the office:

Episode 2: Key Documents
I ♥ Quality Assurance QA Document

Key Documents

Find that EPA document?

2nd cup of coffee!
Help me!
Documentation VS. Documents
the office:

EPA Docs
What is EPA Volume II?

Guidance and information for the Ambient Air Quality Monitoring Program.
Provides guidance on:

- Network design
- Program organization
- Data Quality Objectives (DQO)
- Qualifications and training records
- Sampling Procedures
Continued:

- Describes PAMS, SLAMS, NATTS etc. and resources
- Graded approach to developing QMPs and QAPPs.
Table 12-1 Instruments and Devices Requiring Calibration and Certification

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<th>Criteria</th>
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<th>Reference</th>
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<tr>
<td>Verification/Calibration of devices in sampler/analyzer/laboratory against NIST standards</td>
<td></td>
<td>Part 50, App.L, Sec 9.3</td>
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<tr>
<td>Barometric Pressure</td>
<td>$\pm 10 \text{ mm Hg}$</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>$\pm 2^\circ \text{ C}$</td>
<td></td>
</tr>
<tr>
<td>Flow Rate</td>
<td>$\pm 2%$ of transfer standard</td>
<td>Part 50, App.L, Sec 9.2</td>
</tr>
<tr>
<td>Design Flow Rate Adjustment</td>
<td>$\pm 2%$ of design flow rate</td>
<td>Part 50, App.L, Sec 9.2.6</td>
</tr>
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<td>Clock/timer Verification</td>
<td>1 min/mo</td>
<td>Part 50, App.L, Sec 7.4</td>
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<tr>
<td>Mirobalance Calibration</td>
<td>Readability 1 $\mu$g</td>
<td>Part 50, App.L, Sec 8.1</td>
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<tr>
<td></td>
<td>Repeatability 1 $\mu$g</td>
<td></td>
</tr>
</tbody>
</table>

Verification/Calibration of devices in shelter or lab against an authoritative standard

Lab Temperature                                | $\pm 2^\circ \text{ C}$ | not described                            |
What is EPA Volume IV?

Provides information and guidance for the operation of MET monitoring equipment and systems.
Provides guidance on:

- Program requirements
- MQOs, calibration and accuracy criteria
- Determining equipment needed.
Systematic difference used as a measure of the relative accuracy of the instrument:

\[ d = \frac{1}{n} \sum (P_{x,i} - P_{y,i}) \]

where \( n \) = number of observations
\( P_{x,i} \) = \( i \)th observation of the sensor being evaluated
\( P_{y,i} \) = \( i \)th observation of the "reference" instrument

### 2.2.2 Propeller Anemometer and Vane Systems

The propeller anemometer, Figure 2.2, is a more efficient shape. The helicoid propeller is so efficient that its transfer function can be specified from theory.\(^{12}\) It creates little turbulence because the air flows mostly through it. The propeller measures wind speed when it is oriented into the wind by a vane. Its errors from imperfect alignment with some mean vector are small and are nearly proportional to the cosine of the angle of misalignment.

### 8.6.1 System Audits of Remote Sensors

System audits of a remote sensor should include a complete review of the QA/QC the station, and the station’s SOPs. The system audit will determine if the proper plans are followed during station operation. Deviations from the plans should be made as to what effect the deviation may have on data quality. To ensure consistency, a checklist should be used.

A routine check of the monitoring station should be performed to ensure that following all SOPs. In addition to specific checks recommended by the vendor, the station should be checked:

- The antenna and controller interface cables should be inspected for proper connections. If two-axis antennas are used, this will include checking for the proper orientation.
- Orientation checks should be performed on the individual antennas, and checks should be verified using solar sighting or the GPS method when necessary.
Continued:

- Met data acquisition systems (DAS)
- MET data validation and verification.
Three appendices have important forms and guidance:

- MET Systems Audit
- Sensor calibration forms
- Validation Criteria
Where can you find them?

- ARB’s QA web page
- EPA’s AMTIC web page
the office:

ARB

Docs
Quality Assurance Manual
Volume I

Quality Management Plan for Ambient Air Monitoring

July 2013
QMPs are required for all organizations conducting environmental programs for EPA.

- Each PQAO has their own.

- ARB’s Districts may write an addendum if they plan to modify sections of an approved QMP.
Where does the QMP originate?

- Title 40, CFR, Part 58

Requirements for writing QMPs are available in EPA’s QA/R-2.
The QMP describes the quality system's
- Organizational structure
- Policy & Procedures
- Responsibilities
- Lines of authority
What else does it have?

• Describes data review, validation, verification and reporting.

• Describes the required QA documents.

• It even describes these training modules!
What can you use the QMP for?

- Know major QA roles and responsibilities.
- Provides the major policies for Quality Assurance.
- District & ARB documents can reference QMP sections to reduce SOP/QAPP document size.
Where is it located?

- ARB’s Quality Assurance webpage.
- QMP is considered Volume I of the Quality Assurance Manual.

![Quality Management Documents](image-url)
Quality Assurance Project Plan for Criteria Pollutant Monitoring Program

November 2012

South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Issued by:
Office of Science & Technology Advancement
The QAPP is the project-specific “blueprint” that documents how all QA and QC are applied to environmental data operations to assure that the results are of the type and quality expected.
The QAPP integrates all technical and quality aspects of a project including:

- Planning
- Implementation
- Assessment.
QAPP Elements:

- Mission, objectives and policies
- Purpose and background etc.
-Take Aways-

• Consider referencing all SOPs rather than including the procedures in the QAPP

• The benefits
  ✓ Shorter QAPP
  ✓ Easier to update
  ✓ Easier to follow!
The QAPP applies to:

• All organizations conducting environmental programs for EPA.

• ARB’s Districts may write an addendum if they plan to modify sections of an approved QAPP.
The QAPP is valid for:

• Up to 5 years
• It can be reviewed and revised sooner.

Where is it located?

• ARB's Quality Assurance web page in the Document Repository.
AIR QUALITY SURVEILLANCE BRANCH

STANDARD OPERATING PROCEDURES
FOR
MET-ONE INSTRUMENTS
BETA ATTENUATION MASS MONITOR
(BAM-1020)

AQSBS SOP 400
First Edition

MONITORING AND LABORATORY DIVISION

June 2003

SOPs
What are they for?

SOPs help ensure tasks are:

• Performed properly

• Consistently, and

• Results are of desired quality.
SOPs are the detailed procedures for:

- Sample collection
- Instrument operation
- Preparation and analysis of samples
- Data management
Where does the requirement come from?

- 40 CFR, Part 58, Appendix A
- EPA QA Handbook II, Sec. 5
What is the process for writing, review and approval of SOPs for Districts?

1. District SOPs
2. Written and updated by District staff
3. Reviewed by District staff/management
4. If any changes write an addendum
5. Send SOPs and/or addendums to ARB for review/approval. E-copy in ARB’s Document Repository.
What is the process for writing, review and approval of SOPs for ARB?

1. ARB SOPs
2. Written or updated by staff
3. Reviewed by ARB staff and management

Once approved, SOPs are available on ARB’s Document Repository.
Guidance:

• See EPA’s Guidance for Preparing SOPs (EPA QA/G-6)

• Use ARB’s SOP Checklist
- Take Aways -

• Look at ARB's Document Repository

• Use those SOPs as a reference for writing your own

• Or write an addendum!
QUALITY MANAGEMENT DOCUMENT
ADDENDUM

(District completes Sections 1 through 6 – please type)

Section 1. ARB Document
☐ Quality Management Plan (QMP)
☐ Quality Assurance Project Plan (QAPP)
☐ Standard Operating Procedure (SOP)

Section 2. District Information
District Name:
District Address:
District Contact Name/Phone Number:
District Signature/Date:

Section 3. Document Title
(specify exact title, revision n. and date of ARB Document(s) that your District proposes to modify) Date

Section 4. Proposed Deviation(s)
(specify exact section(s), page number(s) and language in existing ARB document that your District proposes to modify and then specify proposed modification (including any spreadsheets or forms).)
To: Air Resources Board

★ Contact ARB first
PRIMARY QUALITY ASSURANCE ORGANIZATION
ROLES AND RESPONSIBILITIES FOR THE CALIFORNIA AIR RESOURCES
BOARD AND MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

Five common factors have been identified by the U.S. Environmental Protection Agency (U.S. EPA) that should be considered in defining a Primary Quality Assurance Organization (PQAO). Under the Air Resources Board (ARB) PQAO, ARB and Monitoring Organizations (MO) will strive to collaboratively address the following common factors to the extent practical. ARB has defined the roles and responsibilities of ARB and MOs within ARB’s PQAO in regard to operation of the PQAO ambient air monitoring network in order to ensure the generation of high quality, legally defensible data.

1. Operation by a common team of field operators according to a common set of procedures

ARB recognizes the unique air monitoring challenges that face California and that field operations by a common team may not be feasible. ARB and MOs acknowledge the need to strive for uniformity of procedures, thus both parties agree to work together toward employing consistent and reliable field operations.

ARB Responsibilities:

a) Maintain and disseminate a Quality Management Plan (QMP). ARB will regularly request input from MOs within ARB’s PQAO to update the QMP as needed. ARB will communicate U.S. EPA approval;
b) Review and approve alternative QMPS prepared by MOs;  
c) Maintain a PQAO contact list and working web sites;
d) Serve as a liaison between MOs within ARB’s PQAO;
e) Provide adequate training on key air monitoring operations, maintenance, quality assurance/quality control procedures;
f) Facilitate Ambient Monitoring Technical Advisory Committee meetings and information updates. Topics may include quality assurance, and data management related items; and

g) Participate in California Air Pollution Control Officer Committee meetings and other informational forums.

Monterey Bay Unified Air Pollution Control District (APCD) Responsibilities:

a) Utilize and follow ARB’s QMP. Any deviations from ARB’s QMP will be specified in an addendum and submitted to ARB for review and approval;
b) Provide a supervisory level PQAO Point-of-Contact to ARB (or designee – if non-supervisory level). The PQAO contact will be added to a list serve to allow for effective and timely dissemination of information;
Documents how ARB and Districts collaborate to fulfill air monitoring requirements for the PQAO.

★ It addresses the 5 common factors ★
Where did it originate?


Determination:

Roles and responsibilities for air monitoring activities within the PQAO needed to be formalized and documented.
How are these developed?

ARB is collaborating with air-monitoring organizations within its PQAO and EPA to finalize R&Rs.

ARB will conduct periodic assessments and make modifications as appropriate.
Where can you find it?

R&Rs are stored in ARB’s Document Repository.

[Table: Quality Management Documents]

- ARB Document Repository (List of QA documents used by monitoring organizations)
- ARB Quality Assurance Manual (QMP, QAPPs, SOPs, audit procedures)
- EPA Quality Assurance Handbook
- Document Review Checklists (QMP, QAPP and SOPs)
- Quality Assurance Reports (Precision and accuracy results, Data Quality Reports)
The QA Manual is intended for:

- Field operators
- Laboratory
- Data processing
- Program managers

What is it?

- ARB’s QA Program components — The QMP, SOPs, audits, etc.
-Take aways-

These manuals are numbered since they replaced the ARB Blue Books. Just remember to look in the Quality Assurance Manual for ARB’s QMP and various types of SOPs.

CLICK HERE —

**ARB Quality Assurance Manual (QMP, QAPPs, SOPs, audit procedures)**

The Quality Assurance Manual is comprised of six volumes that describes ARB’s Quality Assurance Program:

- **NEW** Volume I - Quality Management Plan
- Volume II - Operating Procedures for Air Quality Monitoring
- Volume III - Laboratory Standard Operating Procedures
- Volume IV - Monitoring Methods for the State Ambient Air Quality Standards
- Volume V - Audit Procedures for Air Quality Monitoring
- Volume VI - Standard Operating Procedures for Stationary Sources Emission Monitoring and Testing
Air Monitoring Web Manual

The objective of this Air Monitoring Web Manual is to provide state operating air monitoring stations and detailed instructions for acceptance, troubleshooting and calibrating specific analyzers or support equipment. The accuracy and/or validity of data obtained by any analyzer and operator proficiency. Deviations from the recommended procedures, as in the Manufacturer's Instruction Manual, may result in the rejection of data.

Therefore, the station operator must become familiar with the information contained in the data manual, as well as each Manufacturer's Instruction Manual in order to achieve a minimum level of competence in the acceptable level of data quality.

For questions or comments related to these documents, please contact Matthew Vona at (916) 323-1807 or Matt Quok at (916) 445-2555 of the Operations Support Section.

The AMTAC website is now online!

Note: To print an appendix, first download the file to your computer, then open the document and choose print.
Air Monitoring Web Manual

The objective of this Air Monitoring Web Manual is to provide standard procedures for maintaining and operating air monitoring stations and detailed instructions for acceptance testing, maintaining, troubleshooting and calibrating specific analyzers or support equipment.

The accuracy and/or validity of data obtained from any analyzer depends upon analyzer performance and operator proficiency. Deviations from the recommended procedures set forth in this manual, as well as in the Manufacturer’s Instruction Manual, may result in the collection of invalid data.

Therefore, the station operator must become familiar with the information contained in this manual as well as each Manufacturer’s Instruction Manual in order to achieve a minimum level of competence and acceptable level of data quality.

For questions or comments related to these documents, please contact Matthew Vona at (916) 323-1807 or Matt Quok at (916) 445-2555 of the Operations Support Section.

The AMTAC website is now online!

Note: To print an appendix, first download the file to your computer, then open the document and choose print.

<table>
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<th>Series</th>
<th>Instrument Type</th>
<th>SOPs*</th>
<th>Maintenance</th>
<th>Calibration</th>
<th>ATPs*</th>
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* SOP = Standard Operating Procedure, ATP = Acceptance Test Procedure, TB = Technical Bulletins
Annual Monitoring Network Report for Twenty-three Districts in California

July 2013

California Environmental Protection Agency

Air Resources Board
What is it?

- Detailed information about each monitor.
- Contains requirements in 40 CFR, Part 58.
- ARB’s report includes 23 of the 32 air districts.
Nine Districts and Bay Area, South Coast and San Diego submit their own Annual Network Plan to EPA.
★ The minimum requirements of each plan includes:

- Monitoring
- Collocation
- PM$_{2.5}$ FRM Operating schedules
- Proposed and implemented network changes
- Take aways -
Use the plan to ensure monitoring requirements are met.
QMP REVIEW CHECKLIST

QUALITY MANAGEMENT PLAN REVIEW CHECKLIST

DOCUMENT TITLE: __________________________ ORGANIZATION: __________________________

REVIEWER: __________________________

This checklist will be used to review Board (ARB) from monitoring organizes developed by the U.S. Environ CIO 2105-P 07-08-0005. EPA & information.

Note that all explanation: the QMP; he QMP.

QUALITY ASSURANCE PROJECT PLAN REVIEW CHECKLIST

This checklist will be used to review Quality Assurance Project Plans (QAPPs) that are submitted to the Cali Health Assurance Organization (PQAO). This elements found in EPA Requirements for HRA/G-5) (EPA, 2002).^2

Quality Management Section
STANDARD OPERATING PROCEDURE
Review Checklist

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<th>District:</th>
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<tr>
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<td>Document Control (on each page</td>
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Appendix H

United States Environmental Protection Agency

National Ambient Air Monitoring Technical System Audit Form
TSA Checklist

Where does it originate?

• EPA's Guidance Handbook Volume II - Appendix H.