# **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?

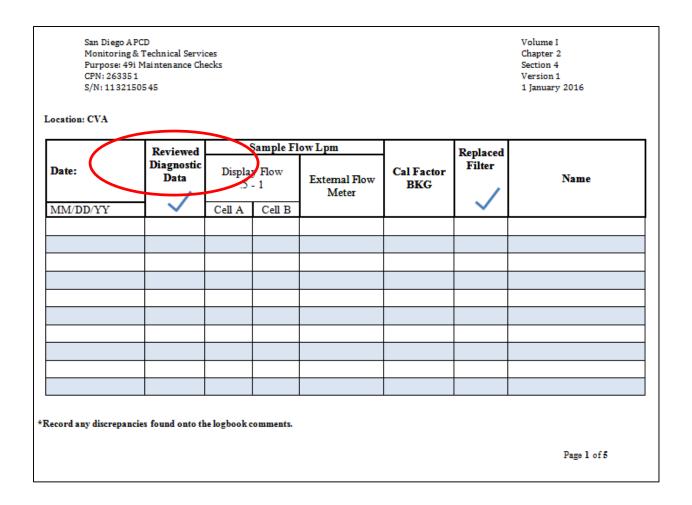




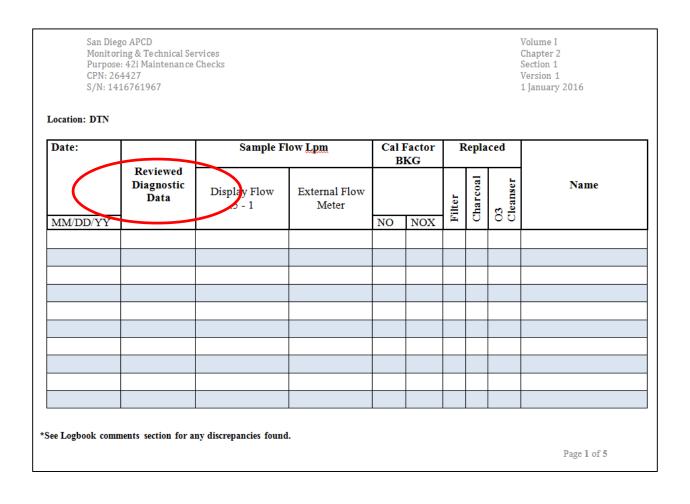
#### Station Log Entry - Example

Station L	og		Year: 2015	
Time (PST)			Location: ECA	
Start	End	Comments	Name	
0830	1340	Routine visit, rain	John Bailey	
0800	0900	Mike Jones from EPA setup equip for EPA PM2.5 audit	Jack Jones	
0900	1140	Routine visit, <del>TECO 49 repair</del> RB 08/23/12 , TECO 55 repair	Rick Ballard	
0900	1235	Routine visit, late entry; on 08-20 construction 10 yards south	John Bailey	
		of the station.		
1200	1530	Routine visit, construction 10 yards south of station completed.	Jack Jones	
0900	1730	Removed Thermo 49 O3 analyzer s/n 49-4455566664, for repairs at APCD	John Bailey	
		Installed Thermo 49 O3 analyzer s/n 49-6777788886.		
		Removed CO gas cylinder 1500 ppmv ± 1%, Cyl No: CA12345 expiration date 08/31/12		
		Installed CO gas cylinder 1450 ppmv ± 1%, Cyl No: CA52345 expiration date 07/31/15		
1000	1100	PM10 collect/load	Jack Jones	
	Time      Start      0830      0800      0900      0900      1200      0900	Start    End      0830    1340      0800    0900      0900    1140      0900    1235	Time (PST)StartEnd08301340Routine visit, rain08000900Mike Jones from EPA setup equip for EPA PM2.5 audit09001140Routine visit, TECO 49 repairRB 08/23/12, TECO 55 repair09001235Routine visit, late entry; on 08-20 construction 10 yards south	

#### Instrument Check Sheets – 49i Example



#### Instrument Check Sheets – 42i Example



#### Site Inspection Checklist

#### **Review Logs**

#### **Manifold Checks**

#### **Residence Times**

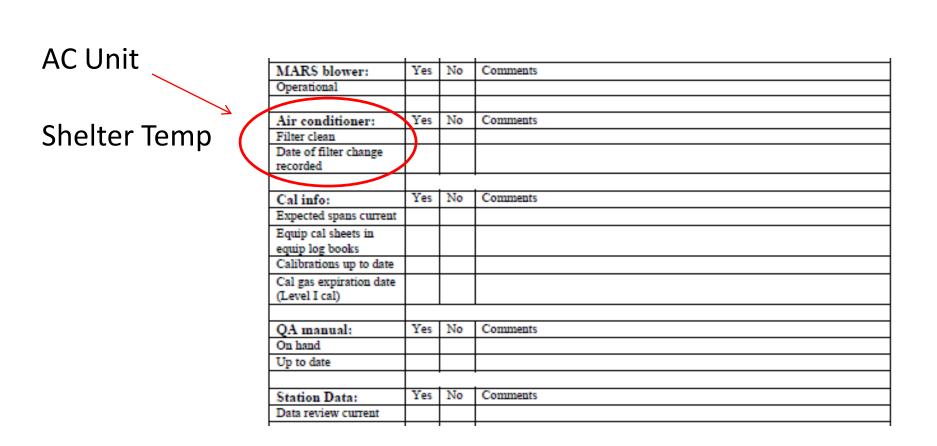
SITE INFORMATION
Station:
Station Operator:
Date:
Site Inspection

Inspected by:

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

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.)



# 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 <sup>st</sup> 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
- $O_3$  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.	

32