


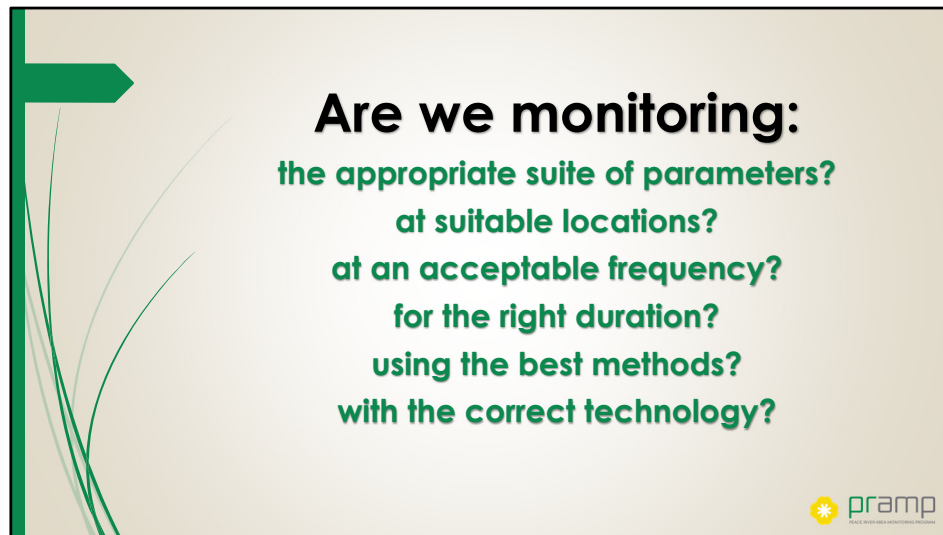
Network Assessment

Introduction and Proposed Project Plan

Prepared for: Technical Working Group
Presented: November 10, 2021
Updated: November 16, 2021 with Notes



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PRACTICE AND RESEARCH IN PROJECT MANAGEMENT

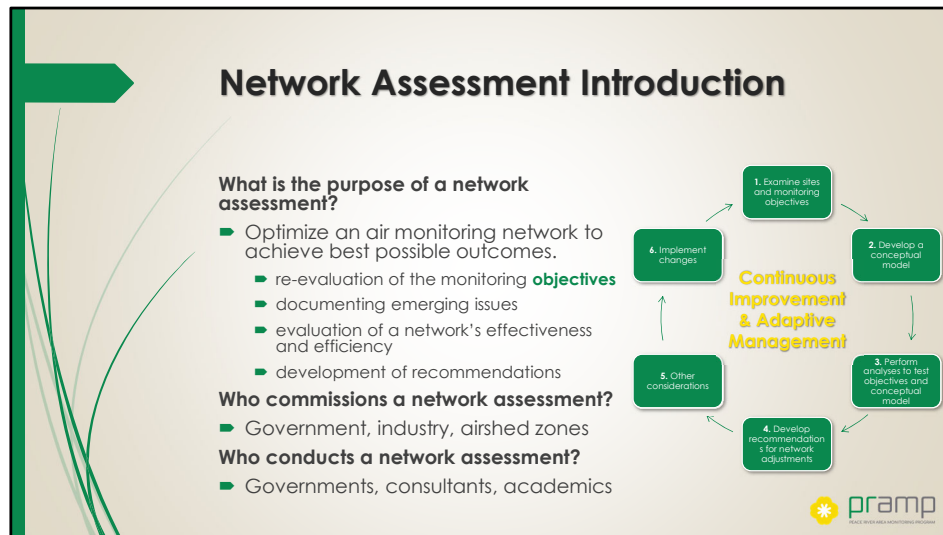


At a high level, network assessments ask some very basic questions.

- The answers to these questions are informed by existing/emerging monitoring objectives and issues.

What are common triggers for conducting a network assessment?

- Air quality has changed.
- Population and industry behaviors have changed.
- New air quality objectives have been established.
- Collective understanding of air quality issues and ability to monitor air quality have both improved.




What is the purpose of a network assessment?

- In general, the purpose of a network assessment is to optimize air monitoring networks to achieve, often with limited resources, the best possible scientific value and protection of public and environmental health and welfare.
- A network assessment includes:
 - re-evaluation of the objectives and budget for air monitoring,
 - documenting emerging issues,
 - evaluation of a network's effectiveness and efficiency relative to its objectives and costs, and
 - development of recommendations for network reconfigurations and improvements.
- Network assessments often make recommendations that carefully:
 - adjust networks to address emerging issues
 - protect today's population and environment
 - maintain the ability to understand long-term historical air quality trends.
- Through network assessments air monitoring organizations can take advantage of the benefits of new air monitoring technologies and improved scientific understanding of air quality issues. Reconfiguring air monitoring networks can enhance their value to stakeholders, scientists, and the general public.

Typical Steps in Conducting a Network Assessment

1. Prepare or update a regional description.
2. Prepare or update a network history.
3. Perform statistical analyses of available monitoring data.
4. Perform situational analyses.
5. Suggest changes to the monitoring network.
6. Acquire stakeholder input and revise recommendations as appropriate.



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PROGRESS THROUGH AIR QUALITY MONITORING

Typical steps in conducting a network assessment

- **Step 1:** Prepare or update a regional description. This step will discuss important features that should be considered for network design.
 - *Inputs: Topography, climate, population, demographic trends, major emissions sources, and current air quality conditions*
- **Step 2:** Prepare or update a network history that explains the development of the air monitoring network over time and the motivations for network alterations, such as shifting needs or resources.
 - *Inputs: Historical network specifications, history of individual monitoring sites*
- **Step 3:** Perform statistical analyses of available monitoring data. These analyses can be used to identify potential redundancies or to determine the adequacy of existing monitoring sites.
 - *Outputs: Site correlations, pollutant analysis (trend analysis, spatial analysis, and factor analysis, comparisons to modeling results).*
- **Step 4:** Perform situational analyses, which may be objective or subjective. These analyses consider the network and individual sites in more detail, taking into account research, policy, and resource needs.
 - *Considerations: Risk of future CAAQS exceedances, demographic shifts, MER requirements, density or sparseness of existing networks, scientific research or public health needs, and other circumstances*
- **Step 5:** Suggest changes to the monitoring network on the basis of statistical and situational analyses and specifically targeted to the prioritized objectives and budget of the air monitoring program.
 - *Outputs: Reduction of number of sites for a selected pollutant, enhanced leveraging with other networks, and addition of new measurements at sites to enhance usefulness of data*
- **Step 6:** Acquire the input of stakeholders and revise recommendations as appropriate.
 - *Outputs: Optimized recommendations.*

Monitoring Objectives

- Monitoring objectives establish network assessment criteria.
- Where do the current monitoring objectives come from?
 - PRAMP Terms of Reference
 - Oil Sands Monitoring Program Workplans
 - Air and Deposition Monitoring, Evaluation and Reporting Framework

Why are monitoring objectives important?



- Before beginning a network assessment, the purposes or objectives of the network must be reviewed and prioritized. Networks are likely to be used to meet a variety of purposes.
- These objectives maybe prioritized as primary or secondary and individual monitors, stations, or sensors within a network may serve different purposes.
- Network assessments measure the successes and shortcomings of monitoring networks’ capabilities to meet their monitoring purposes. Clearly defined monitoring purposes are the basis for the technical assessment of a monitoring network.
- Once the purposes or objectives are defined, appropriate statistical or situational analyses maybe considered and selected to evaluate each.

Where do PRAMP’s monitoring objectives come from?

- PRAMP Terms of Reference (with links to Directive 84, Report of Recommendations on Odours and Emissions in the Peace River Area)
- Oil Sands Monitoring Program Workplans
- Air and Deposition Monitoring, Evaluation, and Reporting Framework

Primary Monitoring Objectives

- Provide high quality data that allows for the assessment of **data trends** and **spatial distribution** of contaminants of concern.
- Provide data used for **community monitoring needs** including health risk assessments, odour mitigation, concentrations in populated areas, and communicating the AQHI.
- Provide data for **cumulative effects** assessment.

Primary Objectives

The PRAMP monitoring network:

- Provides high quality ambient data which, when used in conjunction with the appropriate statistical approach, will allow the assessment of
 - monitoring **data trends**
 - the **spatial distribution** of contaminants of concern in the region, including identifying hot-spots and emerging air quality issues.
- Provides ambient information for **community monitoring needs** including
 - information for human health risk assessments,
 - assessing odours,
 - measuring representative ambient concentrations in populated areas, and;
 - providing information needed to communicate to the public an Air Quality Health Index (AQHI).
- Provides ambient information on **cumulative effects**, to assist in understanding the impact of multiple sources on the quality of air in the Peace River Area. Note that cumulative effects refers to the cumulative impact of multiple emissions sources on air quality; the meaning does not include interaction of air with other media, nor does it include the impact over time.

Note: Key words are **highlighted** for reference and will be revisited at the end of the presentation.

Secondary Monitoring Objectives

- Support monitoring and reporting requirements for regional, provincial, and national **air quality management obligations** including LUF, CAAQS, MER.
- Provide support for **modeling and remote sensing**.
- Provide data to support **regulatory compliance**.
- Provide information needed to understand **transboundary transport** of contaminants.
- Provide information to **distinguish sources** of pollutants.

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PROVINCIAL REGIONAL AMBIENT MONITORING PROGRAM

Secondary Objectives

The PRAMP monitoring network:

- Supports the monitoring and reporting requirements associated with regional, provincial and national **air quality management obligations** including:
 - Information required for the implementation of provincial and regional air quality management strategies (e.g., Upper/Lower Peace Air Quality Management Framework),
 - Information required for CAAQS (Canadian Ambient Air Quality Standards) reporting, and
 - Information required for the implementation of provincial and regional acid deposition monitoring, evaluation, and management frameworks.
- Provides ambient information needed to support **modeling and remote sensing** (e.g. OSM work plans), including suitable input and validation information to verify or calibrate dispersion, transformation, and deposition models, and suitable information to ground truth remote sensing data.
- Provides data to assess **regulatory compliance**.
- Provides information needed to understand **transboundary transport** including characterizing the quality of air entering and leaving the Region.
- Provides information needed to **distinguish sources** of industrial of emissions and other natural and anthropogenic sources.

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Emerging Monitoring Issues

Tier One


- AER Directive 84, implementation of vapor release mitigation technologies, **regional air quality improvements**.


Tier Two

- Integration of **CNUL** compliance monitoring network.
- Integration of the **Mercer** Peace River pulp mill air quality monitoring stations.

Tier Three

- Consideration of air quality **monitoring-deficient areas adjacent** to PRAMP.
- **New technologies**, including micro-sensors.





Emerging Monitoring Issues (grouped according to priority of evaluation)

Tier One

- Hydrocarbon context: emissions reduction, **regional air quality improvement**, a regulatory framework for CHOP is in place (Directive 84), mitigation measures have been implemented. How do these changes inform the optimization of PRAMP's monitoring program?

Tier Two

- The air monitoring station and 12 passive monitors at the Peace River Complex are currently being operated by **CNRL** and are anticipated to be added to the PRAMP network in the near future. PRAMP would like to understand if or how the overall monitoring network could be optimized while still meeting the monitoring objectives.
- PRAMP has been asked to consider incorporating the **Mercer** (pulp and paper mill) air quality monitoring into the PRAMP network. The monitoring would be done on a fee for service basis, and in compliance with Mercer's EPEA approval. If the two Mercer stations were incorporated into PRAMP's program, PRAMP would like to understand if or how the overall monitoring network could be optimized while still meeting the monitoring objectives.

Tier Three

- There is a large **monitoring-deficient area adjacent to area** to the north and west of PRAMP boundaries where there is no Airshed and limited or no monitoring. Are there any emerging air quality issues in the area just outside PRAMP's boundaries that PRAMP should consider in its monitoring program?
- With the growth of access to and interest in lower-cost **new technologies** for monitoring air quality, how could they best be incorporated in the PRAMP monitoring program? (e.g., Purple Air sensors).

Note: Key words are **highlighted** for reference and will be revisited at the end of the presentation.



Deliverables

- ▶ Ranked recommendations for optimization of PRAMP's monitoring program.
 - ▶ Which monitoring objectives are being achieved? Which monitoring objectives are not? So what?
 - ▶ Monitoring Program Objectives key words: **data trends, spatial distribution, community monitoring needs, cumulative effects, air quality management obligations, modeling and remote sensing, regulatory compliance, transboundary transport, distinguish sources.**
 - ▶ How should PRAMP address the emerging monitoring issues?
 - ▶ Emerging monitoring issues key words: **regional air quality improvements, CNUL, Mercer, adjacent areas, new technology**
- ▶ Summary of other aspects and observations.





Project Administration

- The network assessment will be a project of the Technical Working Group (TWG).
 - The TWG will provide input and guidance over the life of the project.
- There will be input from external organizations as needed.
- Staff will act as project managers.
- Board of Directors is responsible for decisions related to
 - evaluation of network assessment recommendations,
 - implementation strategy for network assessment recommendations, and;
 - financial matters.



Timeline

- **Nov 10, 2021** Network Assessment project introduced to TWG.
- **Nov 23, 2021** TWG provides feedback project plan.
- **Dec 1, 2021** Board of Directors approves project plan and budget.
- **Dec 17, 2021** Request for proposal is approved by TWG.
- **Jan 3, 2022** Request for proposal is released, posted, and distributed.
- **Jan 24, 2022** Proposals received, staff begin screening.
- **Feb 4, 2022** TWG makes recommendation to BoD, contract awarded.
- **Feb 11, 2022** Project kickoff with consultant.

