

# AIR QUALITY REGULATORY UPDATE- WHAT'S COMING UP THE PIPE?

SK Ministry of Environment  
Technical Resources Branch

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# Outline

- SK Environmental Code – Air Quality
- SK Ambient Air Quality Standards
- Air Zone Management in SK
- Multi-Sector Air Pollutants Regulations

# SK Environmental Code – Air Quality

- Code became effective June 1, 2015.
- *The Environmental Management Protection Act (EMPA) 2002, The Clean Air Act and The Clean Air Regulations, The Potash Refining Air Emissions Regulations* were all repealed.
- The *Industrial Air Quality Source Chapter* came into place - regulates large and high risk emitters. The Chapter captures mines or solution mines, and associated facilities.
- Clean air permits are no longer issued. Instead, industrial “air” sources - large emitters / high risk sites will be required to submit Environmental Protection Plans (EPPs).
- Existing clean air permits are being transitioned to EPPs while new industrial sources are submitting EPPs.

# Industrial “Air” Quality Source Chapter Objectives

Any person or company shall:

- Site an industrial source in an acceptable location to minimize impacts
- Meet Saskatchewan’s Ambient Air Quality Standards (SAAQS)
- Meet Saskatchewan’s Emission Limit Standards
- Follow Saskatchewan’s Air Modelling Guideline at <http://publications.gov.sk.ca/documents/66/80061-English.pdf>
- Conduct monitoring by following Saskatchewan’s Air Monitoring Guideline at <http://www.publications.gov.sk.ca/details.cfm?p=71865>
- Join an Air Zone – [www.wyamz.ca](http://www.wyamz.ca) or [www.sesaa.ca](http://www.sesaa.ca) or [www.gpaz.org](http://www.gpaz.org)

# Saskatchewan's Ambient Air Quality Standards

- Saskatchewan Ambient Air Quality Standards (SAAQS) were brought up-to-date on June 1, 2015 and are now similar to other western provinces.
- Saskatchewan Environmental Quality Standards (SEQS) house SAAQS.
- Work to establish CAAQS for SO<sub>2</sub> and NO<sub>2</sub> have been underway over the last two years.
- Environment Ministers endorsed new SO<sub>2</sub> CAAQS on October 3, 2016.
- The ministry won't change the SO<sub>2</sub> and NO<sub>2</sub> SAAQS until it engages with impacted stakeholders.

Air Pollutant	Maximum Allowable Concentration in µg/m³ (ppb) Averaged over Applicable Time Period			
	1 Hour	8 Hours	24 Hours	Annual
Particulate Matter (PM <sub>2.5</sub> )			28	10
Particulate Matter (PM <sub>10</sub> )			50	
Total Suspended Particulates			100	60
Nitrogen Dioxide (NO <sub>2</sub> )	300 (159)		200 (106)	45 (24)
Sulphur Dioxide (SO <sub>2</sub> )	450 (172)		125 (48)	20 (8)
Hydrogen Sulphide (H <sub>2</sub> S)	15 (11)		5 (3.6)	
Ozone (O <sub>3</sub> )	160 (82)	124 (63)		
Carbon Monoxide (CO)	15000 (13000)	6000 (5000)		

# Air Zone Management

- The ministry created the first air zone in 2005 with the intent of having up to six air zones to encompass the entire province, pending the effectiveness of the first one in the South East area.
- An air zone can be characterized as a geographic region within any province or territory in Canada that has comparative air quality challenges and emission characteristics.
- A non-profit organization (air zone) is formed with representation from industry, government, non-government agencies and the public.
- The ministry provides start-up money.
- The air zone management approach is a successful voluntary program built on consensus-based decision-making and partnerships that are over 90 per cent voluntarily funded by industry.

# Delineation (Boundaries)

Saskatchewan designed air zones based on:

- degree of threat to air quality by the number and distribution of air emitters
- identification of local and regional air issues
- National Pollutant Release Inventory (NPRI) data
- non-point sources and other potential contributors
- meteorological data
- administrative boundaries
- sufficient number of emitters to financially support the air zone



# AIR MONITORING SITES

## Continuous Analyzers

-  Saskatchewan Ministry of Environment  
Parameters: Table 1
-  National Air Pollution Surveillance Program (NAPS)  
Parameters: Table 1
-  Southeast Saskatchewan Airshed Association (SESAA)  
Parameters: Table 2
-  Western Yellowhead Air Management Zone (WYAMZ)  
Parameters: Table 3

Table 1. Saskatchewan Ministry of Environment Sites

COMMUNITY	PARAMETERS
Buffalo Narrows	NO <sub>2</sub> , NO <sub>x</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
Prince Albert	NO <sub>2</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
Regina	O <sub>3</sub> , NO <sub>2</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , VOC
Swift Current	NO <sub>2</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>

 National Air Pollution Surveillance Program (NAPS) Stations  
in collaboration between the federal government and provincial governments

Table 2. Southeast Saskatchewan Airshed Association Sites

COMMUNITY	PARAMETERS
Estevan	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub>
Estevan	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
Gravelbourg	NO <sub>2</sub> , O <sub>3</sub> , SO <sub>2</sub>
North Battleford	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
North Battleford	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
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North Battleford	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>

Table 3. Western Yellowhead Air Management Zone Sites

COMMUNITY	PARAMETERS
Weyburn	NO <sub>2</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
Weyburn	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
Weyburn	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>
Weyburn	NO <sub>2</sub> , NO <sub>x</sub> , NO <sub>3</sub> , O <sub>3</sub> , PM <sub>2.5</sub> , SO <sub>2</sub>

NOTE: All stations measure wind speed/direction, temperature, relative humidity, and barometric pressure.




## Wet-Deposition

-  National Acid Deposition Program (NADP) sites sponsored by the Saskatchewan Ministry of Environment  
Parameters: mainly sulphur and nitrogen
-  Saskatchewan Ministry of Environment  
Parameters: pH, conductance, acidity, sulphate, nitrate, ammonium, sodium, chloride, potassium, calcium, magnesium, ortho-phosphate

## Passive Sampling

-  SASKATCHEWAN MINISTRY OF ENVIRONMENT  
Parameters: NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>
-  Parameters: H<sub>2</sub>S, NO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>

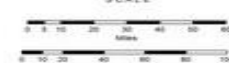
## Federal Government (and partners) Monitoring

-  National Pollutant Release Inventory (NPRI)
-  Boreal Ecosystem Research and Monitoring Sites (BERMS)
-  Canadian Acid Precipitation Monitoring Network (CAPMoN)

## SYMBOLS

-  Urban Municipality
-  Dual Highway
-  Primary Highway
-  Secondary Northern Highway
-  Railway
-  Water Body
-  National Park
-  Rural Municipality
-  Air Weapons Range

SCALE



Topographic Map Projection  
North American Datum 1983 (NAD83)

September 2011

# Benefits

The benefits of air zone management are:

- generating credible data to help manage regional air quality
- spreading program operating costs among emitting stakeholders
- providing the opportunity to build relationships among stakeholders
- offering an effective forum for open discussion
- creates high public trust due to the open process and direct public involvement
- providing everyone access to real-time air monitoring data via the internet and serves as an excellent public relations and education tool

# Air Zone Management Teams

## GPAZ

Mining  
Petroleum Refining  
Steel Production  
SK Health  
Municipal  
ENGO  
Ministry

[www.GPAZ.org](http://www.GPAZ.org)

## SESAA

Mining  
Power  
UOG Sector  
SK Health  
Urban and  
Rural  
Municipalities  
SK Economy

[www.sesaa.ca](http://www.sesaa.ca)

## WYAMZ

Mining  
Petroleum Refining  
UOG Sector  
Chemical Processing  
SK Health  
Municipal  
ENGO  
Academia  
SK Economy  
Ministry

[www.wyamz.ca](http://www.wyamz.ca)

## Grasslands

Mining  
Power  
UOG Sector  
SK Health  
SK Economy  
Ministry

## Boreal

Mining  
Forestry  
New North  
SK Health  
CNSC  
ENGO  
Gov't  
Relations  
Ministry

## Northeast

Mining  
Forest Products  
Wood Processing  
SK Health  
Agriculture  
Ministry

# Overview

- The first air zone was set up in 2005 in southeastern SK due to the highest asthma rates in the province and concentrated industrial activity.
- The final air zone (Northeast) was incorporated as a non-profit in November 2015.
- All air zones form a Board of Directors to oversee its operations.
- Five air zones have Executive Directors to manage their day-to-day activities.
- Through collaboration with Environment and Climate Change Canada and the six air zones, the ministry has increased regional air monitoring across the province over the last decade from two to 20 continuous air monitoring stations.

# Overview

- Air zone management provides the adaptability to consider provincial contrasts while also providing a integrated strategy throughout Canada.
- Air zone monitoring is performed by independent contractors.
- The importance of a robust communication network is a key component in understanding and acting upon air quality issues.
- Diversity of Saskatchewan's air zone management teams illustrates the ministry's commitment to an open and transparent process.
- The data collected in local air zones across the country is reported under the Air Quality Management System Framework requirements on an annual basis.



# Last Years Activities

- Submitted SK's 2011-2013 air zone report to CCME
- Northeast Air Zone Board established
- Grasslands and Northeast air zones hired Administrators
- Boreal Air Zone report contracted and completed to inventory emissions and monitors
- Commenced project to secure a central server to act as a repository for all air quality data (Ministry and Air Zones)
- Agreed on an AQHI+ pilot project with Environment and Climate Change Canada in the SESAA and the WYAMZ

# Reporting Thresholds

Table 1. Air Zone Management Framework

Management Level	Ozone Daily max 8h (ppb)		PM <sub>2.5</sub> Annual (µg/m <sup>3</sup> )		PM <sub>2.5</sub> 24h (µg/m <sup>3</sup> )	
	2015	2020	2015	2020	2015	2020
Red	Actions for Achieving Air Zone CAAQS					
Threshold (CAAQS)	63	62	10	8.8	28	27
Orange	Actions for Preventing CAAQS Exceedance					
Threshold	56		6.4		19	
Yellow	Actions for Preventing Air Quality Deterioration					
Threshold	50		4		10	
Green	Actions for Keeping Clean Areas Clean					

# Multi-Sector Air Pollutant Regulations (MSAPRs)

- Environment and Climate Change Canada (ECCC) officially published the *Multi-Sector Air Pollutants Regulations* (MSAPRs) in *Canada Gazette*, Part II on June 29, 2016.
- This is the first phase of Base Level Industrial Emission Requirements (BLIERs) to become federal regulations. These are federal regulations and there is no role for the ministry at this time.
- To gain some familiarity with the MSAPRs:  
<http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=220>
- There is mention in the MSAPRs about the creation of equivalency agreements with the Federal Government so province and territories could become the lead regulator.



# MSAPRs

- Key elements of these regulations. The regulations include mandatory performance standard requirements for:
  - Nitrogen oxide ( $\text{NO}_x$ ) emissions from large boilers and heaters that burn gaseous fossil fuels, such as natural gas, and which are used in several industrial sectors
  - $\text{NO}_x$  emissions from stationary spark-ignition engines that burn gaseous fuels, such as natural gas, and which are used by several industrial sectors
  - $\text{NO}_x$  and sulphur dioxide ( $\text{SO}_2$ ) emissions from cement manufacturing facilities - SK has no active cement manufacturing facilities

# MSAPRs – Boilers and Heaters

- There are approximately 75 existing boilers and heaters in SK impacted by these regulations.
- The Husky BPU falls into the oil sands sector based on the crude processed at their facility.
- Boilers and heaters at Consumer Refinery Complex are exempt from these regulations at this point.
- From the 75 existing SK boilers and heaters it is predicted that only one unit at a potash mine emits above the 70 g/GJ and will need to be modified / replaced by 2026/2036.
- The remaining 74 will have no further obligations after initially reporting their emissions.

# MSAPRs

The table below shows the NPRI registered boilers and heaters in SK:

Sector	Estimated Number of Units in Saskatchewan, 2011	Estimated Number of Units in Saskatchewan, emitting above 70 g/GJ, 2011
Chemical	9	0
Fertilizers	2	0
Oil Sands	15	0
Potash	24	1
Pulp and Paper	1	0
Upstream Oil and Gas	24	0
Total	75	0

# MSAPRs – Reciprocating Engines

- There are approximately 150 reciprocating engines in SK impacted by these regulations which are found primarily in the upstream oil and gas (UOG) sector.
- The vast majority of UOG engines in Canada are located in BC and AB with more than 95% of these engines located in the upstream oil and gas sector and the natural gas transmission pipeline sector.
- AB has > 5000 engines impacted by these regs.
- Other industrial sectors impacted in SK are chemicals and fertilizers, electricity, steel, oil sands, potash, pulp and paper, and petroleum refineries.

# MSAPRs – B & H Implementation

- The regulations include separate coming-into-force provisions for covered sector and equipment types, including:
  - Boilers and heaters put into service after the regulations come into force are subject to an emission limit for NO<sub>x</sub>.
  - All existing boilers and heaters whose NO<sub>x</sub> emission intensity exceeds 70 g/GJ have an obligation that is phased in over the initial 20 years.
  - All owners or operators of existing boilers and heaters must send ECCC, within the first 18 months of the regulations coming into effect, a report that classifies their existing equipment.

# MSAPRs – Recip Engines Implementation

- The regulations include separate coming-into-force provisions for covered sector and equipment types, including:
  - Reciprocating engines manufactured on or after September 15, 2016 are subject to an emission limit.
  - New engines must be registered within a year of starting operation.
  - Existing engines must be registered by 2019.
  - Existing engines must meet NOx emission limits which are phased-in, with a first phase starting in 2021 and a more stringent second phase in 2026.

# MSAPRs – Equivalency Agreements

- The MSAPRs reference the creation of equivalency agreements with the Federal Government so province and territories could become the lead regulator.
- No formal discussions have transpired between the Federal Government and the ministry related to equivalency agreements.
- The MSAPRs are fairly prescriptive in nature compared to the ministry's results-based regulatory approach.
- In order for Saskatchewan to become the lead regulator, provincial legislation will need to meet the Federal Government's expectations, and demonstrate that it is the best-placed jurisdiction to oversee the implementation of the MSAPRs.

# Next Steps

- Ministry to continue working with industry to transition to Environmental Protection Plans.
- Ministry to determine potential changes to SO<sub>2</sub> and NO<sub>2</sub> SAAQS by engaging impacted stakeholders.
- Bring Air Zone representatives together to look at province-wide synergies.
- Determine if there is any provincial role in the federal government's *Multi-Sector Air Pollutants Regulations* (MSAPRs)?



# Links

- SK Code: <http://www.saskatchewan.ca/business/environmental-protection-and-sustainability/environmental-code>
- SK Ambient Air Quality Standards: <https://envrbrportal.crm.saskatchewan.ca/Pages/SEQS/Table20-SEQS-SAAQS.pdf>
- SK Emission Limit Standards: <https://envrbrportal.crm.saskatchewan.ca/Pages/SEQS/Table21-SEQS-EmissionLimit.pdf>
- CCME AQMS: <http://www.ccme.ca/en/resources/air/aqms.html>
- SK Air Zones: [www.wyamz.ca](http://www.wyamz.ca)   [www.sesaa.ca](http://www.sesaa.ca)   [www.gpaz.org](http://www.gpaz.org)
- Federal Government's MSAPRs: <http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=220>

# Questions?

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