

Designing a Network Assessment for an Ambient Air Monitoring Program

Agency Name _____ Date Prepared _____ By _____

This document is intended to help facilitate compiling an assessment of an agency's air quality surveillance system by State and where delegated, local air monitoring programs. The requirement to submit an assessment of the air quality surveillance system is provided for in §58.10, (d) which states:

“The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and where new technologies are appropriate for incorporation in the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For PM_{2.5}, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan to the Regional Administrator. The first assessment is due July 1, 2010.”

Use of this document is **not** required, but should be of benefit to agencies and readers of the assessments so that there is a level of consistency in how assessments are prepared. Monitoring agencies that have already started developing their network assessment that may include other important analysis and/or questions not provided for in this document or the tools EPA-OAQPS have developed are encouraged to include that information so it can be shared with EPA and other readers of the network assessment. Monitoring agencies area also encouraged to work with their EPA Regional Offices on coordinating information from other monitoring programs within their Region as well as monitoring programs in other EPA Regions.

The assessment should provide a description of the networks and the relative value of each monitor and station with consideration of the data users. Annual monitoring network plans are to provide for actual proposed changes to the networks that are consistent with the findings of the five year assessment.

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This document is organized into several sections as described below:

- A. GENERAL Q/A's ON THIS NETWORK ASSESSMENT
- B. SUMMARY OF STEPS TO PRODUCE A NETWORK ASSESSMENT
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ATTACHMENT A - NAAQS SUMMARY

ATTACHMENT B - MONITORING STRATEGIES FOR EXISTING AND POSSIBLY REVISED NAAQS MONITORING NETWORKS

ATTACHMENT C – MONITOR AND STATION NETWORK SUMMARY

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ATTACHMENT D – INDEX OF HEALTH STUDIES AND ASSOCIATED AMBIENT AIR MONITORING DATA (Will be provided separately)

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A. GENERAL Q/A's ON THIS NETWORK ASSESSMENT

1. How comprehensive does our Network Assessment need to be?

Each network assessment should cover the NAAQS, Air Toxics and meteorological monitoring networks and associated technology for which the monitoring agency has responsibility. However, emphasis in the assessment should be placed on those NAAQS' and HAP's which have the highest risk issues in the network of concern. In most cases this will focus on PM (both PM_{2.5} and for some areas PM₁₀) as well as ozone.

2. How long does my Network Assessment have to be?

There is no specific length which is required or advised. However, we do recommend following a style where information is concisely presented so that readers can quickly find and review recommendations. For detailed tables and maps that present the same information across many stations or metropolitan areas, we recommend writing the network wide information in the assessment with detailed information by site or metro area in an appendix. We do advise use of an "Executive Summary" where your agency can quickly summarize the priorities of your network and how this assessment has informed that process.

3. Does the five-year Network Assessment have to be posted for public comment?

There is not a requirement to solicit public comment on a Network Assessment; however, monitoring agencies are encouraged to reach out to data users as well as post their network assessment on their web site.

4. With so many NAAQS pollutants in various stages of review, how should we handle value judgments on pollutant networks when the NAAQS may change?

Since each of the NAAQS is planned to stay on a five year review cycle where pollutants are in various stages of review, there will likely never be an optimal time to do an assessment. However, assessments need to be performed even while the NAAQS are changing. For purposes of this assessment we recommend monitoring agencies consider both final and proposed NAAQS changes when reviewing your networks. However, agencies should not propose any shifts in monitoring resources where a final decision on the NAAQS and associated monitoring has not taken place. Where NAAQS' are finalized, agencies can and should identify potential network changes in the Annual Monitoring Network Plan. Attachment A presents the most recently available timeline for each NAAQS review cycle. Given the timeline presented, we recommend both NO₂ and SO₂ be incorporated in the assessment according to the revised and proposed NAAQS' respectively.

5. Does our assessment need to specifically identify which stations are candidates for removal and addition?

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While not specified by regulation, we highly recommend your agency prioritize the monitoring stations and pollutants in your network, including estimating start-up and end dates, where applicable, for stations and monitors. Attachment C provides a template in the form of a table for qualitatively addressing this question. The table allows inclusion of important information such as monitor objective and recommendations by monitor to inform network planning and data users

6. Can our agency work with other monitoring agencies or a multi-state organization to produce a network assessment that is multi-Agency or multi-State in nature?

Yes, agencies may work collaboratively with other agencies, through multi-state organizations, or through contractors to meet the requirements of the planned five-year assessments. Where applicable, monitoring agencies will have to work with neighboring States to handle transport areas and CBSA's that cross State lines,

7. How does the five-year Network Assessment relate to the Annual Monitoring Network Plan?

The network assessment is intended to provide a comprehensive review of your agency's monitoring network as described earlier. The annual monitoring network plan is intended to be the yearly update of the planned changes to your network in consideration of the latest assessment your agency has performed. For example, the five year assessment might provide a recommendation that PM₁₀ stations are of relatively lower value in your agencies network, while the annual monitoring network plan would recommend which stations are to be shut down in which year.

8. Can the Network Assessment be in the same document as the Annual Monitoring Network Plan or do they need to be separate documents?

Yes, these documents can be combined into one document so long as all the requirements of both documents are met. This document would be subject to the public comment period.

9. What should we do if we identify new monitoring needs such as previously unmonitored areas that might have high local exposures, but are unsure if we will ever have the resources to support new activities?

We highly recommend that the Network Assessments take an approach of valuing the relative priority of new measurements and stations without immediately factoring in how the agency is going to secure the resources to implement new monitoring. For example, if there are inadequacies in the network, they should be identified and discussed (e.g., more PM_{2.5} instruments are needed but can not be funded, profilers are needed to develop a more thorough understanding of boundary layer conditions and funding sources are being investigated). We are not

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saying you should say you need a new site in every jurisdiction not previously monitored; however, if there are locations in your network that may lead to a change in where the design value location of a pollutant is measured they should be identified. Choices for how to inform exploring these locations further does not immediately mean a new SLAMS has to be set up. Options might include setting up a special purpose monitor, a mobile monitor, or local scale modeling. Agencies are encouraged to work with their Regional Offices on prioritizing new monitoring needs relative to existing monitoring. When prioritizing monitoring needs, agencies should be prepared to also identify lower value monitoring that may have served its purpose and be discontinued so that equipment and staff time can be applied to new monitoring needs as applicable.

10. Can our agency explore costs in detail to inform how the assessment might affect our resource needs?

Yes, while the network assessment is primarily about looking ahead and optimizing monitoring networks and equipment to meet the most important data uses, agencies should also be thinking about how changing network priorities will affect resource needs. Agencies are not required to explain or share costs in the assessment; however, for some agencies it may be helpful to provide information to inform readers, including interested third party data users and EPA on the impacts of continuing to support, add new, or discontinue monitoring.

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B. SUMMARY OF STEPS TO PRODUCE A NETWORK ASSESSMENT

The following steps summarize the recommended activities to assemble and produce your agency's network assessment. The execution of activities may be run in parallel or differently than presented here; however, all of these steps should be accounted for to successfully produce a network assessment.

1. **Identify internal team and leader who will produce the network assessment.** An internal assessment team should have strong writing and technical skills in air quality characterization necessary to assemble a network assessment.
 - a. We recommend the team include, at a minimum, contacts from within the monitoring program, air quality forecasting, assessment and/or SIP development, and outreach or communications. Since each air quality management program is organized differently and many organizations have staff who wear multiple hats, the actual members will likely vary significantly from one assessment team to another; however, the skills and responsibilities should be similar.
 - b. **We highly recommend that the team have a leader who is ultimately responsible for producing the assessment on a time-line necessary to meet the July 1, 2010 requirement for submission to each applicable EPA Regional Office.**
 - c. Have an internal kick-off meeting to go over the goals of the assessment, how the work is to be done, and if your agency has any additional tasks or questions that are to be addressed in the assessment.
2. **Gather network, air quality, emissions, population, and other appropriate information for use in the network assessment.** This should include use of the tools EPA has made available and other information available for assembling the network assessment. A list of these tools and where to find information is available in section C of this document. We recommend organizing this information in both:
 - a. Hard copy such as in binders and/or
 - b. Electronically on a shared drive within your organization or similar so that all team members have access.
3. **Address questions on the measurements and use of data identified in this document.** By answering the questions presented later in this document you should be in good shape to begin assembling your assessment
4. **Seek input from internal and external data users.** We recommend you:
 - a. Identify a list of internal and external data users who utilize your data.
 - b. Summarize a list of questions on their use of data and preferences for stations
 - c. Carry out and document interviews.
5. **Draft Outline of Network Assessment.** We recommend you:
 - a. Prioritize the pollutants of concern for your network
 - b. Set up an outline to support the pollutants of concern and supporting monitoring

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- c. Identify themes around which your assessment will be produced.
 - i. For example: PM_{2.5} and ozone continue to be highest pollutants of concern.
 1. Need to add upwind regional scale site to evaluate local versus regional contribution
 2. Could live with less urban/suburban sites that have never been design value sites in any of the last 10 years
 3. Community group has raised concerns about a neighborhood – analysis supports that neighborhood may have similar concentrations compared to existing design value site 8 miles away. Area identified as high value location to explore with SPM.
 4. Need to address new monitoring requirements for NO₂.
 - d. Identify the assessment information that will support the themes.
 - e. Ensure internal review within team
6. **Assemble first draft of network assessment.** Using the information you have gathered organize your network assessment in the most useful way. Options for organizing the assessment could include:
- a. Organized by metropolitan area.
 - b. Organized by pollutant or categories of pollutants and meteorology
7. **Present initial findings to internal decision makers and seek their input on recommendations.** In some larger organizations there may need to be a series of meetings prior to presenting the initial assessment to the senior leader. With the initial assessment drafted, present a summary of the initial findings that address the questions from the regulation and any other important questions. Questions from the regulation include:
- a. If the network meets the monitoring objectives defined in Appendix D to Part 58
 - b. Whether new sites are needed
 - c. Whether existing sites are no longer needed and can be terminated
 - d. Where new technologies are appropriate for incorporation in the ambient air monitoring network.
 - e. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma)
 - f. For any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies.
 - g. For PM_{2.5}, the assessment also must identify needed changes to population-oriented sites.
8. **Update network assessment.**
- a. Include senior decision maker input.
 - b. Finalize first draft for external review.

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9. **Present initial findings to key external data users.** For any major data users that work closely with the monitoring agency we recommend a call or meeting to go over the network assessment and its recommendations. Often these groups will be able to offer insights on points of emphasis and priorities for the network assessment. Groups could include:
 - a. EPA Regional Office
 - b. Regional Planning Organizations
 - c. Other Monitoring programs – especially immediately upwind and downwind of your agency’s network.
 - d. Other local data users that work closely with the monitoring agency.

10. **Post Network Assessment if associated with this years Annual Monitoring Network Plan.** Where the Network Assessment informs changes in this years (due July 1, 2010) annual monitoring network plan, the annual monitoring network plan is to be posted for public comment at least 30 days prior to submission to EPA. For convenience, we recommend posting the network assessment at the same time as the annual monitoring network plan so that readers can review both documents. Note: a public comment period is not specifically required for the Network Assessment.

11. **Finalize Network Assessment**
 - a. Update assessment to include any additional input
 - b. Seek approval of senior manager for any significant changes not already approved
 - c. Submit Final Assessment to EPA Regional Office by July 1, 2010.

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C. INFORMATION TO GATHER

The next step in producing an assessment of agency's air quality surveillance system is to gather the necessary information. This section outlines the key information to gather for the assessment. The references provided for this information are largely based on publically available information; however, agencies are encouraged to utilize their own data systems and inventories for inclusion in the assessment, especially where the graphical outputs provide a superior illustration of the information to be communicated. Also, there may be other systems that provide useful data for use in the network assessment not identified below. Please feel free to include these data, where useful. In compiling an assessment, agency's are to reference the source of the information so that readers can explore the data for themselves.

Information to Gather	Relevant Time Period to Cover	Relevant Geopolitical Coverage			Web site location (in some cases data may be on multiple sites)
		Station	CBSA	State or Full Network	
Design Values	2006 to 2008	x	x	x	http://www.epa.gov/airtrends/values.html
Pollutant Trends	1990 to 2008	x	x	x	http://www.epa.gov/airtrends/
Air Quality Index	1990 to 2008		x		http://www.epa.gov/airtrends/aqi_info.html http://www.epa.gov/cgi-bin/htmSQL/mxplorer/trend_aqi.hsql
Network Maps	Active	x	x	x	http://www.epa.gov/airexplorer/monitor_kml.htm
Information Available in Network Assessment Tools - Population Animation - Correlation Matrix Analyses Tool - Removal Bias Analyses/Tool - Area Served Analyses/Tool - New Sites Tool	2005 to 2008 (2 three-year periods)	x	x	x	http://www.epa.gov/ttn/amtic/netassess

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Information to Gather	Relevant Time Period to Cover	Relevant Geopolitical Coverage			Web site location (in some cases data may be on multiple sites)
		Station	CBSA	State or Full Network	
Speciation Data			x		http://www.epa.gov/airexplorer/
Non-Attainment Areas	Active			x	http://www.epa.gov/air/data/index.html
Population	Several Options Available		x	x	http://factfinder.census.gov (Note: there are many options for tables and mapping. Maps with population density may be most useful for inclusion.)
Meteorological Data	2006 to 2008	x	x	x	National Weather Service Local or Regional Office - http://www.nws.noaa.gov/ National Climatic Data Center - http://www.ncdc.noaa.gov/oa/ncdc.html Monitoring agencies data - Most Important Figures are: <ul style="list-style-type: none"> • Pollution Roses • Wind Roses
Emission Inventories	Last several Years		x	x	http://www.epa.gov/air/data/
Traffic Counts					State Transportation Department or Office

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Additional Helpful Web Sites	Purpose	Publicly Available	Web Address
Air Pollution Data Sources	Provides an indexed list of web sites on ambient and source data	Y	http://www.epa.gov/air/airpolldata.html
AIRNOWTech	Access to near real-time data across the country	N ¹	http://www.airnowtech.org/
AQS – Web Application	Long-Term repository of Ambient Air Data	N ²	http://www.epa.gov/ttn/airs/airsaqs/aqsweb/aqswebwarning.htm
AQS – Detailed Data	Provides large files available for download without having to have access to AQS	Y	http://www.epa.gov/ttn/airs/airsaqs/detaildata/downloaddaqdata.htm
VIEWS	Provides online access to data and reports used to support Visibility in Class 1 Areas	Y	http://views.cira.colostate.edu/web/
Datafed	Integration of large number of air quality data sets	Y	http://datafed.net
CASTNET	Supports assessment of trends in acidic deposition measurements	Y	http://www.epa.gov/castnet/
NCore Assessment Web Site	Provide assessments of planned NCore Station locations	Y	http://ncore.sonomatechdata.com/#map

¹ Access to AIRNOWTech can be granted to staff for any participating monitoring agency.

² Access to AQS is available within each monitoring agency. Additional AQS data users for each monitoring programs can be approved. See the web site for link to “User Registration”.

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D. AIR QUALITY SUMMARY

This table is intended to briefly summarize the air pollution issues of concern for the monitoring agency. Near the beginning of the assessment a written summary with a figure or table, if appropriate, should briefly describe the major NAAQS and/or risks issues that the monitoring program has responsibility for. This template should to be applied to each of the major CBSA's in the network.

	Pollutant	Status of NAAQS and major Risk Issues in Agencies Network	Extent of NAAQS Violations (list cities violating NAAQS)	Days above 100 on the AQI³	Contribution to downwind Violations?⁴
1	Ozone				
2	CO				
3	SO ₂				
4	NO ₂				
5	PM _{2.5}				
6	PM ₁₀				
7	Pb			NA	

³ An estimate of the average number of days above the 100 level for the last three years would be most useful since year to year changes in air quality can be variable.

⁴ If a CBSA in the next downwind State violates the NAAQS, identify that information here.

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E. POPULATION SUMMARY

We recommend use of population information from the latest available census estimates. Ensure the network assessment covers the following population summary information:

1. Provide a breakdown of overall and CBSA populations in the network.
 - a. Overall population in the network
 - b. Large CBSA's – e.g., over 1,000,000
 - c. Medium CBSA's – e.g., 350,000 to 1,000,000
 - d. Small CBSA's – 50,000 to 350,000
 - e. Micropolitan areas – 10,000 to 50,000
 - f. Populations outside of CBSA's
2. How has population changed over the last several years across the network?
 - a. Identify CBSA populations with changes over time (e.g., 2000 census to latest estimate)
 - b. Ensure assessment identifies population shifts within a metro area, if they exist (e.g., less population in urban core with new population coverage in outlying counties).
3. Does the assessment identify sensitive sub-populations and their exposures?
 - a. Children
 - b. Environmental Justice areas
4. Based on current growth and development and any other information (e.g., rezoning and planned developments) which areas of the agencies network are most likely to see an increase in population over the next several years?

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F. METEOROLOGICAL SUMMARY

Ensure that the Assessment addresses the following meteorological information:

1. Are wind roses provided for each major CBSA?
 - a. By season
 - b. Annual summary
 - c. Are pollution roses provided for pollutants near or above the NAAQS?
2. Need to identify if wind vectors are similar or different for various episodes. This is critical information in determining the area of maximum concentration for a pollutant exposure. For some CBSA's more than one site may be necessary to characterize the area of maximum concentration.
3. Additional Questions
 - a. How does temperature and available sunlight vary throughout the year?
 - b. Does the agency have access to important upper air information either through its own program or other sources to support forecasting and SIP decision making?
 - c. Is other important meteorological data (e.g., stagnation data) readily accessible to agency forecasters? May be helpful to list the sources of this kind of information in the assessment.

G. EMISSIONS INVENTORY SUMMARY

Ensure that the Assessment addresses the following emissions information:

1. Statewide and local level emission source trends, characteristics, and inventory
 - a. Include any important upwind emissions information
2. Statewide plans to modify, add, or remove emission sources

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H. MONITORING NETWORK/DATA GENERAL QUESTIONS

Ensure that the Assessment covers each of the following:

As previously mentioned the organization of how to cover these topics may vary from one monitoring agency to the next.

1. Who are the primary data users? *Include all major users*
 - a. Monitoring Program
 - b. Compare to NAAQS or agencies use of long-term trends
 - c. Required by SIP or Maintenance plan – is there a sunset date after which monitoring can be retired if air becomes sufficiently clean?
 - d. State standard or program
 - e. Other internal data use?
 - f. Public – (i.e., AQI reports)
 - g. EPA Federal (Agency would not run monitor expect that have been asked by EPA to do so)
 - h. Third Party science data users or other?

2. What is the most important monitoring objective for this site/network? *e.g., a site may have occasional high concentrations that are important for AQI but it does not violate the NAAQS.*
 - a. NAAQS – violates the NAAQS or a site used in emission control strategy development
 - b. AQI – number of days above 100 level
 - c. Used in health or atmospheric study – which one and when does the study conclude?
 - d. Long-term trends
 - e. Model validation
 - f. Other - List

3. What is the domain of responsibility for the monitoring agency and how does it relate to upwind and downwind impacts?
 - a. What is the geopolitical area of responsibility? A State, a county, a multi-county area
 - b. What upwind areas typically transport pollution into our networks?
 - c. What downwind areas are impacted by transport from our networks?

4. Beyond Federal requirements are there any specific State or local priorities that the Monitoring Networks serve. Some possible examples (not exhaustive) – identify all that are relevant:
 - a. **List State Air Quality Standards**, even if redundant with Federal Standards

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- b. Are there any other Air Quality Standards or goals not already listed?
 - c. Notification of “burn-bans” or other action day programs.
5. Are there known health or atmospheric science users of the ambient air monitoring data? *See attachment D on Index of Health Studies and Associated Ambient Air Monitoring Data*
- a. Clearly identify any on-going studies that could potentially be impacted by changes to the network.
 - b. Identify any already completed studies and cite, if available any published papers from these data

I. POLLUTANT SPECIFIC SUMMARY – ALL POLLUTANTS

These first series of questions apply individually to all of the NAAQS

Ensure that the Assessment covers each of the following:

1. What is the priority of this pollutant relative to others in the network? Be clear about the pollutants relative importance:
 - a. Pollutant violates the NAAQS
 - b. Pollutant is near the NAAQS
 - c. Pollutant is well below the NAAQS, but is used in assessing ratio with other NAAQS that do violate
 - d. Pollutant is well below the NAAQS and some of the existing sites should be considered low-value
2. Is there a table or similar that provides the design value for each monitoring site?
3. Is there a table or graphic that describes/illustrates the uniqueness or correlation of the sites in the network?
4. Does the site still meet the network design requirements? (i.e., maximum concentration site)
5. If any atmospheric dispersion modeling output generated as part of a permit application or control strategy has been utilized?
6. If the network is suitable to measure the appropriate spatial scale of representativeness for selected pollutants.
7. If there are monitoring data spatial redundancies or gaps that need to be eliminated.

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J. POLLUTANT SPECIFIC SUMMARY - PM

Questions for PM_{2.5} Continuous Monitors (e.g., ARM/FEM or other method)

If applicable, ensure that the Assessment covers each of the following:

1. Has the agency developed a plan to transition to continuous FEM's
2. Does the agency have a preferred PM_{2.5} continuous method that supports AQI forecasting and reporting?
3. Does the method meet the Data Quality Objective's (DQO's) compared to collocated FRM's?
 - a. Within +/- 10% total bias
 - b. Above 0.9 for correlation (0.81 r²)

Questions for PM_{2.5} Chemical Speciation Network (CSN)

1. Is there a CSN site at the design value location for any CBSA violating the NAAQS? If not at the design value location, explain if the existing location is appropriate for characterizing chemical species or if the CSN needs to move. Note: Moving Speciation Trends Network (STN) Stations is discouraged as these are intended to be long-term operated stations to support a number of objectives.
2. For most areas the design value location will be applicable to both the daily and annual NAAQS, but in limited situations this may not be the case. Explain if this is not the case and what it means for interpreting speciation data.

Question for PM₁₀

1. Does the agency have a plan to transition any remaining important PM₁₀ stations to either low-volume or continuous methods?

K. POLLUTANT SPECIFIC SUMMARY – Ozone and Precursors

Questions for Ozone

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1. Does the site still meet the network design requirements? (i.e., downwind maximum concentration site) Ensure discussion on this question addresses:
 - a. How population shifts affect a site still being appropriate as the downwind maximum concentration ozone site.
 - b. That proximity to nearby roadways has enough buffer so that NO_x titration is not depressing the site as a maximum concentration location (i.e., Appendix E setback requirements)
 - c. Include graphics and figures illustrating wind trajectories, population density, sources, and any other useful information that supports characterizing ozone in a down wind location that represents the highest concentrations of ozone for the CBSA. Identify if the current network supports this location or if a new station is needed.

Questions for Photochemical Assessment Monitoring Stations (PAMS), (if PAMS is applicable)

1. Does the agency have the information to answer whether ozone exceedences are NO_x limited or VOC limited. Identify a typical high ozone episode for the network and whether the ozone maxima are NO_x or VOC limited.
2. How do the PAMS data relate to State Implementation Plans (SIPs) under development or already implemented?
3. Identify target emission pollutants that are being addressed in the SIP. Identify if these are part of local or national controls.
4. Oxides of nitrogen being targeted for emission reductions?
5. Volatile Organic Compounds being targeted for emission reductions.
6. Describe the PAMS data used or that will be used to assess progress in these control programs.
7. Does the agency have access to its own or other agency data to assess air pollution being transported into PAMS areas?
8. Is the location of the type 2 PAMS station still appropriate?
9. Is the location of the type 3 PAMS station still appropriate?
10. Does the PAMS network still meet the network design requirements? (i.e., downwind maximum concentration site)
11. How are you meeting the requirements for upper air measurements? Is this meeting the needs of your agency air quality forecasters and SIP planners?

L. POLLUTANT SPECIFIC SUMMARY – Additional NAAQS Gases

Questions for Carbon Monoxide (CO)

1. Are the objectives of CO sites clearly stated and appropriate?
 - a. Smaller scale sites for mobile impacts
 - b. Area-wide sites collocated with other pollutants

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Questions for Sulfur Dioxide (SO₂)

1. Are source-oriented sites in the area of expected maximum concentration
2. Based on EPA's proposed changes, what are:
 - a. Candidates to keep to support the new monitoring requirements
 - b. Candidates for removal because they do not support the existing or proposed requirements and are of low value relative to other objectives

Questions for Nitrogen Dioxide (NO₂)

1. Are the objectives of NO₂ sites clearly stated and appropriate?
 - a. Are area-wide sites appropriate to support the NAAQS
 - b. Are the area-wide sites collocated with other pollutants
 - c. Are there candidate locations for the near-road component at:
 - i. Existing locations
 - ii. Potential new locations

M. POLLUTANT SPECIFIC SUMMARY – Lead (Pb)

Questions for Lead (Pb)

1. What is the minimum number of sites required for this area?
2. Are you meeting the minimum requirements and if so, how many more monitors do you have beyond the minimums and for what purpose?
3. Considering the latest available emissions inventory does the agency meet the requirements of Part 58, Appendix D:
 - a. Are source-oriented monitors located properly to measure expected maximum concentrations?
 - b. Has the agency considered other lead monitoring stations where the likelihood of Pb air quality violations is significant?

N. TECHNOLOGY

This section provides some questions that can be addressed on technology related areas of a monitoring network.

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Monitors

Describe the status of the monitors. Summarize areas where the agency is satisfied with the current generation of gas monitors, PM samplers, and PM continuous monitors and those areas where it is not. If applicable, explain how the current suite gas monitors models is still appropriate or if a new series of monitors will need to be explored.

PAMS, if applicable

Describe the condition of your PAMS equipment, what the remaining lifetime of this equipment is, and how your agency will transition to any new equipment or different measurements to support PAMS in the next 5 years.

Calibrator (field)

Is the calibrator suitable for ozone and/or trace-level dilutions, if applicable, see Appendix A audit concentrations? Capable of automated QC checks. Internal O₃ generator – photometer preferred.

Calibrator (lab or field)

Suitable for generation of MDL-level concentrations

Zero Air Source

Compliant with NCore TAD recommendations. Ultra-pure air cylinder recommended for occasional comparison to zero air source. Capacity for 20+ LPM of dilution air.

Data acquisition system

Is the data system capable of:

1. Digital-capable system?
2. Remote diagnostics?
3. Remotely enabled checks?

Gas cylinder standards

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Suitable for trace-level dilutions, see Appendix A audit concentrations, EPA Protocol certifications. Special low-level standards needed for MDL concentrations (CO, SO₂, and NO_y)

Meteorological calibration devices

Devices have NIST traceability for required meteorological parameters.

Sampling manifold

Per Appendix E. Residence time <20 seconds, only glass or Teflon materials, probe and monitor inlets acceptable heights.

Auditing equipment

Independent calibrator, zero air source and gas standards compatible with trace level specifications. Independent meteorological and flow standards, if not already available.

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O. CROSS-CUTTING NETWORK CONSIDERATIONS

Training considerations – Monitors and SOP's

Does the agency have a long-term strategy for aligning all of its equipment for a measurement using the same make and model?

What other monitoring programs are leveraged in the network? Identify all other leveraged networks

SLAMS - NCore, CSN, PAMS

Air Toxics – NATTS, UATMP

Deposition – CASTNET, NADP, MDN

Academic Research Programs

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ATTACHMENT A - NAAQS SUMMARY:

This table provides a quick summary of each NAAQS level, any applicable proposed changes that agencies should consider, and the expected date for a final decision.

Pollutant	NAAQS Level	Status of Current NAAQS Review	Proposed Changes?	Expected Date of Final Decision?
Ozone	0.075 ppm 8-hour	Reconsideration of level and secondary NAAQS	Proposal expected in December 2009	August 2010
CO	9 ppm 8-hour 35 ppm 1-hour	Early in Review		May 2011
SO ₂	0.03 ppm annual 0.14 ppm daily	Proposal published on December 8, 2009	Proposal to revise primary to a level of between 50 and 100 ppb measured over one-hour	June 2010
NO ₂	53 ppb annual mean New - 100 ppb one-hour	Final Rule signed with new one-hour NO ₂ NAAQS at 100 ppb. Retained annual average of 53 ppb. Includes provisions for near-roadway monitoring network.		Final Rule was signed on January 22, 2010
PM _{2.5}	15 µg/m ³ annual average 35 µg/m ³ daily	Integrated Science Assessment nearing completion; Visibility Assessment and Risk and Exposure Assessment just reviewed by CASAC	Proposal expected by November 2010 – subject to change	July 2011 – subject to change
PM ₁₀	150 µg/m ³ daily			
Pb	0.15 ug/m ³ rolling 3-month average	Reconsideration of Monitoring Requirements		Mid 2010

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ATTACHMENT B - MONITORING STRATEGIES FOR EXISTING AND POSSIBLY REVISED NAAQS MONITORING NETWORKS

This table summarizes the monitoring strategy for each of the NAAQS pollutants. This table is provided for convenience, however, agencies are strongly encouraged to reference 40 CFR Part 58, Appendix D for additional specifics.

Pollutant	Requirement(s)	Provisions for Locating a Site
Ozone	“...at least one O ₃ site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular area. More than one maximum concentration site may be necessary for some areas.”	Appendix D, Section 4.1 - The “...maximum concentration monitor site should be selected in a direction from the city that is most likely to observe the highest O ₃ concentrations, more specifically, downwind during periods of photochemical activity. In many cases these, these maximum concentration sites will be located 10 to 30 miles or more downwind from the urban areas where maximum O ₃ precursor emissions originate.”
CO	Appendix D, Section 4.2 - “Where SLAMS CO monitoring is ongoing, at least one site must be a maximum concentration site for that area under investigation.”	Appendix D, Section 4.2 - “Carbon monoxide maxima occur primarily in areas near major roadways and intersections with high traffic density and often poor atmospheric ventilation.”
SO ₂	PROPOSED – See Appendix D, Section 4.4 in proposal	
NO ₂	Appendix D, Section 4.4 – “(a) Within the NO ₂ network, there must be one microscale near-road NO ₂ monitoring station in each CBSA with a population of 500,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts...” AADT means the annual average daily traffic.	Appendix D, Section 4.4 “(1) The near-road NO ₂ monitoring stations shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, where maximum hourly NO ₂ concentrations are expected to occur and siting criteria can be met in accordance with appendix E of this part.”
PM _{2.5}	Appendix D, Section 4.7 – Table D-5 provides Minimum Monitoring Requirements.	Appendix D, Section 4.7 (b) – “the required monitoring stations or sites must be sited to represent community-wide air quality.” “These monitoring stations will typically be at neighborhood or urban-scale; however, ...” (1) At least one monitoring station is to be sited in a population-oriented area of expected maximum

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Pollutant	Requirement(s)	Provisions for Locating a Site
		<p>concentration.”</p> <p>(2) For areas with more than one required SLAMS, a monitoring station is to be sited in an area of poor air quality”</p> <p>(c) “The most important spatial scale to effectively characterize the emissions of particulate matter from both mobile and stationary sources is the neighborhood scale for PM_{2.5}.”</p>
PM ₁₀	Appendix D, Section 4.6 – Table D-4 provides Minimum Monitoring Requirements.	Appendix D, Section 4.6 – “(b) although microscale monitoring may be appropriate in some circumstances, the most important spatial scale to effectively characterize the emissions of PM ₁₀ from both mobile and stationary sources are the middle scales and neighborhood scales.”
Pb	Near source monitors required; EPA reconsidering other monitoring requirements	Appendix D, Section 4.5 – “At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each Pb source which emits 1.0 or more ton per year based on either the most recent National Emissions Inventory or other scientifically justifiable method and data...”

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ATTACHMENT C – MONITOR AND STATION NETWORK SUMMARY

There are several fields that should be used to describe the sites and monitors in a network. The following table provides a hypothetical example of some of the key fields that may be helpful to include. Since there are fields applicable to a site and then more applicable to each monitor, there are several ways this information can be organized. Agencies are encouraged to use these and other fields useful for describing their network. On the right hand side of the table there are some additional columns that are intended to describe the relative value and potential plans for each site and monitor. Note: Another way to organize this information is to provide the site summary information with a map and view of the site and then detail each monitor associated with the site in a table.

Site Name	Site ID	City, County	Site Start Date	Latitude Longitude	Location Setting	Monitor Type	Measurement Scale	Monitoring Objective	Pollutant /Method	Assigned Value from Assessment	Straw for Optimization
East Side High	xx-xxx-xxxx	Centerville, Elk County	January 1, 1987	xx.xxxxxx - xx.xxxxxx	Urban	SLAMS	Neighborhood	Population Exposure	PM _{2.5} FRM	Critical – above NAAQS and design value for PM _{2.5}	Keep FRM – explore opportunities to use an FEM
									PM _{2.5} Continuous	Credible – supports AQI	
									PM _{2.5} Speciation	Critical – above NAAQS and design value for PM _{2.5}	Keep
						SLAMS	Neighborhood	Population Exposure	CO	Credible – Collocated and meets potential need for area-wide	Table until NAAQS review is completed
					SLAMS	Neighborhood	Population Exposure	NO ₂	Credible - Collocated and meets need for area-wide, but low reading relative to revised NAAQS	Could be proposed as area-wide site for NO ₂	
Elk County Park	xx-xxx-xxxx	Eastfork, Elk County	April 15, 1980	xx.xxxxxx - xx.xxxxxx	Suburban	SLAMS	Urban	Population Exposure	O ₃	Critical - design value for ozone	Keep
						SLAMS	Urban	Population Exposure	PM _{2.5} FRM	Low –not design value for NAAQS and highly correlated with higher reading East Side High Site	Candidate site to discontinue FRM
									PM _{2.5} Continuous	Credible –Although not design value for NAAQS, occasional wood smoke impacted	Keep continuous to support AQI
SLAMS	Neighborhood	Population Exposure	PM ₁₀ FRM	Marginal	Discontinue PM ₁₀ FRM						
New Site -	New–near roadway environment	Centerville, Elk county	New – expected summer 2011	xx.xxxxxx - xx.xxxxxx	Urban	New SPM	Middle	Population Exposure	PM _{2.5}	New - Identified in assessment as area of potential high exposure	Deploy SPM for PM _{2.5} to evaluate level of NAAQS
						New SLAMS	Middle	Population Exposure	NO ₂	New – Required in recent NAAQS	Add new monitor pending available sources

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Examples for Assigning a Value to a Site and/or Monitor:

Note: monitoring agencies should feel free to expand on these examples to communicate how data are used and by whom. Also, monitoring agencies are encouraged to use descriptions other than “Critical, Credible, Marginal, and New” as appropriate to describe the relative value of monitoring stations and equipment in the assessment.

- Critical Sites and Monitors – These sites are of high value and should be protected.
 - Design value site for an area at or above the NAAQS
 - Long-term multi-pollutant site(s) used by multiple data users for trends and model evaluation (i.e., SIP development and tracking).
Note: often these are the design value or other important sites with lots of complimentary measurements
 - Dedicated site for health or atmospheric study, or to inform policy options for State or local agency (often collocated with above; however, if not, a sunset date should be associated with the site)

- Credible Sites and Monitors – These sites are the locations that are expected to continue, but may not be the design value location at or above the NAAQS. Sites in this category are generally protected, but occasionally may move to provide the optimum spatial coverage in a network. Large cities tend to have more of these, while small cities (e.g., less than 500,000 people) may have little, if any. Examples might include:
 - Sites that provide the spatial richness of a network to identify exposures and support AQI forecasting and reporting
 - Sites that while not the design value location are occasionally the highest across the metropolitan area due to seasonal meteorology or unique winds. (e.g., winds are normally from the Southwest, but occasionally come from the East which puts the area downwind of a much larger metropolitan area)
 - Sites that are design value locations; however, the level is relatively low compared to the NAAQS. This might include source oriented monitors that are required, but are below the NAAQS.
 - Sites that may be useful for NAAQS now in review.

- Marginal Sites and Monitors – These sites and monitors are those locations that are candidates for removal or movement. This category includes locations and measurements that:
 - Have outlived their intended purpose
 - Are measurements that are of low value relative to the NAAQS. Also, the monitor is not required. For example, PM₁₀ monitoring in many non-industrial eastern locations.
 - Are not candidates for continued investment due to problems with siting criteria which cannot be resolved.

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- Includes Special Purpose Monitors (SPMs) – If a monitor remains at a site for more than two years it is strongly encouraged that the site become a SLAMS and would fit into the critical or credible category, otherwise it is assumed that the SPM has fulfilled its objective and can be moved to another location to characterize the measurement of interest.
- Sites that correlate well (i.e., are not unique) with a nearby site(s), but which measure low levels than the nearby site.
- New Sites and Monitors – These site represent potential areas of investment pending movement of monitoring resources from other locations or new resources introduced to our program.
 - Locations that may result in a change to the design value location of a pollutant
 - Newly required locations from recent NAAQS reviews
 - Additional measurements at critical and credible locations that would add additional insight to data users