

Station Documentation

The Top 3 Problems with Station Documentation and Solutions

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Introduction

- Importance of station documentation
- Documentation required on site
- Top 3 problems you may encounter
- Solutions
- Station logbook activity



Legality of Documentation

- All station documents are considered legal documentation
- Ensures defensible data
- Be familiar with your organization's document retention policy

Documents Required On Site

- Station and instrument logbooks
- Residence times posted
- Check sheets
- Calibrations and audits
- Certifications
- Standard Operating Procedures (SOPs)
- Manuals

Top 3 Problems

- Not writing things down
- Not reviewing documentation
- Loss of institutional knowledge

Problem I

Not Writing Things Down

Station Logbook Documentation

- Instrument maintenance
 - Calibrations, repairs, audits, periodic checks, etc.
- Station maintenance
- Events at or near station that may affect quality of data



Logbook Details

- Bound and numbered
- Legible
 - Signature and Date. Write in ink.
 - Who is performing work. Traceability.
- Cross out errors with a single line, initial & date
 - Details of past events may be entered using current date
- Avoid cryptic comments
 - These types of entries do not explain what happened
 - Be specific (who, what, when, where, why)
- Don't leave fields empty
 - Use "N/A" if no action is taken

Instrument Logbook Documentation

- Using Instrument logs is a good practice
- Follows the instrument throughout its lifetime
- Travels from one site to another



Events that Should be Recorded

- Weather
- Construction
- Emergency Response
- School Bus Idling
- Local Fires
- Will it affect data?



Station Log Entry - Example

Purpose: Station Log

Year: 2015

Date:	Time (PST)			Location: ECA
(mm-dd)	Start	End	Comments	Name
08/20	0830	1340	Routine visit, rain	John Bailey
08/21	0800	0900	Mike Jones from EPA setup equip for EPA PM2.5 audit	Jack Jones
08/23	0900	1140	Routine visit, TECO 49 repair RB 08/23/12 , TECO 55 repair	Rick Ballard
08/24	0900	1235	Routine visit, late entry; on 08-20 construction 10 yards south	John Bailey
/	/	/	of the station.	/
08/25	1200	1530	Routine visit, construction 10 yards south of station completed.	Jack Jones
08/28	0900	1730	Removed Thermo 49 O3 analyzer s/n 49-445556664, for repairs at APCD	John Bailey
/	/	/	Installed Thermo 49 O3 analyzer s/n 49-6777788886.	/
/	/	/	Removed CO gas cylinder 1500 ppmv \pm 1%, Cyl No: CA12345 expiration date 08/31/12	/
/	/	/	Installed CO gas cylinder 1450 ppmv \pm 1%, Cyl No: CA52345 expiration date 07/31/15	/
08/28	1000	1100	PM10 collect/load	Jack Jones

Instrument Check Sheets – 49i

Example

San Diego APCD
Monitoring & Technical Services
Purpose: 49i Maintenance Checks
CPN: 263351
S/N: 1132150545

Volume I
Chapter 2
Section 4
Version 1
1 January 2016

Location: CVA

Date:	Reviewed Diagnostic Data	Sample Flow Lpm		External Flow Meter	Cal Factor BKG	Replaced Filter	Name
		Display	Flow				
MM/DD/YY	✓	Cell A	Cell B			✓	

*Record any discrepancies found onto the logbook comments.

Page 1 of 5

Instrument Check Sheets – 42i

Example

San Diego APCD
 Monitoring & Technical Services
 Purpose: 42i Maintenance Checks
 CPN: 264427
 S/N: 1416761967

Volume I
 Chapter 2
 Section 1
 Version 1
 1 January 2016

Location: DTN

Date: MM/DD/YY	Reviewed Diagnostic Data	Sample Flow Lpm		Cal Factor BKG		Replaced			Name
		Display Flow m - 1	External Flow Meter	NO	NOX	Filter	Charcoal	O3 Cleanser	

*See Logbook comments section for any discrepancies found.

Site Inspection Checklist

Review Logs

Manifold Checks

Residence Times

SITE INFORMATION

Station:
Station Operator:
Date:
Site Inspection

Section 3.2
Monitoring & Technical Services
Revision 0
January 31, 2015
Page 1 of 2

Inspected by:

LOGS:	Yes	No	Comments
Written in ink			
Name or Initials			
Dated			
Logs missing			
Check sheets missing			
Station binder			
Equip manuals:	Yes	No	Comments
Manual for each instrument			
Manifold:	Yes	No	Comments
Clean			
Rain cover			
Blower working			
Unused ports capped			
Ports pointing up on horizontal sections			
Residence time:	Yes	No	Comments
On hand			
Up to date			
Sample lines:	Yes	No	Comments
Clean			
Rain cover			



Site Inspection Checklist (Cont.)

AC Unit

Shelter Temp

MARS blower:	Yes	No	Comments
Operational			
Air conditioner:	Yes	No	Comments
Filter clean			
Date of filter change recorded			
Cal info:	Yes	No	Comments
Expected spans current			
Equip cal sheets in equip log books			
Calibrations up to date			
Cal gas expiration date (Level I cal)			
QA manual:	Yes	No	Comments
On hand			
Up to date			
Station Data:	Yes	No	Comments
Data review current			

Site Inspection Checklist (Cont.)

Sampling
Obstructions



Training/Tools :	Yes	No	Comments
Tools on hand			
Spare parts on hand			
Discrepancies:	Yes	No	Comments
Documented			
Safety:			
Electrical			
Structural			
1 st aid kit			
Fire extinguisher			
Tower winch condition			
Tower cable condition			
Topside equip secured			
Grounds:			
Appearance			
Sampling obstructions			
Comments:			

Chain of Custody (COC) Forms

- COCs include more detail on samples and must be reviewed
- Traceability and accountability as samples are transferred from station operator to lab
- Provides additional information to local environment of sample run
- COCs with common flags helps with data review

Problem II

Not Reviewing Documentation

Logbook Review

- Incorporate multiple levels of logbook review
- Should be reviewed when reviewing data
- Site operators are first line of data verification



Station Operator Data Review

- Distinguish measurements from measurement errors or interferences
- Review minute data from previous day, datalogger info, nightly QC checks, diagnostics, missing data
- Compare unusual data with logbook entries
- Document anything out of the ordinary

Data Review (Cont.)

- Level II – QA team. Review Level I data and ensure data meet QA/QC.
- Level III – QA Manager. Review Level I and II. Approve data for AQS submittal.



Legality and Defensible Data

- Can I defend keeping the data valid?
- Can I defend nullifying the invalid data?
- Can I defend qualifying the data?
- Reviewing logbooks improves the quality of data

Corrective Action Notification (CAN)

- Documents issues that may impact data
- Air Quality Instrument Action (AQIA) Request – Site operators will fill out when a repair, calibration, certification on an analyzer or sampler is required
- Notifies (email) QA team lead and supervisor of CAN request

Electronic Logbooks

- Some agencies are transitioning to e-logbooks
- Accessible to everybody
- Entries cannot be overwritten
- Traceable to operator
- Email to supervisor for approval

Problem III

Loss of Institutional Knowledge

Importance of SOPs

- Helps prevent loss of institutional knowledge
- Avoid generic SOPs. Include photos. Details.
- Provides consistency throughout organization
- Reduce Errors
- Update SOPs regularly (~3 years)



SOPs for Site Operators

- Daily Routine Procedures
 - Check data before visiting site
 - Nightly QC checks, equipment diagnostics, met data
 - Station internal temp
- Procedures for analyzers
 - Weekly, biweekly, monthly, etc.
- Site Inspections

Training Records

- Ensures employees are properly trained to repair equipment
- Helps defend the legality of data
- On the job training
- Many vendors offer training



Conclusion

- “Write it down!”
- Station logbooks help ensure credible and defensible data
- Reviewing logbooks with proper documentation will help qualify data
- SOPs help minimize loss of institutional knowledge and ensure consistency

Thank You!

You may contact me by email if you
have any questions

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Station Logbook Activity

- You operate a station called Elk Field
- Site visits are done every Tuesday and Friday
- O₃ and CO analyzers run a QC check daily
- FRM runs on a 1 in 6 schedule
- A small wildfire started on February 2, 2019, 15 miles upwind of the station
- Repairs are made following District SOPs and owners manuals

Date:	Time (PST)		Location: Elk Field	
(mm-dd)	Start	End	Comments	
			Name	
1/15	9:00	15:00	Routine visit, QC checks on 49i and 48i. Diagnostics check	David Medina
			Sample run day. Pick up and load filters. High Winds from east.	
1/18	8:35	15:00	Rain, QC checks on 49i and 48i. Collect and load PM 2.5 filters	David Medina
			Cut vegetation around site.	
1/22	9:00	14:35	QC checks on 49i and 48i, Collect and load PM 2.5 filters	David Medina
			Perform monthly flow/leak checks on FRM	
1/25	9:00	15:30	Routine visit, QC checks, diagnostics check on 49i and 48i. Collect and load	David Medina
			PM 2.5 filters.	
01/29	9:00	17:30	Routine visit, QC checks, diagnostic check on 49i and 48i.	David Medina
			Collect and load PM 2.5 filters	
02/05	9:00	17:30	Late Entry: 2/2/19 Fire 15 miles upwind of site (elevated numbers)	David Medina
			Removed Thermo 49 O3 analyzer s/n: 49-43457 for repairs following SOP,	
			manufacture training, cal check prior to repair/replacement	
			Installed Thermo 49 O3 analyzer s/n: 49-44112, perform calibration and	
			linearity check	
			PM 2.5 sample run day. Collected and loaded PM 2.5 filters	
2/08	9:15	16:00	Routine visit, QC checks on 49i and 48i. Check diagnostics.	David Medina
			Run day for FRM, collect and load filters. Request more filters.	