

(Draft) Interpretation of Air Quality Model Results For Regulatory Applications in Alberta

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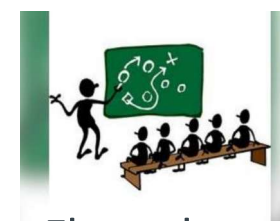
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Alberta 

Interpretation of Air Quality Model Results

Outline

- Alberta's Industrial Air Quality Management System
- Interpreting and Acting on Air Quality Modelling Assessments
 - General Considerations: AAAQO Exceedances (excluding AAAQGs for Odour Management)
 - Special Considerations: High Baseline Concentrations, Nearby Facilities
 - Other Exceedances: Acid Deposition, Odour
- Monitoring Plans
- Management Plans



Flow chart

Interpretation of Air Quality Model Results

Currently this document is titled:

“Using Ambient Air Quality Objectives in Industrial Dispersion Modelling and Individual Site Monitoring” (2013)

Why do we need to update this document?

What do we need to update?



Clarity



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General Considerations: AAAQO Exceedances (excluding AAAQGs for Odour Management)

Normal Operations



Most assessments – follow **AQMG** (one modelling scenario)
but...in a few cases may be an **unusual source configuration** or
complex dispersion process

New facilities
or
amendments

1. Approved **Ambient air monitoring plan** and **management plan**.
2. Approved **Management plan**.

Renewals

1. May use **historical monitoring** if it meets monitoring requirements.

Option 1:

Inefficient iterative process:

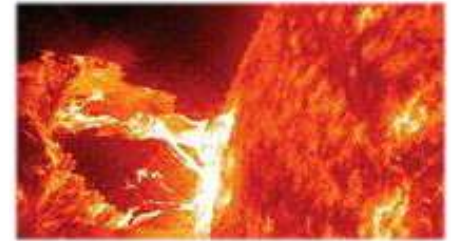
Redesigns are best implemented as part of the original construction.

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General Considerations: AAAQO Exceedances (excluding AAAQGLs for Odour Management)

Non-routine Operations

1. Non-routine flaring events: Alberta Energy Regulator's [D60](#)
2. All other upsets allowed tolerance:
 - **Hourly:** 1% annual allowance (87 hours/year)
1.5 x [AAAQO]
 - **24-Hour:** 1% annual allowance (four 24-hour periods/year)
1.5 x [AAAQO]
 - **Longer averaging periods:** not allowed



For any 24-hour averaging period, if one hour or more is declared an upset the 24-hour period is considered an upset period

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Special Considerations: Influence of baseline and nearby facility

Who are the significant non-project contributors to a project's exceedance?

Significant if contributing > 30% of [AAAQO]

- Unambiguous assignment
- Focus management actions to make improvement

Regardless of the significance of the contribution of external contributors the proponent is always responsible for managing their emissions.

- Impacts what needs to be done
- How quickly it must done

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Special Considerations: Influence of baseline and nearby facility

Scenario 2: No significant contribution from nearby sources and a significant contribution from baseline

Substance: NO2					
AAAQO: 300 ug/m ³					
Source Apportionment of Each Source, No Baseline - Sum: 270 ug/m ³			All Sources - Max: 415 ug/m ³ , Baseline: 200 ug/m ³		
	Conc. [ug/m ³]	% Conc., No Baseline	Estimated Conc. [ug/m ³], No Baseline	Estimated Total Conc. [ug/m ³]	% [AAAQO]
Source A (Proponent)	183	67.8	146	146	48.7
Source B	34	12.6	27	27	9.0
Source C	53	19.6	42	42	14.0
Total	270	100	215	200	66.7
			Total	415	

Estimated contribution determined from each group of sources as a percentage of total contribution but applied to all sources. Consideration developed to determine if baseline will increase effects remaining the same

Baseline

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Other Exceedances: Acid Deposition

AQMG: Acid deposition (wet and dry)

Acid Deposition Management Framework (**ADMF**): Calculate deposition relative to **CL**

If deposition > CL then consult ADMF to determine if Acid Deposition Management Zone Plan (**ADMZP**) exists.

If plan exists then **follow specified actions** to minimize acidification.

If plan does not exist then develop and implement:

1. Acid deposition **monitoring plan** and **management plan**.
2. Acid deposition **management plan**.



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Other Exceedances: Odour



[9 Reasons Why Odour Monitoring is Crucial for Landfills \(oizom.com\)](http://oizom.com)

When modelling predicts a concentration above an **AAAQG for Odour Management**, then develop and implement:

1. **Odour monitoring plan** and **odour management plan**
2. **Odour management plan**

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Monitoring Plans: Non-odour Monitoring

Monitoring plans may only be implemented in conjunction with a management plan

1. All substances predicted to exceed an AAAQO or AAAQG
2. Suitably placed
3. Calibrated and maintained as specified in the Air Monitoring Directive, AMD
4. Sufficient temporal coverage
5. Any other monitoring requirements specified by the Director

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Monitoring Plans: Acid Deposition

If ADMZP is in place then follow requirements specified there. Otherwise:

1. Monitoring of **wet** and **dry acid deposition rates**
2. Appropriate **soil sampling**

Monitoring plans may only be implemented in conjunction with a management plan



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Monitoring Plans: Odour

Monitoring plans may only be implemented in conjunction with a management plan



[D-NOSES course on odour pollution \(MOOC for general public\) – Odour Observatory](#)

For **new facilities** or **amendments** the proponent should include, at a minimum:

1. Follow the guidance provided for monitoring AAAQGs – may be ongoing
2. **Complaints** may also form part of a monitoring plan (**FIDOL, actions to mitigate**)

For **renewals** the proponent should include, at a minimum:

1. If a monitoring plan **already in place** – check it is acceptable
2. If **does not exist** prepare plan as required for a **new facility** or **amendment**

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Monitoring Plans: Reporting

Monitoring plans may only be implemented in conjunction with a management plan

At the end of the required monitoring period must submit a summary report.

1. Confirmation that the monitoring was **acceptable/passed all requirements**.
2. Determine if any exceedances occurred:
 - a. If **exceedances occurred** implement the **management plan**.
 - b. Otherwise, **monitoring complete**, confirm no further action required.

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Management Plans: Non-odour Management

- Background**
1. Summary of relevant information
 2. Any requirements specified regional plan/provincial policy
 3. Anticipated growth in the area

- Actions**
1. Proposed changes to operational procedures
 2. Proposed changes to pollution abatement technology
 3. The operational/capital costs
 4. Rationale for the choice of technology

- Check**
1. A clear demonstration of effectiveness of proposed changes.



<https://mal-tel.com/environment-management-plan>

Any additional information requested by the Director

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Management Plans: Acid Deposition Management

Background 1. As per AAAQGS for non-odour management

Actions 1. If ADMZP exists then follow it
2. In the absence of an ADMZP then reduce the likelihood of exceeding a CL.

Check 1. A clear demonstration of effectiveness of proposed changes.

Any additional
information requested by
the Director

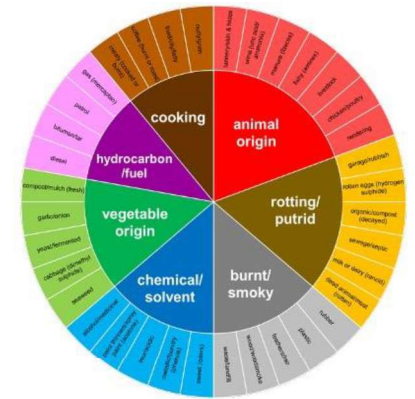
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Management Plans: Odour Management

Background 1. As per AAAQGS for non-odour management

- Actions**
1. Reduce emission of **odourous substances**. Include (FIDOL) impact on **sensitive receptors**
 2. Share information on status/effectiveness of plan

Check 1. A clear demonstration of effectiveness of **proposed changes**



[Odour management | USEPA](#)

Any additional information requested by the Director

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Management Plans: Implementation

The schedule for any required changes should consider:

1. The degree of the contribution of the proponent to any exceedances.
2. The impact on sensitive receptors.
3. Future growth in the area.

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Management Plans: Implementation

The management plan must include a **timeline for completion** of changes approved by the Director.

The management plan is **deemed complete** once all approved requirements are deemed complete.

For the management of odour against AAAQGs for **Odour Management** actions should be implemented at the time of issuing the approval but may be active for the duration of the approval (Director).



[Alarm Clock Icon Animation by kb Duncan on Dribbble](#)

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Questions?

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