016 Chassis Slide Kit; 0040 Ethylene/CO_2.
[*Federal Register:* Vol. 41, page 46647, 10/22/76 and Vol. 42, page 30235, 06/13/77]

Meloy Model OA325-2R Ozone Analyzer *Automated Reference Method:* **RFOA-1075-003**
"Meloy Model OA325-2R Ozone Analyzer," operated with a scale range of 0-0.5 ppm, with or without any of the following options: 0-4 Output Booster Amplifier; 0-18 Rack Mount Conversion; 0-18A Rack Mount Conversion.
[*Federal Register:* Vol. 40, page 54856, 11/26/75]

Meloy Model OA350-2R Ozone Analyzer *Automated Reference Method:* **RFOA-1075-004**
"Meloy Model OA350-2R Ozone Analyzer," operated with a scale range of 0-0.5 ppm, with or without any of the following options: 0-2 Automatic Zero And Span; 0-3 Remote Control Zero And Span; 0-4 Output Booster Amplifier; 0-18 Rack Mount Conversion; 0-18A Rack Mount Conversion. [*Federal Register:* Vol. 40, page 54856, 11/26/75]

Monitor Labs Model 8410E Ozone Analyzer *Automated Reference Method:* **RFOA-1176-017**
"Monitor Labs Model 8410E Ozone Analyzer," operated on a range of 0-0.5 ppm with a time constant setting of 5 seconds, with or without any of the following options: DO Status Outputs; ER Ethylene Regulator Assembly; V TFE Zero/Span Valves; TF TFE Sample Particulate Filter; VT TFE Zero/Span Valves And Timer. [*Federal Register:* Vol. 41, page 53684, 12/08/76]

Monitor Labs/Lear Siegler Model 8810 Ozone Analyzer *Automated Equivalent Method:* **EQOA-0881-053**
"Monitor Labs or Lear Siegler Model 8810 Photometric Ozone Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with selectable electronic time constant settings from 20 through 150 seconds, with or without any of the following options: 05 Pressure Compensation; 06 Averaging Option; 07 Zero/Span Valves; 08 Internal Zero/Span (Valve And Ozone Source); 09 Status; 10 Particulate Filter; 15 through 20 DAS/REC Output. [*Federal Register:* Vol. 46, page 52224, 10/26/81]

Opsis Model AR 500 and System 300 Open Path Ambient Air Monitoring Systems for Ozone *Automated Equivalent Method:* **EQOA-0495-103**
"Opsis Model AR 500 System" or "System 300" Open Path (long path) Ambient Air Monitoring Systems, configured for measuring O_3, with one detector and moveable grating, operated with a measurement range of 0 to 0.5 ppm, an installed monitoring path length between 20 and 500 meters (or 20 and 1000 meters with the ER 150 option, AR 500 System only), xenon lamp type B (150 watt), fiber optic cable length between 3 to 20 meters; operating within an ambient air temperature range of -50 to +50°C, an analyzer temperature range of 20 to 30°C, a measurement (integrating) time setting between 30 and 120 seconds (0 min:30 sec. to 2 min:00 sec.), and with a complete cycle time of not more than 200 seconds (3 min, 20 sec.). Under this method designation, the Model AR 500 System or System 300 consists of: AR 500 opto-analyser; emitter EM 110 and receiver RE 110 (together identified as ER 110); optic fibre cable OF60-S; power supply PS 150, OPSIS operational software, version 7.0 or 7.1; and initial on-site installation, setup, and limited operator training.[2]
Optional components that can be used with the Model AR 500 only, in addition to or as alternative to corresponding components listed above: • AR 503 opto-analyzer configured as Model AR 500 (only the center detector active, sequential monitoring) • Emitter/receiver ER 150 (for monitoring path lengths up to1 kilometer) • Transceiver ER 130 and Retroreflector RE 090 with 7 prisms (max. monitoring path length 150 meters) or 12 prisms (max. monitoring path length 250 meters) • Receiver RE 130 • Optic fibre cable OF60-R (low-loss for short wavelengths) • Multiplexers MX 004 and MX 024 • Dataloggers DL 010 and DL 016 • Analogue and digital input/output cards AO 008, AI 016, and DI 032 • Analogue and digital isolation cards IA 008, ID 008, OA 008, and OD 008 • Window heaters HF 110 and HF 150 • Mirror heaters HM 110 and HM 150 • Auto calibration unit CU 007 • Software packages IO 80 (for the analogue and digital input/output adapters), DL10 and DL16 (for data loggers), ComVision, and STAT 500;
Recommended calibration and accuracy audit components (or equivalent) for either Model AR 500 or System 300:
• Wavelength calibration lamp CA 004 • Calibration bench CB 100 • Receiver unit RE 060 (two required) • Calibration unit CA 150, with same type lamp as used in the monitoring path emitter • Power supply PS 150 for calibration unit CA 150 • Calibration cells CC 001-X, where X represents various cell lengths from 1 to 900 mm • Special calibration cells CC 110 or CC 150 (for mounting directly on receiver) • Ozone generator OC 500 • Light meter LM 010.
Federal Register: Vol. 60, page 21518, 05/02/1995]

PCI Ozone Corporation Model LC-12 Ozone Analyzer *Automated Equivalent Method:* **EQOA-0382-055**
"PCI Ozone Corporation Model LC-12 Ozone Analyzer," operated on a range of 0-0.5 ppm.
[*Federal Register:* Vol. 47, page 13572, 03/31/82]

Philips PW9771 0_3 Analyzer *Automated Equivalent Method:* **EQOA-0777-023**
"Philips PW9771 03 Analyzer," consisting of the following components: PW9771/00 03 Monitor with PW9724/00 Disc.-Set; PW9750/00 Supply Cabinet; PW9750/20 Supply Unit operated on a range of 0-0.5 ppm, with or without any of the following accessories: PW9732/00 Sampler Line Heater; PW9750/30 Frame For MTT; PW9750/41 Control Clock 60 Hz; PW9733/00 Sampler; PW9752/00 Air Sampler Manifold. [*Federal Register:* Vol. 42, page 38931, 08/01/77; Vol. 42, page 57156, 11/01/77]

Seres Model OZ 2000 G Ozone Analyzer *Automated Equivalent Method:* **EQOA-0506-161**

"Seres OZ 2000 G Ozone Ambient Air Analyzer," operated with a full scale range of 0 - 0.5 ppm, at any temperature in the range of 20 °C to 30 °C, and with or without either of the following options: internal ozone generator, teletransmission interface.[2]

[*Federal Register*: Vol. 71, page 25587, 05/01/06]

SIR S.A. Model S-5014 O_3 Analyzer *Automated Equivalent Method:* **EQOA-0207-164**

"SIR S.A. Model S-5014 Photometric O_3 Analyzer," operated on the 0 - 500 ppb measurement range, within an ambient temperature range of 20 °C to 30 °C, with a sample inlet particulate filter, and with or without an optional PCMCIA card.

[*Federal Register*: Vol. 72, page 8985, 02/28/07]

Tanabyte Models 722, 723, 724, 725, or 726 Ambient Ozone Analyzer *Automated Equivalent Method:* **EQOA-0407-165**

"Tanabyte Models 722,723, 724, 725, or 726 Ambient Ozone Analyzer," enclosed in either a Dual-Bay Chassis or a Single-Bay Chassis and operated on either the 0 - 0.5 ppm or 0 - 1.0 ppm measurement range, within an ambient temperature range of 20 to 30 degrees C, and with a sample inlet particulate filter installed in the sample filter holder. [*Federal Register*: Vol. 72, page 20846, 04/26/07]

Teledyne - Advanced Pollution Instrumentation, Inc. Model 400E;
Advanced Pollution Instrumentation, Inc. Model 400/400A;
Teledyne Monitor Labs sensor-e™ Model TML-10 Ozone Analyzers *Automated Equivalent Method:* **EQOA-0992-087**

"Teledyne - Advanced Pollution Instrumentation, Inc. Model 400E; Advanced Pollution Instrumentation, Inc. Model 400 or 400A; or Teledyne Monitor Labs sensor-e™ Model TML-10 Ozone Analyzer;" operated on any full scale range between 0-100 ppb[1] and 0-1000 ppb, with any range mode (Single, Dual, or AutoRange), at any ambient temperature in the range of 5°C to 40°C, and with a TFE filter. **Models 400E and TML-50:** operated with a sample flow rate of 800 ±80 cm^3/min (sea level), with the dilution factor set to 1, with Dynamic Zero ON or OFF, with Dynamic Span OFF, with Temp/Press compensation ON, and with or without any of the following options: Internal or external sample pump, Sample/Cal valve option, Internal Zero/Span (IZS), Rack mount with or without slides, 4-20 mA isolated current loop output.[2] **Models 400/400A:** operated with the dynamic zero and span adjustment feature (some Model 400 units only) set to OFF, and with or without any of the following options: Zero/Span Valve option, Internal Zero/Span (IZS) option, IZS ozone generator reference feedback option, standard serial port or Multi-drop RS-232, digital status outputs, analog outputs: 100 mV, 1 V, 5 V, 10 V, 4-20 mA current loop, optional metal wool ozone scrubber, optional external sample pump, optional 47 mm diameter filter, optical bench heater, rack mount with slides.

[*Federal Register:* Vol. 57, page 44565, 09/28/92; Vol. 63, page 31992, 06/11/98; *Federal Register:* Vol. 67, page 57811, 09/12/02]

Teledyne Monitor Labs/Casella/Ecotech Models ML9810/EC9810, -11, or -12,
Teledyne Monitor Labs/Casella/Ecotech Model ML9810B/EC9810B, or
Wedding & Associates Model 1010 Ozone Analyzers *Automated Equivalent Method:* **EQOA-0193-091**

"Teledyne Monitor Labs, Casella Monitor, or Ecotech Models ML9810/EC9810, ML9811/EC9811, ML9812/EC9812, or ML9810B/EC9810B or Wedding & Associates, Inc. Model 1010 Ozone Analyzers," operated on any full scale range between 0-0.05 ppm[1] and 0-1.0 ppm, at any temperature in the range of 15°C to 35°C, with the service switch on the secondary panel set to the *In* position; with the following menu choices selected: Range: *0.05 ppm* to *1.0 ppm;* Over-ranging: *Enabled* or *Disabled*; Calibration: *Manual* or *Timed*; Diagnostic Mode: *Operate*; Filter Type: *Kalman*; Pres/Temp/Flow Comp: *On*; Span Comp: *Disabled*; and as follows: **Models ML9810/EC9810, -9811, and -9812** - with a five-micron Teflon® filter element installed internally, with the 50-pin I/O board installed on the rear panel configured at any of the following output range settings: Voltage, 0.1 V, 1 V, 5 V, 10 V; Current, 0-20 mA, 2-20 mA, 4-20 mA; and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Rack Mount Assembly; Internal Floppy Disk Drive. **Models ML9810B/EC9810B and 1010** - with either a vendor-supplied or equivalent user-supplied five micron Teflon® filter and exhaust pump, and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Rack Mount Assembly; 50-pin I/O board; Internal Zero/Span Assembly (IZS); hinged, fold-down front panel.

[*Federal Register:* Vol. 58, page 6964, 02/03/93]

Thermo Electron/Thermo Environmental Instruments Models 49, 49C, 49*i* *Automated Equivalent Method:* **EQOA-0880-047**

"Thermo Electron or Thermo Environmental Instruments, Inc. **Model 49** U.V. Photometric Ambient O_3 Analyzer" operated on a measurement range of either 0-0.5 or 0-1.0 ppm with or without any of the following options: 49-001 Teflon Particulate Filter; 49-002 19 Inch Rack Mount; 49-100 Internal Ozone Generator for Zero, Precision, and Level 1 Span Check; 49-103 Internal Ozone Generator for Zero, Precision, and Level 1 Span Checks With Remote Activation; 49-488 GPIB (General Purpose Interface Bus) IEEE-488.

"Thermo Electron or Thermo Environmental Instruments, Inc. **Model 49C or 49*i*** U.V. Photometric Ambient O_3 Analyzer" operated on any measurement range between 0-0.05[1] to 1.0 ppm, with any time average setting between 10 and 300 seconds, with the temperature and/or pressure compensation on or off, within a temperature range of 20 °C to 30 °C, with or without any of the following options: [2] Teflon particulate filter, Internal Zero Air Scrubber, Internal Ozonator with remote activation, Rack mounts; **Model 49C**: Internal Ozonator, Carrying Handle, 4-20 mA current output, RS-232 Interface, RS-485 Interface; **Model 49i**: I/O expansion board.

[*Federal Register:* Vol. 45, page 57168, 08/27/80]

CARBON MONOXIDE

Beckman Model 866 CO Monitoring System *Automated Reference Method:* **RFCA-0876-012**

"Beckman Model 866 Ambient CO Monitoring System," consisting of the following components: Pump/Sample-Handling Module; Gas Control Panel; Model 865-17 Analyzer Unit; Automatic Zero/Span Standardizer; operated with a 0-50 ppm range, a 13 second electronic response time, with or without any of the following options: Current Output Feature; Bench Mounting Kit; Linearizer Circuit.

[*Federal Register:* Vol. 41, page 36245, 08/27/76]

Bendix/Combustion Engineering Model 8501-5CA CO Analyzer *Automated Reference Method:* **RFCA-0276-008**

"Bendix or Combustion Engineering Model 8501-5CA Infrared CO Analyzer", operated on the 0-50 ppm range and with a time constant setting between 5 and 16 seconds, with or without any of the following options: Rack Mounting With Chassis Slides; Rack Mounting Without Chassis Slides; External Sample Pump. [*Federal Register:* Vol. 41, page 7450, 02/18/76]

Dasibi Model 3003 CO Analyzer *Automated Reference Method:* **RFCA-0381-051**

"Dasibi Model 3003 Gas Filter Correlation Dasibi Environmental CO Analyzer," operated on the 0-50 ppm range, with a sample particulate filter installed on the sample inlet line, with or without any of the following options:

3-001 Rack Mount 3-003 BCD Digital Output 3-007 Zero/Span Module Panel
3-002 Remote Zero And Span 3-004 4-20 Milliamp Output [*Federal Register:* Vol. 46, page 20773, 04/07/81]

Dasibi Model 3008 CO Analyzer *Automated Reference Method:* **RFCA-0488-067**

"Dasibi Model 3008 Gas Filter Correlation CO Analyzer," operated on the 0-50 ppm range, with a time constant setting of 60 seconds, a particulate filter installed in the analyzer sample inlet line, with or without use of the auto zero or auto zero/span feature, and with or without any of the following options: N-0056-A RS-232-C Interface; S-0132-A Rack Mounting Slides; Z-0176-S Rack Mounting Brackets. [*Federal Register:* Vol. 53, page 12073, 04/12/88]

DKK-TOA Corporation Model GFC-311E Ambient CO Analyzer *Automated Reference Method:* **RFCA-0907-167**

"DKK-TOA Corporation Model GFC-311E Ambient CO Analyzer," operated with full scale fixed measurement ranges of 0-5, 0-20, and 0-50 ppm at any environmental temperature in the range of 20 °C to 30 °C.

[*Federal Register:* Vol. 72, page 56339, 10/03/07]

Environnement S.A. Model CO11M CO Analyzer *Automated Reference Method:* **RFCA-0995-108**

"Environnement S.A. Model CO11M Ambient Carbon Monoxide Analyzer," operated on a full scale range of 0 - 50 ppm, at any temperature in the range of 15 °C to 35 °C, with a 5-micron PTFE sample particulate filter, with the following software settings: Automatic response time ON; Minimum response time set to 40 seconds (RT 13); Automatic ZERO-REF cycle programmed every 24 hours; and with or without any of the following options: [2] RS232-422 Serial Interface; Internal Printer.

[*Federal Register*: Vol. 60, page 54684, 10/25/95]

Environnement S.A. Model CO12M CO Analyzer *Automated Reference Method:* **RFCA-0206-147**

"Environnement S.A Model CO12M Gas Filter Correlation Carbon Monoxide Analyzer," operated with a full scale range of 0 - 50 ppm, at any temperature in the range of 10 °C to 35 °C, with a 5-micron PTFE sample particulate filter, with response time ON, and with the automatic "ZERO-REF" cycle either ON or OFF.[2] [*Federal Register*: Vol. 67, page 42557, 06/24/02]

Horiba Models AQM-10, AQM-11, or AQM12 CO Monitoring Systems *Automated Reference Method:* **RFCA-1278-033**

"Horiba Models AQM-10, AQM-11, or AQM12 Ambient CO Monitoring Systems," operated on the 0-50 ppm range, with a response time setting of 15.5 seconds, with or without any of the following options: AIC-101 Automatic Indication Corrector; VIT-3 Non-Isolated Current Output; ISO-2 And DCS-3 Isolated Current Output. [*Federal Register:* Vol. 43, page 58429, 12/14/78]

Horiba Model APMA-300E CO Monitoring System *Automated Reference Method:* **RFCA-1180-048**

"Horiba Model APMA-300E Ambient Carbon Monoxide Monitoring System," operated on the 0-20 ppm[1], the 0-50 ppm, or the 0-100 ppm range with a time constant switch setting of No. 5. The monitoring system may be operated at temperatures between 10°C and 40°C. (This method was originally designated as "Horiba Model APMA 300E/300SE Ambient Carbon Monoxide Monitoring System".)

[*Federal Register:* Vol. 45, page 72774, 11/03/80]

Horiba Models APMA-360 or APMA-360-CE CO Monitor *Automated Reference Method:* **RFCA-0895-106**

"Horiba Instruments Incorporated, Models APMA-360 or APMA-360-CE Ambient Carbon Monoxide Monitor," operated on the 0-50 ppm range, with the Line Setting set to "MEASURE", with the Analog Output set to "MOMENTARY VALUE", and with or without the following options:[2] 1) Rack Mounting Plate and Side Rails 2) RS-232 Com Port.

[*Federal Register:* Vol. 60, page 39382, 08/02/95]

Horiba Model APMA-370 CO Monitor *Automated Reference Method:* **RFCA-0506-158**

"Horiba Instruments Incorporated Model APMA-370 Ambient CO Monitor," operated with a full scale fixed measurement range of 0 - 50 ppm, with the automatic range switching off, at any environmental temperature in the range of 20 °C to 30 °C.[2]

[*Federal Register*: Vol. 71, page 25587, 05/01/06]

MASS-CO, Model 1 CO Analyzer *Automated Reference Method:* **RFCA-1280-050**

"MASS-CO, Model 1 Carbon Monoxide Analyzer," operated on a range of 0-50 ppm, with automatic zero and span adjustments at time intervals not to exceed 4 hours, with or with out the 100 millivolt and 5 volt output options. The method consists of the following components: (1) Infra-2 (Uras 2) Infrared Analyzer Model 5611-200-35, (2) Automatic Calibrator Model 5869-111, (3) Electric Gas Cooler Model 7865-222 or equivalent with prehumidifier, (4) Diaphragm Pump Model 5861-214 or equivalent, (5) Membrane Filter Model 5862-111 or equivalent, (6) Flow Meter Model SK 1171-U or equivalent, (7) Recorder Model Mini Comp DN 1/192 or equivalent. NOTE: This method is not now commercially available. [*Federal Register:* Vol. 45, page 81650, 12/11/80]

Monitor Labs Model 8310 CO Analyzer *Automated Reference Method:* **RFCA-0979-041**

"Monitor Labs Model 8310 CO Analyzer," operated on the 0-50 ppm range, with a sample inlet filter, with or without any of the following options:

02A Zero/Span Valves	04B Pump (50 Hz)	07A Zero/Span Valve Power Supply
03A Floor Stand	05A CO Regulator	08A Calibration Valves
04A Pump (60 Hz)	06A CO Cylinder	9A,B,C,D Input Power Transformer

[*Federal Register:* Vol. 44, page 54545, 09/20/79 and Vol. 45, page 2700, 01/14/80]

Monitor Labs/Lear Siegler Model 8830 CO Analyzer *Automated Reference Method:* **RFCA-0388-066**

"Monitor Labs or Lear Siegler Model 8830 CO Analyzer," operated on the 0-50 ppm range, with a five micron Teflon filter element installed in the rear-panel filter assembly, with or without any of the following options: 2 - Zero/Span Valve Assembly; 3 - Rack Assembly; 4 - Slide Assembly; 7 - 230 VAC, 50/60 Hz. [*Federal Register:* Vol. 53, page 7233, 03/07/88]

MSA/LIRA Model 202S CO Analyzer System *Automated Reference Method:* **RFCA-0177-018**

"LIRA Model 202S Air Quality Carbon Monoxide Analyzer System," consisting of a LIRA Model 202S optical bench (P/N 459839), a regenerative dryer (P/N 464084), and rack-mounted sampling system; operated on a 0-50 ppm range, with the slow response amplifier, with or without any of the following options: Remote Meter; Remote Zero And Span Controls; 0-1, 5, 20, Or 50 mA Output; 1-5, 4-20, Or 10-50 mA Output; 0-10 Or 100 mV Output; 0-1, 5, Or 10 Volt Output. [*Federal Register:* Vol. 42, page 5748, 01/31/77]

Teledyne Advanced Pollution Instrumentation, Inc. Models 300, 300E, 300EU or Teledyne Monitor Labs sensor-e™ Model TML-30 CO Analyzer *Automated Reference Method:* **RFCA-1093-093**

"Teledyne Advanced Pollution Instrumentation, Inc. Models 300, 300E, or 300EU, or Teledyne Monitor Labs, Inc. sensor-e™ Model TML-30, Gas Filter Correlation Carbon Monoxide Analyzer," operated on any full scale range between 0-10 ppm and 0-50 ppm (0 - 0.1 ppm for **Model 300EU**), at any temperature in the range of 15°C to 35°C for **Model 300** or 10°C to 40°C for **Models 300E, 300 EU, and TML-30**, with a 5-micron TFE filter element installed in the sample filter assembly, with the dynamic zero and span adjustment set to *Off* for **Model 300**, and with or without any of the following options[2]: Option 50, Zero/Span Valves with pressurized span gas and shutoff valve; Option 51, Zero/Span Valves with pressurized span gas and shutoff valve and Internal Zero Air Generator; Option 52, Zero/Span Valves; Option 53, Zero/Span Valves with Internal Zero Air Generator; Rack Mount with slides; RS-232 serial port with status outputs; and (for **Models 300E, 300EU and TML-30**) 4-20 mA isolated outputs.

[*Federal Register:* Vol. 58, page 58166, 10/29/93]

Teledyne Monitor Labs/Casella/Ecotech Model ML9830/EC9830/EC9830T, Teledyne Monitor Labs/Casella/Ecotech Model ML9830B/EC9830B, or Wedding & Associates Model 1020 CO Analyzers *Automated Reference Method:* **RFCA-0992-088**

"Teledyne Monitor Labs, Casella Monitor, or Ecotech Models ML9830/EC9830 or ML9830B/EC9830B, Ecotech Model EC9830T, or Wedding & Associates, Inc. Model 1020 Carbon Monoxide Analyzer," operated on any full scale range between 0-5.0 ppm[1] and 0-100 ppm, at any temperature in the range of 15°C to 35°C, with the service switch on the secondary panel set to the *In* position, with the following menu choices selected: Range: *5.0 ppm* to *100.0* ppm; Over-ranging: *Enabled* or *Disabled;* Background: *Not Disabled*; Calibration: *Manual* or *Timed*; Diagnostic Mode: *Operate*; Filter Type: *Kalman*; Pres/Temp/Flow Comp: *On*; Span Comp: *Disabled*; and as follows: **Model ML9830/EC9830/EC9830T:** with a five-micron Teflon® filter element installed internally, with the 50-pin I/O board installed on the rear panel configured at any of the following output range settings: Voltage, 0.1 V, 1 V, 5 V, 10 V; Current, 0-20 mA, 2-20 mA and 4-20 mA; and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Valve Assembly for Internal Zero/Span (IZS); Rack Mount Assembly; Internal Floppy Disk Drive. **Models ML9830B/EC9830B and 1020**: with either a vendor-supplied or equivalent user-supplied five micron Teflon® filter and exhaust pump, and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); 50-pin I/O board; Rack Mount Assembly; High Pressure Span Valve; hinged, fold-down front panel. [*Federal Register:* Vol. 57, page 44565, 09/28/92]

Thermo Electron/Thermo Environmental Instruments Models 48, 48C, 48*i* *Automated Reference Method:* **RFCA-0981-054**

"Thermo Electron or Thermo Environmental Instruments, Inc. **Model 48** Gas Filter Correlation Ambient CO Analyzer," operated on the 0-50 ppm range, with a time constant setting of 30 seconds, with or without any of the following options:

48-001 Teflon Particulate Filter	48-010 Internal Zero Air Package
48-002 19 Inch Rack Mount	48-488 GPIB (General Purpose Interface Bus) EEEE-488
48-003 Internal Zero/Span Valves with Remote Activation	

"Thermo Electron or Thermo Environmental Instruments, Inc. **Models 48C or 48*i*** Gas Filter Correlation Ambient CO Analyzer," operated on any measurement range between 0-1 ppm[1] and 0-100 ppm, with any averaging time setting from 10 to 300 seconds, with temperature and/or pressure compensation on or off, operated at temperatures between 20 °C and 30 °C, with or without any of the following options:[2] Teflon particulate filter, Internal zero air scrubber, I/O Expansion board; **Model 48C:** Carrying handle, 4-20 mA current output, Rack mounts, RS-232 interface, Internal zero/span and sample/calibration solenoid valves, RS-485 interface, Internal zero/span and sample/calibration solenoid valves with remote I/O activation. [*Federal Register:* Vol. 46, page 47002, 09/23/81]

NITROGEN DIOXIDE

Sodium Arsenite Method for NO_2 *Manual Equivalent Method:* **EQN-1277-026**

"Sodium Arsenite Method for the Determination of Nitrogen Dioxide in the Atmosphere."

[*Federal Register:* Vol. 42, page 62971, 12/14/77]

Sodium Arsenite Method for NO_2 - Technicon II *Manual Equivalent Method:* **EQN-1277-027**

"Sodium Arsenite Method for the Determination of Nitrogen Dioxide in the Atmosphere-Technicon II Automated Analysis System."

[*Federal Register:* Vol. 42, page 62971, 12/14/77]

TGS-ANSA Method for NO_2 *Manual Equivalent Method:* **EQN-1277-028**

"TGS-ANSA Method for the Determination of Nitrogen Dioxide in the Atmosphere."

[*Federal Register:* Vol. 42, page 62971, 12/14/77]

Advanced Pollution Instrumentation, Inc. Model 200 NO_2 Analyzer *Automated Reference Method:* **RFNA-0691-082**

"Advanced Pollution Instrumentation, Inc. Model 200 Nitrogen Oxides Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with a 5-micron TFE filter element installed in the rear-panel filter assembly, with either a user- or vendor-supplied vacuum pump capable of providing 5 inches mercury absolute pressure at 5 slpm, with either a user- or vendor-supplied dry air source capable of providing air at a dew point of 0°C or lower, with the following settings of the adjustable setup variables:

Adaptive Filter = *On*	PMT Temperature Set Point = *15°C*	Normal Filter Size = *12 samples*
Dwell Time = *7 seconds*	Rate of Change(ROC) Threshold = *10%*	Dynamic Span = *Off*
Sample Time = *8 seconds*	Reaction Cell Temperature = *50°C*	Dynamic Zero = *Off*

and with or without any of the following options:

180 Stainless Steel Valves	283 Internal Zero/Span With Valves (IZS)	356 Level One Spares Kit
184 Pump Pack	325 RS-232/Status Output	357 Level Two Spares Kit
280 Rack Mount With Slides	355 Expendables	PE5 Permeation Tube for IZS

[*Federal Register:* Vol. 56, page 27014, 06/12/91]

Beckman Model 952-A $NO/NO_2/NO_x$ Analyzer *Automated Reference Method:* **RFNA-0179-034**

"Beckman Model 952-A $NO/NO_2/NO_x$ Analyzer," operated on the 0-0.5 ppm range with the 5-micron Teflon sample filter (Beckman P/N 861072 supplied with the analyzer) installed on the sample inlet line, with or without the Remote Operation Option (Beckman No. 635539). [*Federal Register:* Vol. 44, page 7806, 02/07/79]

Bendix Model 8101-B Oxides of Nitrogen Analyzer *Automated Reference Method:* **RFNA-0479-038**

"Bendix Model 8101-B Oxides of Nitrogen Analyzer," operated on a 0-0.5 ppm range with a Teflon sample filter installed on the sample inlet line and with the following post-manufacture modifications: 1) Ozone generator and reaction chamber input-output tubing modification per Bendix Service Bulletin 8101B-2; 2) The approved converter material; 3) The revised and EPA-approved operation and service manual. These items are mandatory and must be obtained from ABB Process Analytics. The analyzer may be operated with or without any of the following optional modifications: a. Perma Pure dryer/ambient air modification; b. Valve cycle time modification; c. Zero potentiometer centering modification per Bendix Service Bulletin 8101B-1; d. Reaction chamber vacuum gauge modification.

[*Federal Register:* Vol. 44, page 26792, 05/07/79]

Bendix/Combustion Engineering Model 8101-C Oxides of Nitrogen Analyzer *Automated Reference Method:* **RFNA-0777-022**

"Bendix or Combustion Engineering Model 8101-C Oxides of Nitrogen Analyzer," operated on a 0-0.5 ppm range with a Teflon sample filter (Bendix P/N 007163) installed on the sample inlet line. [*Federal Register:* Vol. 42, page 37435, 07/21/77]

Columbia Scientific Industries Models 1600 and 5600 Analyzers *Automated Reference Method:* **RFNA-0977-025**

"CSI Model 1600 Oxides of Nitrogen Analyzer," operated on a 0-0.5 ppm range with a Teflon sample filter (CSI P/N M951-8023) installed on the sample inlet line, with or without any of the following options:

951-0103 Rack Ears	951-0114 Recorder Output, 5 V
951-0104 Rack Mounting Kit (Ears & Slides)	951-0115 External Pump (115 V, 60 Hz)
951-0106 Current Output, 4-20 mA (Non-Insulated)	951-8072 Molybdenum Converter Assembly (Horizontal)
951-0108 Diagnostic Output Option	951-8074 Copper Converter Assembly (Horizontal)
951-0111 Recorder Output, 10 V	951-8079 Copper Converter Assembly (Vertical)
951-0112 Remote Zero/Span Sample Control	951-8085 Molybdenum Converter Assembly (Vertical)

NOTE: The vertical molybdenum converter assembly is standard on all new analyzers as of 1-1-87; however, use of any of the other converter assemblies is optional. Also, the above options reflect new CSI part numbers.

"CSI Model 5600 Oxides of Nitrogen Analyzer," operated on a 0-0.5 ppm range, with any signal integration time in the range of 20 to 99 seconds, with a Teflon sample filter (CSI P/N M951-8023) installed on the sample inlet line, and with or without any of the following options: 954-0121 - Status Contacts; 964-0126 - Printer; 954-0131 - Rack Mounting Kit (ears and slides); 954-0122 - Input Solenoids; 954-8024 - Cartridge Dryer; 964-0012 - Single Headed Pump - Gast; 954-0125 - Current Output, 4-20 mA; 951-0115 - Single Headed Pump - KNF [*Federal Register:* Vol. 42, page 46574, 09/16/77]

Dasibi Model 2108 Oxides of Nitrogen Analyzer *Automated Reference Method:* **RFNA-1192-089**

"Dasibi Model 2108 Oxides of Nitrogen Analyzer," operated on the 0-500 ppb range, with software revision 3.6 installed in the analyzer, with the auto thumbwheel switch and the diag thumbwheel switch settings at 0, with the following internal CPU dipswitch settings:

switch	position	function
1	open (down)	Recorder outputs are NO & NO_2
5	open (down)	3 minute time constant
6	closed (up)	3 minute time constant;

with a 5-micron Teflon filter element installed in the filter holder, and with or without any of the following options:

Built-in Permeation Oven	Rack Mounting	Three-Channel Recorder Output
RS-232 Interface	4-20 mA Output	[*Federal Register:* Vol. 57, page 55530, 11/25/92]

DKK-TOA Corporation Model GLN-114E Nitrogen Oxides Analyzer *Automated Reference Method:* **RFNA-0798-121**

"DKK-TOA Corporation Models GLN-114E and GLN-114E-1 Nitrogen Oxides Analyzer," operated within a temperature range of 20 to 30 degrees C, on any of the following measurement ranges: 0-0.050[1], 0-0.100[1], 0-0.200[1], 0-0.500, and 0-1.000 ppm, and with or without the optional Internal zero air supply and permeation tube oven.[2] [*Federal Register*: Vol. 63, page 41253, 08/03/98]

Environnement S. A. Model AC31M NO_2 Analyzer *Automated Reference Method:* **RFNA-0795-104**

"Environnement S. A. Model AC31M Chemiluminescent Nitrogen Oxide Analyzer," operated with a full scale range of 0 - 500 ppb, at any temperature in the range of 15°C to 35°C, with a 5-micron PTFE sample particulate filter, with the following software settings: Automatic response time ON; Minimum response time set to 60 seconds (RT ÷ 2); and with or without any of the following options:[2] Internal Permeation Oven; Connection for Silica Gel Dryer; RS232-422 interface; EV3 valve; Internal Printer.

[*Federal Register*: Vol. 60, page 38326, 07/26/95]

Environnement S. A. Model AC32M NO_2 Analyzer *Automated Reference Method:* **RFNA-0202-146**

"Environnement S. A. Model AC32M Chemiluminescent Nitrogen Oxides Analyzer," operated with a full scale range of 0 - 500 ppb, at any temperature in the range of 10°C to 35°C, with a 5-micron PTFE sample particulate filter, with response time setting 11 (automatic response time), and with or without the following option: Internal permeation oven.

[*Federal Register:* Vol. 67, page 15567, 04/02/02]

Environnement S.A. SANOA Multigas Longpath Monitoring System *Automated Reference Method:* **EQNA-0400-139**

"Environnement S.A. Model SANOA Multigas Longpath Air Quality Monitoring System," consisting of a receiver, one or more projectors, interface unit, a user-provided control unit computer running the SANOA VisionAIR software, and associated incidental equipment; configured for measuring NO_2, with the temperature control and internal calibration cell options installed, operated with a measurement range of 0 to 0.5 ppm, over an installed monitoring path length of between 27 and 500 meters, within an ambient air temperature range of -30 to +45°C, with a measurement (integrating) time of 180 seconds, and with or without external temperature and barometric pressure sensors or any of the following options: external (meteo) input connection, series 1M bus connection, OGR type projector, analog outputs. [*Federal Register*: Vol. 65, page 26603, 05/08/00]

Horiba Instruments Models APNA-360 or APNA-360-CE NO-NO_2-NO_X Monitor *Automated Reference Method:* **RFNA-0196-111**

"Horiba Instruments, Inc. Models APNA-360 or APNA-360-CE Ambient NO-NO_2-NO_X Monitor," operated with a full scale range of 0 - 0.50 or 0 - 1.0 ppm, at any temperature in the range of 10 °C to 40 °C, with a Line Setting of "MEASURE", and an Analog Output of "MOMENTARY VALUE", and with or without the following options:[2] 1) Rack Mounting Plate and Side Rails 2) RS-232 Communications Port. [*Federal Register*: Vol. 61, page 11404, 03/20/96]

Horiba Instruments Model APNA-370 NO_2 Monitor *Automated Reference Method:* **RFNA-0506-157**

"Horiba Instruments Incorporated Model APNA-370 Ambient NO_x Monitor," standard specification, operated with a full scale fixed measurement range of 0 - 0.50 ppm with the automatic range switching off, at any ambient temperature in the range of 20 °C to 30 °C, and with a 0.3 micrometer sample particulate filter installed.[2] [*Federal Register*: Vol. 71, page 25587, 05/01/06]

Meloy Model NA530R Nitrogen Oxides Analyzer *Automated Reference Method:* **RFNA-1078-031**

"Meloy Model NA530R Nitrogen Oxides Analyzer," operated on the following ranges and time constant switch positions:

Range, ppm:	0-0.1[1]	0-0.25[1]	0-0.5	0-1.0
Time Constant Setting:	4	3 or 4	2,3, or 4	2,3, or 4

Operation of the analyzer requires an external vacuum pump, either Meloy Option N-10 or an equivalent pump capable of maintaining a vacuum of 200 torr (22 inches mercury vacuum) or better at the pump connection at the specified sample and ozone-air flow rates of 1200 and 200 cm^3/min, respectively. The analyzer may be operated at temperatures between 10°C and 40°C and at line voltages between 105 and 130 volts, with or without any of the following options: N-1A Automatic Zero And Span; N-2 Vacuum Gauge; N-4 Digital Panel Meter; N-6 Remote Control For Zero And Span; N-6B Remote Zero/Span Control And Status (Pulse); N-6C Remote Zero/Span Control And Status (Timer); N-9 Manual Zero/Span; N-10 Vacuum Pump Assembly (See Alternate Requirement Above); N-11 Auto Ranging; N-14B Line Transmitter; N-18 Rack Mount Conversion; N-18A Rack Mount Conversion.

[*Federal Register:* Vol. 43, page 50733, 10/31/78 and Vol. 44, page 8327, 02/09/79]

Monitor Labs Model 8440E Nitrogen Oxides Analyzer *Automated Reference Method:* **RFNA-0677-021**

"Monitor Labs Model 8440E Nitrogen Oxides Analyzer," operated on a 0-0.5 ppm range (position 2 of range switch) with a time constant setting of 20 seconds, with or without any of the following options:

TF- Sample Particulate Filter With TFE Filter Element	DO- Status Outputs	018A- Ozone Dry Air	O18B- Ozone Dry Air - No Drierite
	R- Rack Mount	V- Zero/Span Valves	FM- Flow meters

[*Federal Register:* Vol. 42, page 37434, 07/21/77; Vol. 42, page 46575, 09/16/77; Vol. 46, page 29986, 06/04/81]

Monitor Labs/Lear Siegler Model 8840 Nitrogen Oxides Analyzer *Automated Reference Method:* **RFNA-0280-042**

"Monitor Labs or Lear Siegler Model 8840 Nitrogen Oxides Analyzer," operated on a range of either 0-0.5 or 0-1.0 ppm, with an internal time constant setting of 60 seconds, a TFE sample filter installed on the sample inlet line, with or without any of the following options:

02 Flowmeter	08A Pump Pac Assembly With 09A (115 VAC)	011A Recorder Output 1 Volt
03A Rack Ears	08B Pump Pac Assembly With 09B (100 VAC)	011B Recorder Output 100 mV
03B Slides	08C Pump Pac Assembly With 09C (220/240 VAC)	011C Recorder Output 10 mV
05A Zero/Span Valves	08D Rack Mount Panel Assembly	012A DAS Output 1 Volt
05B Valve/Relay	09A Pump 115 VAC 50/60 Hz	012B DAS Output 100 mV
06 Status	09B Pump 100 VAC 50/60 Hz	012C DAS Output 10 mV
07A Input Power Transformer 100 VAC, 50/60 Hz	09C Pump 220/240 VAC 50 Hz	013A Ozone Dry Air
07B Input Power Transformer 220/240 VAC 50 Hz		013B Ozone Dry Air - No Drierite

[*Federal Register:* Vol. 45, page 9100, 02/11/80 and Vol. 46, page 29986, 06/04/81]

Monitor Labs/Lear Siegler Model 8841 Nitrogen Oxides Analyzer *Automated Reference Method:* **RFNA-0991-083**

"Monitor Labs or Lear Siegler Model 8841 Nitrogen Oxides Analyzer," operated on the 0-0.05 ppm[1], 0-0.1 ppm[1], 0-0.2 ppm[1], 0 - 0.5 ppm, or 0-1.0 ppm range, with manufacturer-supplied vacuum pump or alternative user-supplied vacuum pump capable of providing 200 torr or better absolute vacuum while operating with the analyzer. [*Federal Register:* Vol. 56, page 47473, 9/19/91]

Opsis Model AR 500 and System 300 Open Path Ambient Air Monitoring Systems for NO_2 *Automated Equivalent Method:* **EQNA-0495-102**

"Opsis Model AR 500 System" or "System 300" Open Path (long path) Ambient Air Monitoring Systems, configured for measuring NO_2, with one detector and movable grating, operated with a measurement range of 0 to 0.5 ppm, an installed monitoring path length between 50 and 500 meters (or 50 and 1000 meters with the ER 150 option, AR 500 System only), xenon lamp type B (150 watt), fiber optic cable length between 3 and 20 meters; operating within an ambient air temperature range of -50 to +50°C, an analyzer temperature range of 20 to 30°C, a measurement (integrating) time setting between 30 and 120 seconds (0 min:30 sec. to 2 min:00 sec.), and with a complete cycle time of not more than 200 seconds (3 min, 20 sec.). Under this method designation, the Model AR 500 System or System 300 consists of: AR 500 opto-analyser; emitter EM 110 and receiver RE 110 (together identified as ER 110); optic fibre cable OF60-S; power supply PS 150; OPSIS operational software, version 7.0 or 7.1; and initial on-site installation, setup, and limited operator training.[2]

Optional components that can be used with the Model AR 500 only, in addition to or as alternative to corresponding components listed above: • AR 503 opto-analyzer configured as Model AR 500 (only the center detector active, sequential monitoring) • Emitter/receiver ER 150 (for monitoring path lengths up to 1 kilometer) • Transceiver ER 130 and Retroreflector RE 090 with 7 prisms (max. monitoring path length 150 meters) or 12 prisms (max. monitoring path length 250 meters) • Receiver RE 130 • Xenon lamp type A (higher short-wavelength UV output) • Optic fibre cable OF60-R (low-loss for short wavelengths) • Multiplexers MX 004 and MX 024 • Dataloggers DL 010 and DL 016 • Analogue and digital input/output cards AO 008, AI 016, and DI 032 • Analogue and digital isolation cards IA 008, ID 008, OA 008, and OD 008 • Window heaters HF 110 and HF 150 • Mirror heaters HM 110 and HM 150 • Auto calibration unit CU 007 • Software packages IO 80 (for the analogue and digital input/output adapters), DL10 and DL16 (for data loggers), ComVision, and STAT 500;
Recommended calibration and accuracy audit components (or equivalent) for either Model AR 500 or System 300: • Wavelength calibration lamp CA 004 • Calibration bench CB 100 • Receiver unit RE 060 (two required) • Calibration unit CA 150, with same type lamp as used in the monitoring path emitter • Power supply PS 150 for calibration unit CA 150 • Calibration cells CC 001-X, where X represents various cell lengths from 1 to 900 mm • Filter GG 400 • Special calibration cells CC 110 or CC 150 (for mounting directly on receiver) • Light meter LM 010 [*Federal Register*: Vol. 60, page 21518, 05/02/95]

Philips Model PW9762/02 $NO/NO_2/NO_x$ Analyzer *Automated Reference Method:* **RFNA-0879-040**
"Philips Model PW9762/02 $NO/NO_2/NO_x$ Analyzer," consisting of the following components: PW9762/02 Basic Analyzer; PW9729/00 Converter Cartridge; PW9731/00 Sampler or PW9731/20 Dust Filter; operated on a range of 0-0.5 ppm, with or without any of the following accessories: PW9752/00 Air Sampler Manifold; PW9732/00 Sample Line Heater; PW9011/00 Remote Control Set. [*Federal Register:* Vol. 44, page 51683, 09/04/79]

Seres Model NO_x 2000 G Nitrogen Dioxide Analyzer *Automated Reference Method:* **RFNA-0706-163**
"Seres Model NO_x 2000 G Nitrogen Dioxide Ambient Air Analyzer," operated with a full scale measurement range of 1 - 0.50 ppm, at any ambient temperature in the range of 20°C to 30 °C. [*Federal Register:* Vol. 71, page 42089, 07/25/06]

SIR S.A. Model S-5012 Nitrogen Oxides Analyzer *Automated Reference Method*: **RFNA-0804-152**
SIR S.A. Model S-5012 Chemiluminescent Nitrogen Oxides Analyzer, operated with a full scale range of 0 - 500 ppb, at any temperature in the range of 20°C to 30 °C, with the integration time set to 1 minute, with the "initial zero" disabled, and with a specified Teflon particulate filter installed in the sample inlet filter holder.[2] [*Federal Register:* Vol. 69, page 47924, 08/06/04]

Teledyne - Advanced Pollution Instrumentation, Inc. Models 200A, 200AU, 200E; *Automated Reference Method:* **RFNA-1194-099**
Teledyne Analytical Instruments Model 9110A; or Teledyne Monitor Labs sensor-e™ Model TML-41 NO_2 Analyzers
"Teledyne - Advanced Pollution Instrumentation, Inc. Models 200A, 200AU, 9110A, or 200E; Teledyne Analytical Instruments Model 9110A; or Teledyne Monitor Labs, Inc. sensor-e™ Model TML-41 Chemiluminescence Nitrogen Oxides Analyzer," operated on any full scale range between 0-0.05 ppm and 0-1.0 ppm, with a PTFE filter element installed in the internal filter assembly, with the following software settings: dynamic zero: OFF or ON; dynamic span: OFF; cal-on-NO_2: OFF; dilution factor: OFF or set to 1.0; autocal: ON or OFF; independent range: ON or OFF; autorange: ON or OFF; temperature/pressure compensation: ON; and with or without any of the following options (if available): rack mounts with or without slides, rack mount for external pump, zero/span valves, 4-20 mA analog outputs, status outputs, RS-232 output. **Models 200A, 200E[2], and TML-41 only:** operated at any temperature in the range of 5 °C to 40 °C, with either a user- or vendor-supplied vacuum pump capable of providing an absolute pressure of 10 inches mercury or less at 2 slpm, with or without optional internal zero/span (IZS) and permeation tubes for IZS, gold-plated reaction chamber, or Nafion-type sample gas conditioner, ethernet output, control input, RS-485 output. **Model 200AU only:** operated at any temperature in the range of 20 °C to 30 °C, with either a user- or vendor-supplied vacuum pump capable of providing an absolute pressure of 4 inches mercury or less at 1 slpm. [*Federal Register*: Vol. 59, page 61892,12/02/94]

Teledyne Monitor Labs/Casella/Ecotech Models ML9841, ML9841A/EC9841A/EC9841T, Teledyne Monitor Labs/Casella/Ecotech Model ML9841B/EC9841B, or Wedding & Associates Model 1030 NO_2 Analyzers ***Automated Reference Method:*** **RFNA-1292-090**
"Teledyne Monitor Labs, Casella Monitor, or Ecotech Models ML9841, ML9841A/EC9841A, or ML9841B/EC9841B, Ecotech Model 9841T, or Wedding & Associates, Inc. Model 1030 Nitrogen Oxides Analyzers," operated on any full scale range between 0-0.05 ppm[1] and 0-1.0 ppm, at any temperature in the range of 15°C to 35°C, with the service switch on the secondary panel set to the *In* position; with the following menu choices selected: Range: *0.05 ppm* to *1.0 ppm*; Over-ranging: *Enabled* or *Disabled*; Calibration: *Manual* or *Timed*; Diagnostic Mode: *Operate*; Filter Type: *Kalman*; Pres/Temp/Flow Comp: *On*; Span Comp: *Disabled*; and as follows: **Models ML9841, ML9841A/EC9841A, and EC9841T** - with a five-micron Teflon® filter element installed internally, with the 50-pin I/O board installed on the rear panel configured at any of the following output range setting: Voltage, 0.1 V, 1 V, 5 V, 10 V; Current, 0-20 mA, 2-20 mA, 4-20 mA; and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Internal Zero/Span (IZS) Assembly for; Rack Mount Assembly; Internal Floppy Disk Drive. **Models ML9841B/EC9841B and 1030** - with a vendor-supplied or equivalent user-supplied five-micron Teflon® filter and exhaust pump, and with or without any of the following

options: Valve Assembly for External Zero/Span (EZS); 50-pin I/O board; Internal Zero/Span (IZS) Assembly; Rack Mount Assembly; Charcoal exhaust scrubber; hinged, fold-down front panel. [*Federal Register:* Vol. 57, page 60198, 12/18/92]

Thermo Electron/Thermo Environmental Instruments Model 14 B/E *Automated Reference Method:* **RFNA-0179-035**
"Thermo Electron or Thermo Environmental Instruments, Inc. Model 14 B/E Chemiluminescent $NO/NO_2/NO_x$ Analyzer," operated on the 0-0.5 ppm range, with or without any of the following options:
14-001 Teflon Particulate Filter 14-003 Long-Time Signal Integrator 14-005 Sample Flowmeter
14-002 Voltage Divider Card 14-004 Indicating Temperature Controller 14-006 Air Filter
[*Federal Register:* Vol. 44, page 7805, 02/07/79 and Vol.44, page 54545, 09/20/79]

Thermo Electron/Thermo Environmental Instruments Model 14 D/E *Automated Reference Method:* **RFNA-0279-037**
"Thermo Electron or Thermo Environmental Instruments, Inc. Model 14 D/E Chemiluminescent $NO/NO_2/NO_x$ Analyzer," operated on the 0-0.5 ppm range, with or without any of the following options: 14-001 Teflon Particulate Filter; 14-002 Voltage Divider Card.
[*Federal Register:* Vol. 44, page 10429, 02/20/79]

Thermo Environmental Instruments Models 42, 42C, 42*i* $NO/NO_2/NO_x$ Analyzer *Automated Reference Method:* **RFNA-1289-074**
"Thermo Environmental Instruments Inc. Model 42, Model 42C, or Model 42*i* Chemiluminescence $NO\text{-}NO_2\text{-}NO_x$ Analyzer," operated on any measurement range between 0-50 ppb[1] and 0-1000 ppb, with any time average setting from 10 to 300 seconds, with temperature and/or pressure compensation on or off, operated at temperatures between 15 °C and 35 °C, and with or without an exhaust ozone scrubber or any of the following options: [2] Rack mounts; Internal Zero/span and sample valves with remote activation; Ozone particulate filter; Teflon particulate filter; Ozone permeation dryer; Permeation Oven; RS-232/485 interface, 4-20 mA current output, or I/O expansion board; **Model 42 only:** Pressure transducer, Sample/ozone flow meters.
[*Federal Register:* Vol. 54, page 50820, 12/11/89]

LEAD

Reference Method for Lead *Manual Reference Method:* **40 CFR Part 50, Appendix G**
Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air.
[*Federal Register:* Vol. 43, page 46258, 10/05/78]

Energy-Dispersive X-Ray Fluorescence Spectrometry (TNRCC) *Manual Equivalent Method:* **EQL-0783-058**
"Determination of Lead Concentration in Ambient Particulate Matter by Energy-Dispersive X-Ray Fluorescence Spectrometry (Texas Natural Resource Conservation Commission)" Texas Natural Resource Conservation Commission, P.O. Box 13087, Austin, TX 78711-3087. [*Federal Register:* Vol. 48, page 29742, 06/28/83]

Energy-Dispersive X-Ray Fluorescence Spectrometry (NEA, Inc.) *Manual Equivalent Method:* **EQL-0589-072**
"Determination of Lead Concentration in Ambient Particulate Matter by Energy-Dispersive X-Ray Fluorescence Spectrometry (NEA, Inc.)" Nuclear Environmental Analysis, Inc., Suite 260, 10950 SW 5th Street, Beaverton, OR 97005.
[*Federal Register:* Vol. 54, page 20193, 05/10/89]

Flame Atomic Absorption Spectrometry *Manual Equivalent Method:* **EQL-0380-043**
"Determination of Lead Concentration in Ambient Particulate Matter by Flame Atomic Absorption Spectrometry Following Ultrasonic Extraction with Heated HNO_3-HCl" *Federal Register:* Vol. 45, page 14648, 03/06/80]

Flameless Atomic Absorption Spectrometry (EPA/RTP, N.C.) *Manual Equivalent Method:* **EQL-0380-044**
"Determination of Lead Concentration in Ambient Particulate Matter by Flameless Atomic Absorption Spectrometry (EPA/RTP, N.C.)"
[*Federal Register:* Vol. 45, page 14648, 03/06/80]

Flameless (Graphite Furnace) Atomic Absorption (Houston, Texas) *Manual Equivalent Method:* **EQL-0895-107**
"Determination of Lead Concentration in Ambient Particulate Matter by Flameless (Graphite Furnace) Atomic Absorption (City of Houston, Texas)." Health and Human Services Department, Environmental Chemistry Service, 1115 S. Braeswood, Houston, TX 77030. [*Federal Register*: Vol. 60, page 39383, 08/02/95]

Flameless Atomic Absorption Spectrometry (Omaha) *Manual Equivalent Method:* **EQL-0785-059**
"Determination of Lead Concentration in Ambient Particulate Matter by Flameless Atomic Absorption Spectrometry (Omaha-Douglas County Health Department)" Omaha-Douglas County Health Department, 1819 Farnam Street, Omaha, NE 68183.
[*Federal Register:* Vol. 50, page 37909, 09/18/85]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Doe Run) *Manual Equivalent Method:* **EQL-0196-113**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Doe Run Co.)" Doe Run Company, Smelting Division, 881 Main Street Herculaneum, MO 63048
[*Federal Register:* Vol. 61, page 11404, 03/20/96]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (EPA/RTP) *Manual Equivalent Method:* **EQL-0380-045**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (EPA/RTP, N.C.)" [*Federal Register:* Vol. 45, page 14648, 03/06/80]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (IL) *Manual Equivalent Method:* **EQL-1193-094**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (State of Illinois)." State of Illinois, Environmental Protection Agency, Champaign Inorganic Laboratory, 2120 South First Street, Champaign, IL 61820 [*Federal Register:* Vol. 58, page 61902, 11/23/93]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Kansas) *Manual Equivalent Method:* **EQL-0592-085**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (State of Kansas)" State of Kansas, Department of Health and Environment, Forbes Field, Building 740, Topeka, KS 66620-0001. [*Federal Register:* Vol. 57, page 20823, 05/15/92]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Montana) *Manual Equivalent Method:* **EQL-0483-057**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (State of Montana)". State of Montana, Department of Health and Environmental Sciences, Cogswell Building, Helena, MT 59620. [*Federal Register:* Vol. 48, page 14748, 04/05/83]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (NETI) *Manual Equivalent Method:* **EQL-1188-069**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Northern Engineering and Testing, Inc.)" Northern Engineering and Testing, Inc., P.O. Box 30615, Billings, MT 59107.
[*Federal Register:* Vol. 53, page 44947, 11/07/88]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (NH) *Manual Equivalent Method:* **EQL-1290-080**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (State of New Hampshire)" State of New Hampshire, Department of Environmental Services, Laboratory Service Unit, 6 Hazen Drive (P.O. Box 95), Concord, NH 03302-0095. [*Federal Register:* Vol. 55, page 49119, 11/26/90]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (PA) *Manual Equivalent Method:* **EQL-0592-086**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Commonwealth of Pennsylvania)" Commonwealth of Pennsylvania, Department of Environmental Resources, P.O. Box 2357, Harrisburg, PA 17105-2357. [*Federal Register:* Vol. 57, page 20823, 05/15/92]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Pima, AZ) *Manual Equivalent Method:* **EQL-0995-109**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Pima County, Arizona)." Pima County, Wastewater Management Department, 201 North Stone Avenue, Tucson, Arizona 85701-1207. [*Federal Register*: Vol. 60, page 54684, 10/25/95]

Inductively Coupled Argon Plasma-Mass Spectrometry (Pima Co., AZ) *Manual Equivalent Method:* **EQL-0995-110**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Plasma-Mass Spectrometry (Pima County, Arizona)." Pima County, Wastewater Management Department, 201 North Stone Avenue, Tucson, Arizona 85701-1207.
[*Federal Register*: Vol. 60, page 54684, 10/25/95]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (RI) *Manual Equivalent Method:* **EQL-0888-068**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (State of Rhode Island)," State of Rhode Island Department of Health, Air Pollution Laboratory, 50 Orms Street, Providence, RI 02904 [*Federal Register:* Vol. 53, page 30866, 08/16/88]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Silver Valley) *Manual Equivalent Method:* **EQL-1288-070**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (Silver Valley Laboratories)," Silver Valley Laboratories, Inc., P.O. Box 929, Kellogg, ID 83837.
[*Federal Register:* Vol. 53, page 48974, 12/05/88]

Inductively Coupled Argon Plasma-Atomic Emission Spectrometry (TNRCC) *Manual Equivalent Method:* **EQL-0400-140**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry (TNRCC)," Texas Natural Resource Conservation Commission Laboratory, 5144 E. Sam Houston Parkway N., Houston, TX 77030. [*Federal Register*: Vol. 65, page 26603, 5/8/00]

Inductively Coupled Argon Plasma-Optical Emission Spectrometry (WV) *Manual Equivalent Method:* **EQL-0694-096**
"Determination of Lead Concentration in Ambient Particulate Matter by Inductively Coupled Argon Plasma-Optical Emission Spectrometry (State of West Virginia)." State of West Virginia, Department of Commerce, Labor and Environmental Resources, Division of Environmental Protection, 1558 Washington Street East, Charleston, WV 25311-2599
[*Federal Register:* Vol. 59, page 29429, 06/07/94]

Wavelength Dispersive X-Ray Fluorescence Spectrometry (CA) *Manual Equivalent Method:* **EQL-0581-052**
"Determination of Lead Concentration in Ambient Particulate Matter by Wavelength Dispersive X-Ray Fluorescence Spectrometry" California Department of Health Services, Air & Industrial Hygiene Laboratory, 2151 Berkeley Way, Berkeley, CA 94704.
[*Federal Register:* Vol. 46, page 29986, 06/04/81]

NOTES

[1] Users should be aware that designation of this analyzer for operation on ranges less than the range specified in the performance specifications for this analyzer (40 CFR 53, Subpart B) is based on meeting the same absolute performance specifications required for the specified range. Thus, designation of these lower ranges does not imply commensurably better performance than that obtained on the specified range.

[2] This analyzer is approved for use, with proper factory configuration (if applicable), on either 50 or 60 Hertz line frequency and nominal power line voltages of 115 Vac and 230 Vac, or similar voltages as specified in the operation or instruction manual associated with the method.

Sources or Contacts for Designated Reference and Equivalent Methods

ABB Process Analytics
P.O. Box 831
Lewisburg, WV 24901
(304) 647-4358

Advanced Pollution Instrumentation, Inc.
[Refer to Teledyne - Advanced Pollution Instrumentation, Inc.]

Andersen Instruments
[Refer to Thermo Fisher Scientific, Inc.]

ASARCO Incorporated
3422 South 700 West
Salt Lake City, UT 84119
(801) 262-2459

Beckman Instruments, Inc.
Process Instruments Division
2500 Harbor Blvd.
Fullerton, CA 92634
(714) 871-4848

Bendix
[Refer to ABB Process Analytics]

BGI Incorporated
58 Guinan Street
Waltham, MA 02451
(781) 891-9380
www.bgiusa.com (bgiinc@attglobal.net)

Casella Monitor Europe
Bedlay View, Tannochside Park
Uddingston, Glasgow, Scotland, G71 5PE
www.casellagroup.com

Columbia Scientific Industries
11950 Jollyville Road
Austin, TX 78759
(800) 531-5003

Combustion Engineering
[Refer to ABB Process Analytics]

Dasibi Environmental Corp.
[Formerly, 506 Paula Avenue
Glendale, CA 91201
(818) 247-7601
www.dasibi.com]

DKK-TOA Corporation
29-10, 1-Chome, Takadanobaba,
Shinjuku-ku
Tokyo 169-8648, Japan
www.toadkk.co.jp

Ecotech Pty. Ltd.
1492 Ferntree Gully Rd.
Knoxfield, Victoria, 3180, Australia
+61 1300 364 946
www.ecotech.com.au
American Ecotech L.C.
49 Barnsdale Road
East Providence, RI 02914
(401) 569-0399
www.AmericanEcotech.com

Environnement S.A
111, bd Robespierre
78300 Poissy, France
www.environnement-sa.com
Instruments also available from:
Altech/Environnement U.S.A.
2623 Kaneville Court
Geneva, IL 60134
(630) 262- 4400

Environics, Inc.
69 Industrial Park Rd. E.
Tolland, CT 06084-2805
(203) 429-0077
www.environics.com

Graseby GMW
[Refer to Thermo Fisher Scientific, Inc.]

Horiba Instruments Incorporated
17671 Armstrong Avenue
Irvine, CA 92714
(800) 446-7422
www.horiba.com

Lear Siegler
[Refer to Teledyne Monitor Labs, Inc.]

Commonwealth of Massachusetts
Department of Environmental
Quality Engineering
Tewksbury, MA 01876

Met One Instruments, Inc.
1600 Washington Blvd.
Grants Pass, OR 97526
(541) 471-7111
www.metone.com (metone@metone.com)

McMillan
[Refer to Columbia Scientific Industries]

Mine Safety Appliances
600 Penn Center Blvd.
Pittsburgh, PA 15235-5810
(412) 273-5101

Monitor Labs, Inc.
[Refer to Teledyne Monitor Labs, Inc.]

New Star Environmental, LLC
3293 Ashburton Chase NE
Roswell, GA 30075
(770) 998-2590

Opsis AB, Furulund, Sweden
Instruments also available from:
Opsis, Inc.
146-148 Sound Beach Avenue
Old Greenwich, CT 06870
(203) 698-1810
www.opsis.se

State of Oregon
Department of Environmental Quality
Air Quality Division
811 S.W. Sixth Avenue
Portland, OR 97204

PCI Ozone Corp.
One Fairfield Crescent
West Caldwell, NJ 07006
(201) 575-7052
www.pci-wedeco.com

Phillips Electronic Instruments, Inc.
85 McKee Drive
Mahwah, NJ 07430

Rupprecht & Patashnick Co., Inc.
[Refer to Thermo Fisher Scientific, Inc.]
[26 Tech Valley Drive]
[East Greenbush, NY 12061]
[(518) 452-0065]
[www.rpco.com]

Sibata Scientific Technology, Ltd.
1-25, 3-chome
Ikenohata, Taito-ku
Tokyo 110, Japan
81-3(3822)2272
TTani@email.msn.com

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360, Rue Louis de Broglie
La Duranne BP 87000
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Cedex 3 FRANCE
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www.seres-france.com

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Avenida de la Industria, 3
Tres Cantos 28760 Madrid, SPAIN
(+34) 91 803 66 02
http://www.sirsa.es

SIR USA
826 West Braddock Road
Alexandria, VA 22302-3605
(703) 837-1883

Tanabyte Engineering, Inc.
1210 West Burbank Blvd., Suite B,
Burbank, CA 91506
(818) 842-4022
www.tanabyte.com

Teledyne - Advanced Pollution Instrumentation, Inc.
9480 Carroll Park Drive
San Diego, CA 92121-5201
(858) 657-9800
www.teledyne-api.com

Teledyne Analytical Instruments
16830 Chestnut Street
City of Industry, CA 91748
(626) 934-1622

Teledyne Monitor Labs, Inc.
74 Inverness Drive East
Englewood, CO 80112-5189
(303) 792-3300
www.teledyne-ml.com

Thermo Electron Corporation
[Refer to Thermo Fisher Scientific, Inc.]
[27 Forge Parkway]
[Franklin, MA 02038]
[(508) 520-0430 / (866) 282-0430]
www.thermo.com

Thermo Environmental Instruments, Inc.
[Refer to Thermo Fisher Scientific, Inc.]
www.thermoei.com

Thermo Fisher Scientific, Inc.
81 Wyman Street
Waltham, MA 02454
(781) 622-1000 / (800) 678-5599
www.thermo.com

Tisch Environmental, Inc.
145 S. Miami Avenue
Village of Cleves, OH 45002
(513) 467-9000
www.tisch-env.com

URG Corporation
116 Merritt Mill Road
Chapel Hill, NC 27516
(919) 942-2753

U.S. EPA
National Exposure Research Laboratory
Human Exposure & Atmospheric Sciences Division
Process Modeling Research Branch (MD D205-03)
Research Triangle Park, NC 27711
(919) 541- 3737
www.epa.gov/heasd

Wedding and Associates, Inc.
[Refer to Thermo Fisher Scientific, Inc.]

U.S. EPA REFERENCE & EQUIVALENT METHODS FOR AMBIENT AIR

Method	Designation Number	Method Code
SO_2 Manual Methods		
Reference method (pararosaniline)	--	097
Technicon I (pararosaniline)	EQS-0775-001	097
Technicon II (pararosaniline)	EQS-0775-002	097
SO_2 Analyzers		
Advanced Pollution Instr. 100	EQSA-0990-077	077
Advanced Pollution Instr. 100A/100AS	EQSA-0495-100	100
Asarco 500	EQSA-0877-024	024
Beckman 953	EQSA-0678-029	029
Bendix 8303	EQSA-1078-030	030
Casella ML9850, ML9850B	EQSA-0193-092	092
Columbia Scientific Industries 5700	EQSA-0494-095	095
Dasibi 4108	EQSA-1086-061	061
DKK-TOA Corp. GFS-32	EQSA-0701-115	115
DKK-TOA Corp. GFS-112E, GFS-112E-1	EQSA-0100-133	133
DKK-TOA Corp. GFS-312E	EQSA-1107-168	168
Ecotech ML9850/EC9850, ML9850B/EC9850B	EQSA-0193-092	092
Ecotech EC9850T	EQSA-0193-092	092
Environnement S.A AF21M	EQSA-0292-084	084
Environnement S.A AF22M	EQSA-0802-149	149
Environnement S.A. SANOA	EQSA-0400-138	138
Horiba Model APSA-360/APSA-360ACE	EQSA-0197-114	114
Horiba Model APSA-370	EQSA-0506-159	159
Lear Siegler AM2020	EQSA-1280-049	049
Lear Siegler SM1000	EQSA-1275-005	005
Meloy SA185-2A	EQSA-1275-006	006
Meloy SA285E	EQSA-1078-032	032
Meloy SA700	EQSA-0580-046	046
Monitor Labs 8450	EQSA-0876-013	513
Monitor Labs or Lear Siegler 8850	EQSA-0779-039	039
Monitor Labs or Lear Siegler 8850S	EQSA-0390-075	075
Opsis AR 500, System 300 (open path)	EQSA-0495-101	101
Philips PW9700	EQSA-0876-011	511
Philips PW9755	EQSA-0676-010	010
SIR S.A. S-5001	EQSA-0507-166	166
Teledyne-Advanced Pollution Inst. 100E, 100EU	EQSA-0495-100	100
Teledyne Analytical Instruments 6400A	EQSA-0495-100	100
Teledyne Monitor Labs ML9850, ML9850B	EQSA-0193-092	092
Teledyne Monitor Labs TML-50	EQSA-0495-100	100
Thermo Electron 43	EQSA-0276-009	009
Thermo Electron 43A, 43C-TLE, 43*i*	EQSA-0486-060	060
Thermo Environmental Instruments 43B, 43C	EQSA-0486-060	060
Wedding 1040	EQSA-0193-092	092
O_3 Analyzers		
Advanced Pollution Instr. 400/400A/400E	EQOA-0992-087	087
Beckman 950A	RFOA-0577-020	020
Bendix 8002	RFOA-0176-007	007
Casella ML9810, ML9810B, ML9811, ML9812	EQOA-0193-091	091
Columbia Scientific Industries 2000	RFOA-0279-036	036
Dasibi 1003-AH, -PC, -RS	EQOA-0577-019	019
Dasibi 1008-AH, -PC, -RS	EQOA-0383-056	056
DKK-TOA Corp. GUX-113E, GUX-113E-1	EQOA-0200-134	134
DKK-TOA Corp. GUX-313E	EQOA-1107-169	169
Ecotech ML9810/EC9810, -9810B, -9811, -9812	EQOA-0193-091	091
Environics 300	EQOA-0990-078	078
Environnement S.A $O_3$41M	EQOA-0895-105	105
Environnement S.A $O_3$42M	EQOA-0206-148	148
Environnement S.A SANOA	EQOA-0400-137	137
Horiba APOA-360	EQOA-0196-112	112
Horiba APOA-370	EQOA-0506-160	160
McMillan 1100-1	RFOA-1076-014	514
McMillan 1100-2	RFOA-1076-015	515
McMillan 1100-3	RFOA-1076-016	016
Meloy OA325-2R	RFOA-1075-003	003
Meloy OA350-2R	RFOA-1075-004	004
Monitor Labs 8410E	RFOA-1176-017	017
Monitor Labs or Lear Siegler 8810	EQOA-0881-053	053
Opsis AR 500, System 300 (open path)	EQOA-0495-103	103
PCI Ozone Corp. LC-12	EQOA-0382-055	055
Philips PW9771	EQOA-0777-023	023
Seres Model OZ 2000 G	EQOA-0506-161	161
SIR S.A. S-5014	EQOA-0207-164	164
Tanabyte 722, 723, 724, 725, 726	EQOA-0407-165	165
Teledyne - Advanced Pollution Instr. 400E	EQOA-0992-087	087
Teledyne Monitor Labs ML9810/9810B, ML9811, ML9812	EQOA-0193-091	091
Teledyne Monitor Labs TML-10	EQOA-0992-087	087
Thermo Electron or Thermo Environmental Instruments 49, 49C, 49*i*	EQOA-0880-047	047
Wedding 1010	EQOA-0193-091	091
CO Analyzers		
Beckman 866	RFCA-0876-012	012
Bendix 8501-5CA	RFCA-0276-008	008
Casella ML9830, ML9830B	RFCA-0992-088	088
Dasibi 3003	RFCA-0381-051	051
Dasibi 3008	RFCA-0488-067	067
DKK-TOA Corp. GFC-311E	RFCA-0907-167	167
Ecotech ML9830/EC9830, ML9830B/EC9830B	RFCA-0992-088	088
Ecotech EC9830T	RFCA-0992-088	088
Environnement S.A CO11M	RFCA-0995-108	108
Environnement S.A CO12M	FRCA-0206-147	147
Horiba AQM-10, -11, -12	RFCA-1278-033	033
Horiba 300E/300SE	RFCA-1180-048	048
Horiba APMA-360	RFCA-0895-106	106
Horiba APMA-370	RFCA-0506-158	158
MASS - CO 1 (Massachusetts)	RFCA-1280-050	050
Monitor Labs 8310	RFCA-0979-041	041
Monitor Labs or Lear Siegler 8830	RFCA-0388-066	066
MSA 202S	RFCA-0177-018	018
Teledyne Adv. Pollution Instr. 300, 300E, 300EU	RFCA-1093-093	093
Teledyne Monitor Labs ML9830/9830B,	RFCA-0992-088	088
Teledyne Monitor Labs TML-30	RFCA-1093-093	093
Thermo Electron or Thermo Environmental Instruments 48, 48C, 48*i*	RFCA-0981-054	054
Wedding 1020	RFCA-0992-088	088
NO_2 Manual Methods		
Sodium arsenite (orifice)	EQN-1277-026	084
Sodium arsenite/Technicon II	EQN-1277-027	084
TGS-ANSA (orifice)	EQN-1277-028	098
NO_2 Analyzers		
Advanced Pollution Instr. 200	RFNA-0691-082	082
Advanced Pollution Instr. 200A/200AU	RFNA-1194-099	099
Beckman 952A	RFNA-0179-034	034
Bendix 8101-B	RFNA-0479-038	038
Bendix 8101-C	RFNA-0777-022	022
Casella ML9841, ML9841A, ML9841B	RFNA-1292-090	090
Columbia Scientific Indust.1600, 5600	RFNA-0977-025	025
Dasibi 2108	RFNA-1192-089	089
DKK-TOA Corp GLN-114E, GLN-114E-1	RFNA-0798-121	121
Ecotech ML9841A/EC9841A,ML9841B/EC9841B	RFNA-1292-090	090
Ecotech EC9841T	RFNA-1292-090	090
Environnement S.A. AC31M	RFNA-0795-104	104
Environnement S.A. AC32M	RFNA-0202-146	146
Environnement S.A. SANOA	EQNA-0400-139	139
Horiba APNA-360	RFNA-0196-111	111
Horiba APNA-370	RFNA-0506-157	157
Meloy NA530R	RFNA-1078-031	031
Monitor Labs 8440E	RFNA-0677-021	021
Monitor Labs or Lear Siegler 8840	RFNA-0280-042	042
Monitor Labs or Lear Siegler 8841	RFNA-0991-083	083
Monitor Labs ML9841	RFNA-1292-090	090
Opsis AR 500, System 300 (open path)	EQNA-0495-102	102
Philips PW9762/02	RFNA-0879-040	040
Seres Model NO_x 2000 G	RFNA-0706-163	163
SIR S.A. S-5012	RFNA-0804-152	152
Teledyne-Advanced Pollution Inst. 200E	RFNA-1194-099	099
Teledyne Analytical Instruments 9110A	RFNA-1194-099	099
Teledyne Monitor Labs ML9841, ML9841A, ML9841B	RFNA-1292-090	090
Teledyne Monitor Labs TML-41	RFNA-1194-099	099
Thermo Electron or Thermo Environmental Instruments 14B/E	RFNA-0179-035	035
Thermo Electron or Thermo Environmental Instruments 14D/E	RFNA-0279-037	037
Thermo Environmental Instr. 42, 42C, 42*i*	RFNA-1289-074	074
Wedding 1030	RFNA-1292-090	090
Pb Manual Methods		
Reference method (hi-vol/AA spect.)	--	803
Hi-vol/AA spect. (alt. extr.)	EQL-0380-043	043
Hi-vol/Energy-disp XRF (TX ACB)	EQL-0783-058	058

U.S. EPA REFERENCE & EQUIVALENT METHODS FOR AMBIENT AIR

Method	Designation Number	Method Code
Pb Manual Methods (cont'd)		
Hi-vol/Energy-disp XRF (NEA)	EQL-0589-072	072
Hi-vol/Flameless AA (EMSL/EPA)	EQL-0380-044	044
Hi-vol/Flameless AA (Houston)	EQL-0895-107	107
Hi-vol/Flameless AA (Omaha)	EQL-0785-059	059
Hi-vol/ICAP spect. (Doe Run Co.)	EQL-0196-113	113
Hi-vol/ICAP spect. (EMSL/EPA)	EQL-0380-045	045
Hi-vol/ICAP spect. (Illinois)	EQL-1193-094	094
Hi-vol/ICAP spect. (Kansas)	EQL-0592-085	085
Hi-vol/ICAP spect. (Montana)	EQL-0483-057	057
Hi-vol/ICAP spect. (NE&T)	EQL-1188-069	069
Hi-vol/ICAP spect. (New Hampshire)	EQL-1290-080	080
Hi-vol/ICAP spect. (Pennsylvania)	EQL-0592-086	086
Hi-vol/ICAP-OE spect. (Pima Co.,AZ)	EQL-0995-109	109
Hi-vol/ICAP-MS spect. (Pima Co.,AZ)	EQL-0995-110	110
Hi-vol/ICAP spect. (Rhode Island)	EQL-0888-068	068
Hi-vol/ICAP spect. (Silver Val. Labs)	EQL-1288-070	070
Hi-vol/ICAP spect. (TNRCC)	EQL-0400-140	140
Hi-vol/ICAP spect. (West Virginia)	EQL-0694-096	096
Hi-vol/WL-disp. XRF (CA A&IHL)	EQL-0581-052	052
PM_{10} Samplers		
Andersen Instruments RAAS10-100	RFPS-0699-130	130
Andersen Instruments RAAS10-200	RFPS-0699-131	131
Andersen Instruments RAAS10-300	RFPS-0699-132	132
BGI Model PQ100	RFPS-1298-124	124
BGI Model PQ200	RFPS-1298-125	125
Ecotech Model 3000 PM_{10} High Volume Sampler	RFPS-0706-162	162
New Star Environmental Model NS-6070	RFPS-0202-141	141
Oregon DEQ Medium volume sampler	RFPS-0389-071	071
Rupprecht & Patashnick Partisol 2000	RFPS-0694-098	098
R & P Partisol-FRM Model 2000	RFPS-1298-126	126
R & P Partisol-Plus Model 2025 Seq.	RFPS-1298-127	127
Sierra-Andersen/GMW 1200	RFPS-1287-063	063
Sierra-Andersen/GMW 321-B	RFPS-1287-064	064
Sierra-Andersen/GMW 321-C	RFPS-1287-065	065
Sierra-Andersen/GMW 241 Dichot.	RFPS-0789-073	073
Thermo Scientific Partisol 2000	RFPS-0694-098	098
Thermo Scientific Partisol 2000-FRM	RFPS-1298-126	126
Thermo Scientific Partisol-Plus 2025 Sequential	RFPS-1298-127	127
Tisch Environmental Model TE-6070	RFPS-0202-141	141
W&A/Thermo Electron Mod 600 HVL	RFPS-1087-062	062
PM_{10} Analyzers		
Andersen Instruments FH62I-N Beta	EQPM-0990-076	076
DKK-TOA FPM-222/222C/223/223C	EQPM-0905-156	156
DKK-TOA DUB-222(S)/223(S)	EQPM-0905-156	156
Environnement S.A. MP101M Beta	EQPM-0404-151	151
Met One BAM1020, GBAM1020, BAM1020-1, GBAM1020-1 Beta	EQPM-0798-122	122
R & P TEOM 1400, 1400a	EQPM-1090-079	079
Thermo Andersen Series FH 62 C14 Beta Monitor	EQPM-1102-150	150
Thermo Scientific TEOM 1400AB	EQPM-1090-079	079
W&A/Thermo Electron 650 Beta Gauge	EQPM-0391-081	081
$PM_{2.5}$ Samplers		
Andersen Model RAAS2.5-200 Audit	RFPS-0299-128	128
BGI PQ200/200A	RFPS-0498-116	116
BGI PQ200-VSCC or PQ200A-VSCC	EQPM-0202-142	142
BGI PQ200-VSCC or PQ200A-VSCC	RFPS-0498-116	116
Graseby Andersen RAAS2.5-100	RFPS-0598-119	119
Graseby Andersen RAAS2.5-300	RFPS-0598-120	120
R & P Partisol-FRM 2000 PM-2.5	RFPS-0498-117	117
R & P Partisol-FRM 2000 PM-2.5 [FEM]	EQPM-0202-143	143
R & P Partisol-FRM 2000 PM-2.5 [FEM]	RFPS-0498-117	117
R & P Partisol 2000 PM-2.5 Audit	RFPS-0499-129	129
R & P Partisol 2000 PM-2.5 FEM Audit	EQPM-0202-144	144
R & P Partisol 2000 PM-2.5 FEM Audit	RFPS-0499-129	129
R & P Partisol-Plus 2025 PM-2.5 Seq.	RFPS-0498-118	118
R & P Partisol-Plus 2025 PM-2.5 [FEM] Seq.	EQPM-0202-145	145
R & P Partisol-Plus 2025 PM-2.5 [FEM] Seq.	RFPS-0498-118	118
Thermo Electron RAAS2.5-100 FEM	EQPM-0804-153	153
Thermo Electron RAAS2.5-100 FEM	RFPS-0598-119	119
Thermo Electron RAAS2.5-200 FEM	EQPM-0804-154	154
Thermo Electron RAAS2.5-200 FEM	RFPS-0299-128	128
Thermo Electron RAAS2.5-300 FEM	EQPM-0804-155	155
Thermo Electron RAAS2.5-300 FEM	RFPS-0598-120	120
Thermo Environmental Model 605 CAPS	RFPS-1098-123	123
Thermo Scientific Partisol 2000-FRM	RFPS-0498-117	117
Thermo Scientific Partisol 2000-FRM	EQPM-0202-143	143
Thermo Scientific Partisol-Plus 2025 Sequential	RFPS-0498-118	118
Thermo Scientific Partisol-Plus 2025 Sequential	EQPM-0202-145	145
URG-MASS100	RFPS-0400-135	135
URG-MASS300	RFPS-0400-136	136
TSP Manual Method		
Reference method (high-volume)	--	802