

## SO<sub>2</sub> Ambient Monitoring Data Review Table

Requirement (SO <sub>2</sub> )	Frequency	Acceptable Range	Review Comments
<b>CRITICAL CRITERIA – SO<sub>2</sub></b>			
<b>Sampler/Monitor</b>	NA	<i>Meets requirements listed in FRM/FEM designation</i>	
<b>One-Point QC Check Single analyzer</b>	<i>Every 14 days</i>	<i>&lt; ± 10.1% (percent difference) or &lt; ± 1.5 ppb difference whichever is greater</i>	
<b>Zero/Span Check</b>	<i>Every 14 days</i>	<i>Zero drift &lt; ± 3.1 ppb (24-hr), &lt; ± 5.1 ppb (&gt;24hr-14 days) Span drift &lt; ± 10.1%</i>	
<b>OPERATIONAL CRITERIA – SO<sub>2</sub></b>			
<b>Shelter Temperature Range</b>	<i>Daily (hourly values)</i>	<i>20 to 30° C (hourly avg.) or per manufacturers specification if designated to a wider temp. range</i>	
<b>Shelter Temperature Control</b>	<i>Daily (hourly values)</i>	<i>&lt; 2.1° C SD over 24 hours</i>	
<b>Shelter Temperature Device Check</b>	<i>Every 182 days and 2/calendar year</i>	<i>&lt; ± 2.1° C of standard</i>	
<b>Annual Performance Evaluation Single Analyzer (SLAMS/NCORE)</b>	<i>Every site every 365 days and 1/calendar year</i>	<i>Percent difference of audit levels 3-10 &lt; ± 15.1%, Audit levels 1&amp;2 &lt; ± 1.5 ppb difference or &lt; ± 15.1%</i>	
<b>Annual Performance Evaluation Single Analyzer (PSD)</b>	<i>Quarterly</i>	<i>Percent difference of audit levels 3-10 &lt; ± 15.1%, Audit levels 1&amp;2 &lt; ± 1.5 ppb difference or &lt; ± 15.1%</i>	
<b>Federal Audit (NPAP) (SLAMS/NCORE)</b>	<i>20% of sites audited in calendar year</i>	<i>Audit levels 1&amp;2 &lt; ± 1.5 ppb difference all other levels percent difference &lt; ± 15.1%</i>	
<b>Verification / Calibration</b>	<i>Upon receipt/adjustment/repair/installation/moving Every 182 days and 2/calendar year if manual biweekly zero/span checks Every 365 days and 1/calendar year if</i>	<i>All points &lt; ± 2.1% or &lt; ± 1.5 ppb difference of best-fit straight line, whichever is greater and Slope 1 ± .05</i>	

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	<i>continuous daily zero/span checks</i>		
<b>Gaseous Standards</b>	<i>All gas cylinders</i>	<i>NIST Traceable (e.g. EPA Protocol Gas)</i>	
<b>Zero Air / Zero Air Check</b>	<i>Every 365 days and 1/calendar year</i>	<i>Concentration below LDL &lt; 0.1 ppm aromatic hydrocarbons</i>	
<b>Gas Dilution Systems</b>	<i>Every 365 days and 1/calendar year or after failure of 1-point QC check or performance evaluation</i>	<i>Accuracy &lt; ± 2.1%</i>	
<b>Detection (FEM/FRMs)</b>			
<b>Noise</b>	<i>Every 365 days and 1/calendar year</i>	<i>≤ 0.001 ppm (standard range) ≤ 0.0005 ppm (lower range)</i>	
<b>Lower detectable level</b>	<i>Every 365 days and 1/calendar year</i>	<i>≤ 0.002 ppm (standard range) ≤ 0.001 ppm (lower range)</i>	
<b>SYSTEMATIC CRITERIA – SO<sub>2</sub></b>			
<b>Standard Reporting Units</b>	<i>All data</i>	<i>ppb (final units in AQS)</i>	
<b>Rounding convention for data reported to AQS</b>	<i>All data</i>	<i>1 place after decimal with digits to right truncated</i>	
<b>Completeness (SLAMS/NCORE)</b>	<i>1-hour standard</i>	<i>Hour – 75% of hour Day – 75% of hourly values Quarter – 75% of complete days Year – 4 consecutive quarters 5-min value reported only for valid hours</i>	
<b>Completeness (PSD)</b>	<i>1-hour standard</i>	<i>Hour – 75% of hour Day – 75% of hourly values Quarter – 80% of complete days Year – 4 consecutive quarters 5-min value reported only for valid hours</i>	
<b>Sample Residence Time Verification</b>	<i>Every 365 days and 1/calendar year</i>	<i>≤ 20 seconds</i>	

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<b>Requirement (SO<sub>2</sub>)</b>	<b>Frequency</b>	<b>Acceptable Range</b>	<b>Review Comments</b>
<b>Sample Probe, Inlet, Sampling train</b>	<i>All sites</i>	<i>Borosilicate glass, (e.g. Pyrex®) or Teflon® (FEP/TFE)</i>	
<b>Pneumatic fittings</b>	<i>All tubing connections/valves</i>	<i>Teflon® (FEP/TFE), 316 stainless steel</i>	
<b>Gas Regulators</b>	<i>All gas cylinders</i>	<i>2-stage 316 stainless steel</i>	
<b>Data Acquisition Systems</b>	<i>Digital or analog recording devices</i>	<i>Collection of continuous data (minimum of 1-minute values)</i>	
<b>System Clock Verification</b>	<i>1 / month</i>	<i>≤ ± 1 minute</i>	
<b>Siting</b>	<i>Every 365 days and 1/calendar year</i>	<i>Meeting siting criteria or waiver documented, (PSD per approved QAPP)</i>	
<b>Precision (using 1-point QC Checks) (SLAMS/NCORE)</b>	<i>Calculated Annually and as appropriate for design value estimates</i>	<i>90% CL CV &lt; 10.1%</i>	
<b>Precision (using 1-point QC Checks) (PSD)</b>	<i>Calculated Quarterly</i>	<i>90% CL CV &lt; 10.1%</i>	
<b>Bias (using 1-point QC Checks) (SLAMS/NCORE)</b>	<i>Calculated Annually and as appropriate for design value estimates</i>	<i>95% CL &lt; 10.1%</i>	
<b>Bias (using 1-point QC Checks) (PSD)</b>	<i>Calculated Quarterly</i>	<i>95% CL &lt; 10.1%</i>	
<b>Technical Systems Audits (SLAMS/NCORE)</b>	<i>1 / 3 years</i>	<i>Confirmation of adherence to FRM/FEM, SOPs, and QAPP or documented waiver</i>	
<b>Technical Systems Audits (PSD)</b>	<i>Annually (within 1 month of startup and annually thereafter)</i>	<i>Confirmation of adherence to FRM/FEM, SOPs, and QAPP or documented waiver</i>	
<b>Annual PE Primary QA organization (PQAO) Evaluation</b>	<i>1 / year</i>	<i>95% of audit percent difference fall within the 1-point QC check 95% probability intervals at PQAO level of aggregation</i>	