



PASZA

Peace AirShed Zone Association



2003 Annual Report



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1.0 Introduction

The Peace Airshed Zone Association (PASZA) is a multi-stakeholder non-profit organization consisting of industry, local government, environmental non-government organizations (ENGOS), Alberta Environment, Alberta Energy & Utilities Board, the local health authority, and members of the public. PASZA was formed in March 1999 in response to concerns over air quality in the Grande Prairie Region and because of the desire of Industry, Government, ENGOS and the Public to work together to better understand and address these concerns.

The PASZA Mission Statement is:

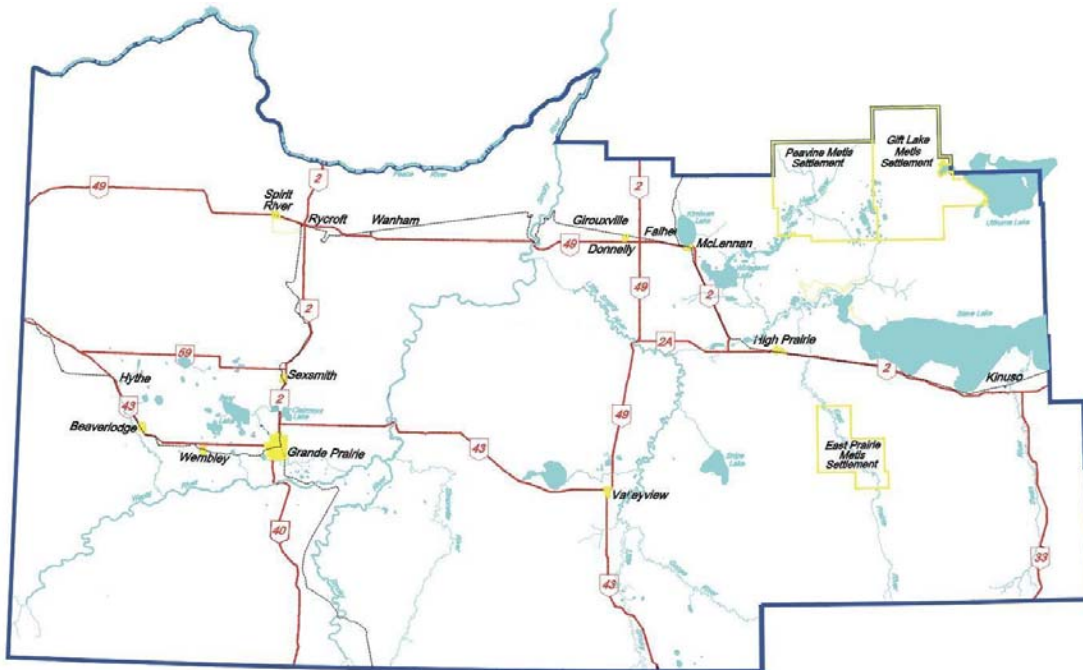
The Peace Air Shed Zone Association will create and implement a process that provides relevant, scientifically credible information to stakeholders who will use the information to ensure continuous improvement of regional air quality, protect environmental health, and influence policy.

PASZA was the fifth airshed management zone formed in the province and is a non-profit organization incorporated under the Societies Act. PASZA operates under guidelines put forth in the Clean Air

Strategic Alliance's (CASA) Zone Air Quality Management Guidelines, including management by consensus, representation from affected stakeholders and public accessibility to data and information from its monitoring activities. Air Quality Management Zones are a key component in CASA's strategy for the management of air quality within Alberta.

The Peace Airshed Zone covers a 38,500 square kilometer area of northwestern Alberta, stretching from the Peace River south to the top of Township 64 and includes the area's two major population centres, Grande Prairie and High Prairie (see Figure 1). Approximately 85,000 people live and work in this area. The zone's major industries are oil and gas processing, forestry, agriculture and tourism.

Funding of PASZA is proportioned fairly amongst its members at levels consistent with their relative impact on the zone's air quality as determined by annual emission inventories. In 2003, PASZA members' financial and in-kind contributions totaled approximately \$283,000 and 1800 hours respectively.



Map Of PASZA Zone

2.0 The Year In Review

In March PASZA achieved a significant milestone with its formal endorsement by the Clean Air Strategic Alliance's Board of Directors acknowledging the association's commitment to the principles of inclusion, consensus decision-making, and public accessibility to data and information.

On May 29, long-time area Environmentalist and Board Member, Henry Pirker died of cancer. Henry made important contributions to PASZA and other organizations with the common goal of improving air quality and will be greatly missed.

In June, an application was made by PASZA on behalf of seventeen member facilities that would see portions of their compliance air quality monitoring programs superseded by participation and support of

the PASZA Program. The application was accepted and at year end, drafts of the facilities' amended approvals had been received from Alberta Environment and were being reviewed.

The month of August marked another milestone, the first anniversary of the start-up of the passive monitoring network component of the PASZA Regional Air Quality Monitoring Program. Data from the network is providing valuable information about the region's air quality and its long-term trends.

Start-up of the program's first continuous station, the Henry Pirker Air Quality Monitoring Station, originally scheduled for September was delayed due to problems in securing a suitable site. The station is scheduled for startup in early 2004.

3.0 Report from the Chair

The year 2003 as Chairman of the PASZA Board of Directors has again been a rewarding one. It has been a pleasure working with such a dedicated group of people and I am thankful for the work of the technical committee and our contractors as well as the help I have received from other PASZA members. We are all greatly saddened by the passing of board member Henry Pirker, who has made an important contribution to our organization in its formative years.

This has been a year of transitions. In 2002 we had been striving to get our air monitoring program up and running. We have now completed our first full year of operation of the passive air monitoring program and have begun laying the groundwork for the continuous portion of the program with the startup of the Henry Pirker Air Quality Monitoring Station in Grande Prairie scheduled in early 2004.

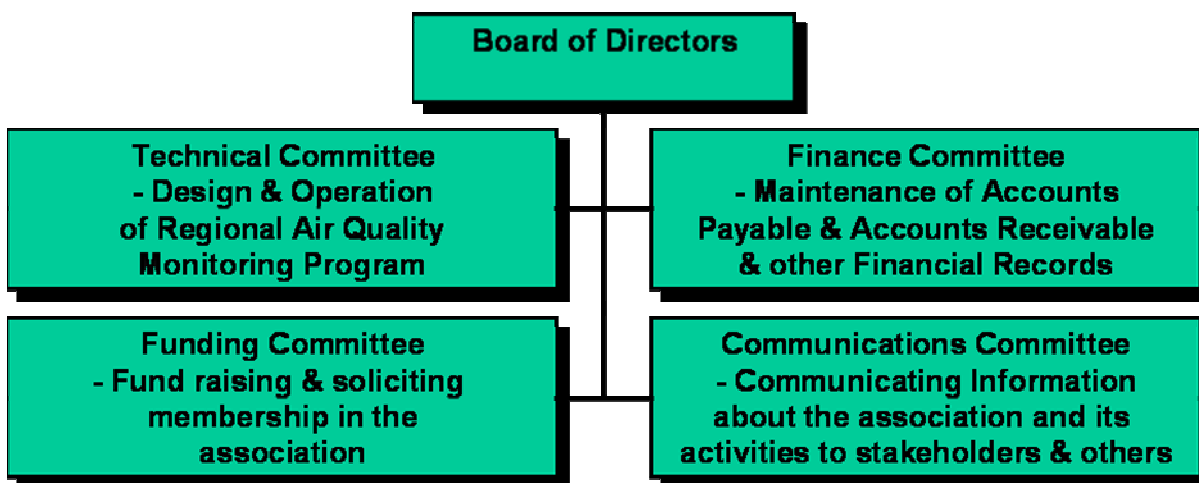
It has been very encouraging to witness the strong support and patience of industry and local governments that are supporting our program financially through a process which has taken longer than originally anticipated. I wish to thank all the membership for their contributions and support for PASZA. It has taken a great deal of effort but we are now seeing the results of those efforts and I am confident that PASZA will have great success in the future .

Richard Harpe
Chairperson



PASZA Chairperson - Richard Harpe

4.0 Organization



5.0 PASZA Regional Air Quality Monitoring Program

The first step in the process of developing, implementing and evaluating strategies to address the zone's air quality issues is the collection of data by a comprehensive Regional Air Quality Monitoring (AQM) Program in order to better understand the air quality within the zone's boundaries. Informed decision-making concerning air quality issues requires information that has been derived from data that are complete, comprehensive and scientifically credible.

For 2003, The PASZA Regional AQM Program consisted of its Passive Monitoring component only. The Continuous AQM Station originally scheduled for installation in Grande Prairie in the fall was not operational in 2003. The station and its associated monitoring equipment were procured and integrated, however, difficulties in securing a suitable location meant that the monitoring site was not ready until early 2004.

Discussions on the design of the continuous monitoring component of the program that began in the fall of 2002 continued throughout 2003. Data collected by the Passive Monitoring Network is providing information that is being used in the design of various components of the continuous program, especially siting. In designing the continuous program, the PASZA Technical Committee is reviewing the Alberta Ambient Air Quality Monitoring System (AAAQMS) and other zonal monitoring programs within Alberta, and adopting elements of those programs it feels will best serve the PASZA stakeholders' needs in a cost-effective manner.

The PASZA AQM Program uses passive monitors as a cost-effective method of collecting air quality data throughout the large geographic area that comprises the zone. The resulting database is suitable for; (1) assessing the spatial variation of the monitored parameters throughout the zone, (2) qualifying this data in relation to Alberta's air quality guidelines, and (3) identifying long term air quality trends, a typical approach in making regional-scale air quality assessments.

The advantages of passive sampling devices are their simple design, low cost and ease of use. No power is required to operate them, making them suitable for remote use; the only major restriction in locating samplers is the ability to access the sampler. The disadvantage of passive sampling devices is that typically the samples are collected over a one-month time period and short-duration events are averaged out.

Passive sampling devices rely on the principles of permeation and diffusion to physically uptake the specific compound being sampled. Air pollutants diffuse through a semi-permeable membrane and collect on a filter that has been chemically treated to absorb the parameter of interest. After being exposed in the field for approximately one month, the sampler is analyzed in a laboratory for the amount of the parameter collected. Using this value, an average concentration is calculated based on the duration of exposure and accounting for the effects of temperature, humidity, and wind speed.

5.0 PASZA Regional Air Quality Monitoring Program

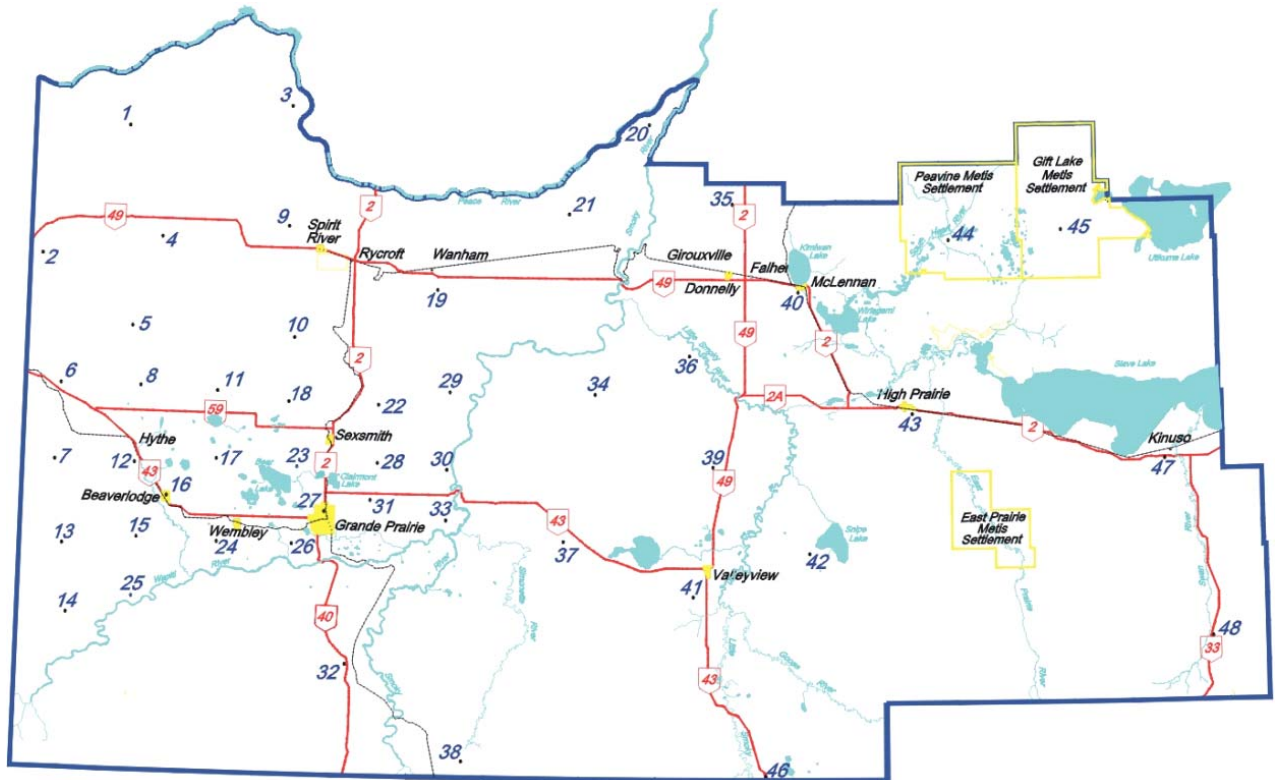
The parameters monitored passively in the zone include Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), and Ozone (O₃). These parameters are all associated with the priority air quality concerns of the zone's stakeholders and are also consistent with those being monitored passively within other Alberta Airsheds.

The passive monitoring stations are located throughout the zone generally on a 2 X 2 township (19 X 19 km) grid within the County of Grande Prairie and on a 3 X 3 township (29 X 29 km) grid throughout the rest of the zone except where limited by access. In June, after a review of data collected by the network from August 2002-April 2003 indicated that results at six stations were redundant with that collected at nearby stations, the network was reduced from 49 to 43 stations. Stations 6, 8, 13, 15, 22 and 31 were decommissioned and removed from service.

With sixteen months of passive data in hand, it is now possible to begin undertaking a more comprehensive assessment of the data to determine what the results indicate about the region's air quality including seasonal and longer-term trends. An initial assessment of these results are presented on the following pages.



PASZA Site 35 (Jean Cote) Passive Monitoring Station



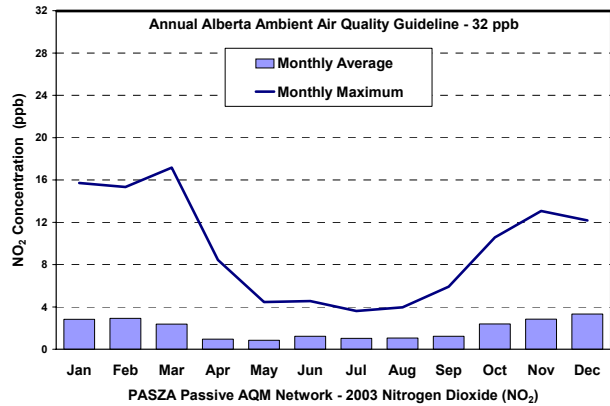
Location of the PASZA Passive Monitoring Stations for 2003

5.1 Nitrogen Dioxide

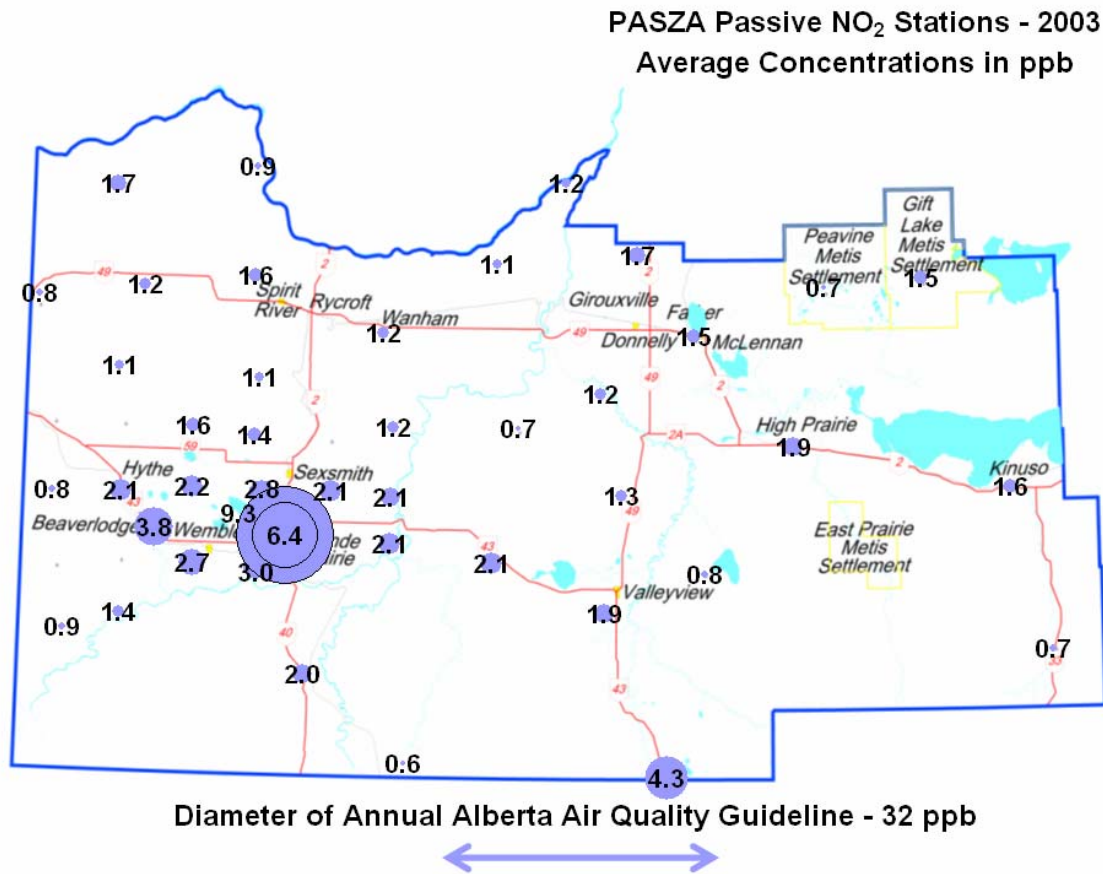
The average Nitrogen Dioxide (NO₂) concentration for the entire passive monitoring network for 2003 was 1.9 ppb. This level is significantly below the Alberta Air Quality Annual Average Guideline of 32 ppb which is based on the prevention of human health effects.

In general, NO₂ levels were higher in or around larger population centers and near major highways. This trend was expected and is consistent with the effect of NO_x emissions from motor vehicle traffic. Site 27 (Grande Prairie Industrial) again had the highest annual average concentration, measuring 9.3 ppb. The site with the lowest annual average concentration was again Site 38 (Karr Creek) measuring 0.6 ppb. This site is located along the zone's southern boundary in a location far away from any major population centre or highway.

The highest monthly average for the passive NO₂ network was observed during December which, for 2003, was the coldest month of the year, and a time



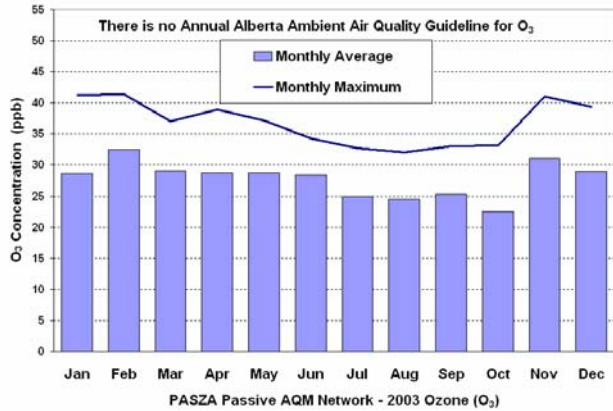
when the amount of thermally-induced mixing of the atmosphere would be at a minimum. The lowest monthly average was observed in May when there would have been much higher dispersion of NO₂ emissions due to the greater amount of thermal mixing brought about by higher solar radiation levels.



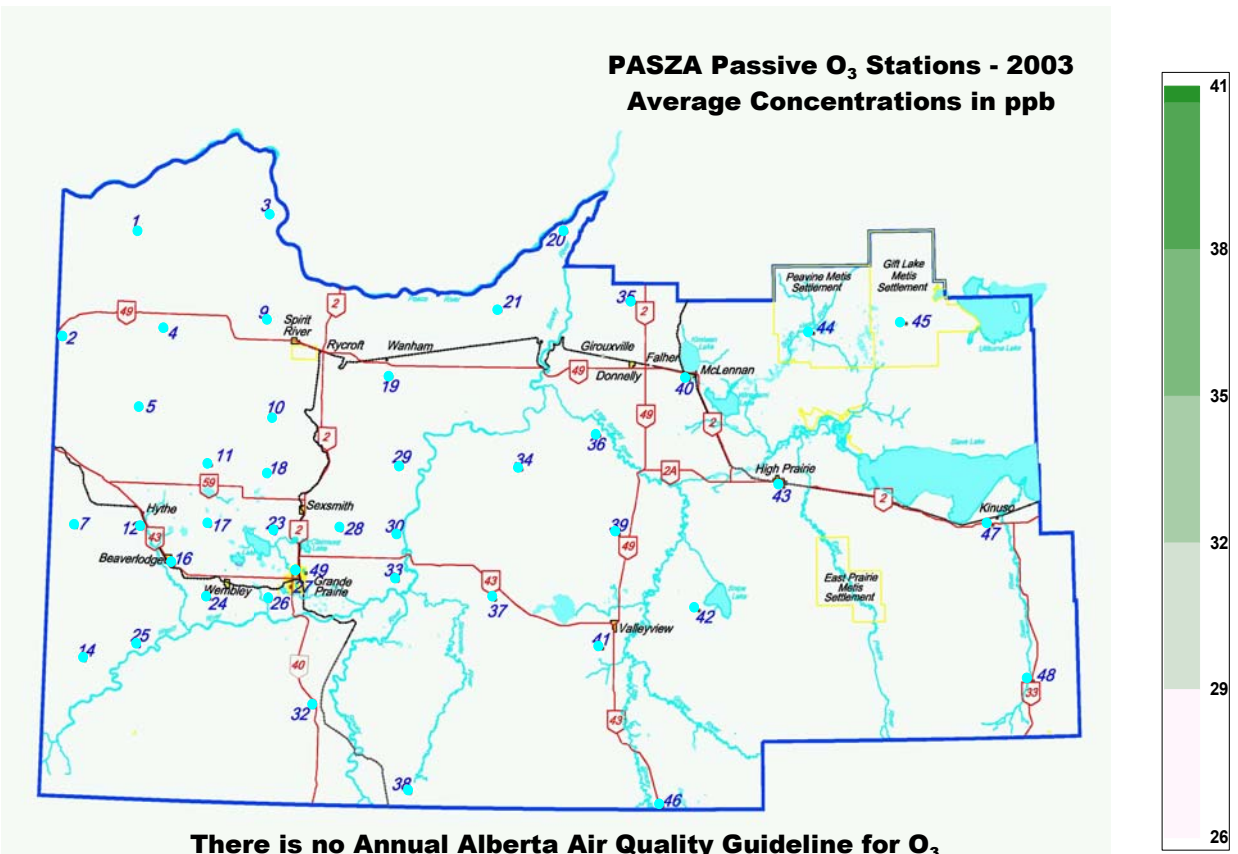
5.2 Ozone

The average Ozone (O₃) concentration for the entire passive monitoring network during 2003 was 27.8 ppb. There is no Alberta Air Quality Annual Average Guideline for Ozone. There is currently only an hourly average guideline (82 ppb) and it is based on the prevention of adverse effects to human health and vegetation.

In general, O₃ levels were relatively homogenous throughout the rural areas of the zone and significantly lower in or around larger population centers and near major highways. The lower levels at these sites are consistent with the reaction of ozone with NO_x emissions from motor vehicle traffic. Site 3 (Forth Creek) had the highest average concentration, measuring 33.1 ppb. This site is located close to the zone's northern boundary and potentially upwind of most of the region's emission sources that could contribute to any anthropogenic ozone formation. The site with the lowest average concentration was Site 32 (Gold Creek) measuring 22.7 ppb. This site is located near the zone's southern boundary in a location downwind of Grande Prairie in the vicinity of a major highway, Highway 40.



In general, observed ambient O₃ concentrations observed in or downwind of the more populated regions of the zone indicated seasonal variations typical of anthropogenic ozone formation, with the highest values observed in the late spring. Concentrations observed in the less-populated areas indicated levels and seasonal variations that may be more attributable to naturally-occurring meteorological phenomena.

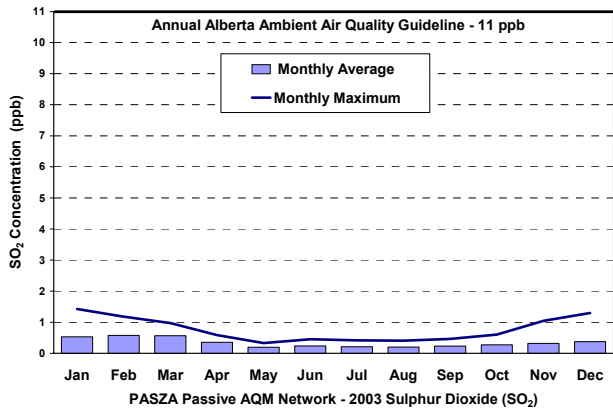


5.3 Sulphur Dioxide

The average Sulphur Dioxide (SO₂) concentration for the entire passive monitoring network for 2003 was 0.3 ppb. This level is significantly below the Alberta Air Quality Annual Average Guideline of 11 ppb which is based on the prevention of effects to vegetation.

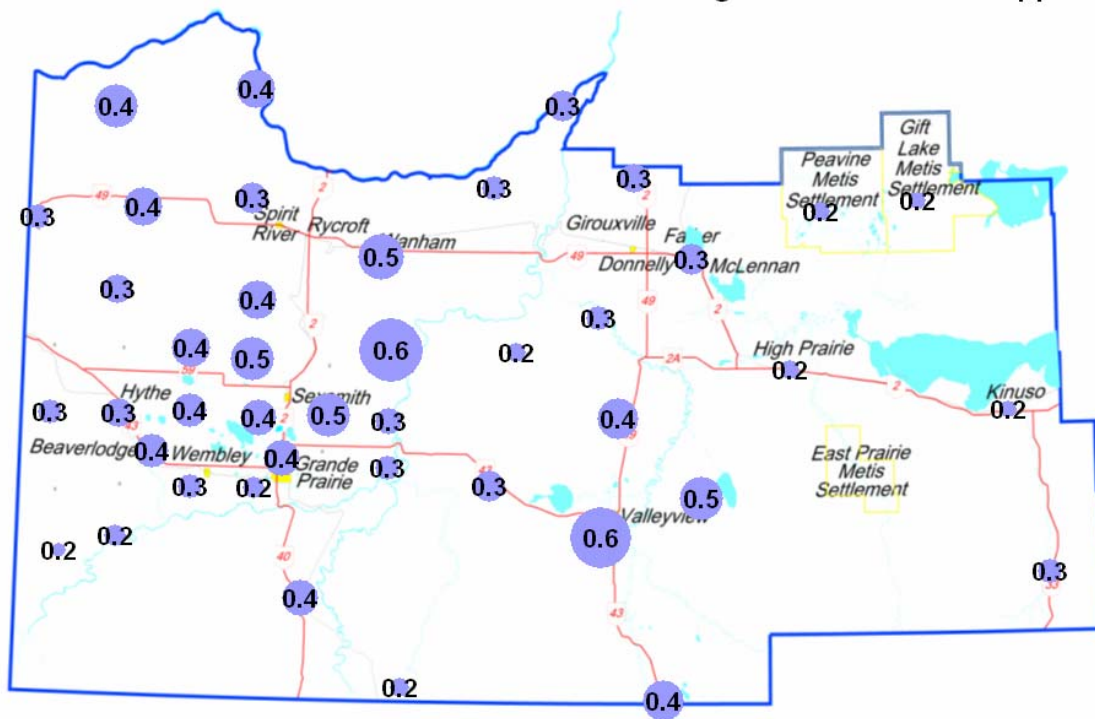
In general, SO₂ levels were higher in or near areas with sour gas or pulp and paper production facilities as was the case for Site 29 (Smoky Heights) which again had the highest annual average concentration for the period, measuring 0.65 ppb. This trend was expected and is consistent with that observed in other Alberta Airsheds. The site with the lowest annual average concentration was again Site 14 (Sylvester) measuring 0.16 ppb. This site is located close to the zone's southwestern boundary in a location upwind of sour gas or pulp and paper production facilities.

Ambient SO₂ concentrations observed throughout the Zone displayed predictable seasonal variations simi-



lar to the NO₂ results and for the same reasons. The highest monthly average for the passive SO₂ network was observed during January, one of the coldest months of the year while the lowest monthly average was observed in May, the same month as the minimum monthly average NO₂ concentration.

**PASZA Passive SO₂ Stations - 2003
Average Concentrations in ppb**



Diameter of Annual Alberta Air Quality Guideline - 11 ppb

6.0 Financial Report

Peace Airshed Zone Association
Financial Report* for the Year Ended December 31, 2003

		<u>2003</u>		<u>2002</u>
Revenue:	Contributions	\$ 283,270		\$ 150,064
	Interest Income	9		4
		<u>283,279</u>		<u>150,068</u>
Expenses:	Advertising & Promotion	2,368		-
	Bank Charges and Interest	151		16
	Contracted Administration	85,200		-
	Equipment Lease	12,244		-
	Honoraria and Travel	262		-
	Insurance	1,216		-
	Monitoring Contracts	127,626		83,870
	Office	465		2,905
	Professional Fees	1,700		1,498
	Program Management Fees	27,579		27,270
	Website Development	-		13,824
	Sampler Costs	-		22,581
		<u>258,811</u>		<u>151,964</u>
Excess (Deficiency) of Revenues over Expenses		24,468		(1,896)
Unrestricted Net Assets, beginning of year		<u>(254)</u>		<u>1,642</u>
Unrestricted Net Assets (Deficit), end of year		\$ 24,214		\$ (254)
ASSETS				
CURRENT				
	Cash	\$ 90,515		\$ 41,972
	Accounts receivable	-		-
		<u>\$ 90,515</u>		<u>\$ 41,972</u>
LIABILITIES				
CURRENT				
	Accounts payable and accrued liabilities	\$ 66,301		\$ 42,226
MEMBER EQUITY				
NET ASSETS				
	Unrestricted net assets	<u>24,214</u>		<u>(254)</u>
		<u>\$ 90,515</u>		<u>\$ 41,972</u>

* A copy of the audited financial report is available from the PASZA Treasurer upon request.

7.0 Membership

7.1 Board of Directors

Richard Harpe	County of Grande Prairie	Chair
Jim Meagher	Peace County Health	Vice-Chair
Mike Weeks	Saddle Hills Awareness Committee	Vice-Chair
Bob Cameron	South Peace Environmental Association	
Bob Savage	Alberta Energy & Utilities Board	
Rod Burr	Alberta Environment	
Uli Wolf	Aquatera	
Doug Bagget	Ainsworth Lumber Co.	
Lori Pollock	Talisman Energy	Treasurer
Garth Gress	Suncor Energy Ltd.	
Roger Henault	EnCana	
John Croken	City of Grande Prairie	
Joyce Dvornek	MD of Big Lakes	
Milton Hommy	Public	
Teresa Von Tiesenhausen	Public	Secretary
Leon Pendleton	Public	

7.2 Technical Committee

Rod Burr	Alberta Environment	Government
Bob Savage	Alberta Energy & Utilities Board	Government
Tammy Kehl	EnCana	Industry
Gerald Feschuk	Focus	
Doug Bagget	Ainsworth Lumber Company	Industry
Marta Villamil	BP Canada Corporation	Industry
Mike Weeks	Saddle Hills Awareness Comm.	NGO
Robert Boyce	Devon Canada	Industry
Kevin Warren	Amarok Consulting	
Bob Cameron	South Peace Environmental Association	

7.3 Communications Committee

Jim Meagher	Peace Health Region	Government
Teresa Von Tiesenhausen		Public
Gerald Feschuk	Focus	

7.4 Financial Committee

Lori Pollock	Talisman Energy	Industry
Garth Gress	Suncor Energy Ltd.	Industry

7.5 Funding Members

Acclaim Energy Inc.	County of Grande Prairie #1	Peace Health Region
Ainsworth Lumber Company Ltd.	Devon Canada Corporation	PennWest Petroleum
Alliance Pipelines	Duke Energy Field Services Ltd.	PrimeWest Energy Ltd.
American Leduc Petroleums	Encana Corporation	Prince Resources Corporation
Anadarko Canada Corporation	Enerplus Group	Shiningbank Energy
ARC Resources Ltd.	Fortune Energy	Signalta ResourcesLtd.
ATCO Power	Grey Wolf Exploration Ltd.	Star Oil and Gas Ltd.
Birch Hills County	Hunt Oil Company of Canada Inc.	Suncor Energy
Bonavista Petroleum Ltd.	Husky Oil Ltd.	Talisman Energy Canada
BP Canada Energy Company	Impact Energy Inc.	Tolko Industries Ltd.
Burlington Resources Canada Ltd.	MD Big Lakes	Town of Beaverlodge
Canadian Natural Resources Ltd.	MD of Greenview	Town of Hythe
CAN-FOR Products	MD of Greenview #16	Town of Spirit River
Capture Energy Ltd.	MD of Smoky River	Valleyview
Chariot Energy Inc.	MD of Spirit River	Vintage Petroleum
City of Grande Prairie	Northrock Resources	Weyerhaeuser Canada
ConocoPhillips Canada Energy	Paramount Resources Ltd.	

Acknowledgements

The Peace Airshed Zone Association would like to acknowledge the hard work and contributions of all stakeholders of the association. With a lot of hard work, we have made significant strides in 2003 towards achieving our vision. Our member companies and municipalities have continued to provide experience and financial stability to PASZA. Members from the public, health, environment, and municipal sectors have contributed to ensuring accountability, sustainability, and transparency of the association.

Amarok Consulting has continued to provide leadership in the technical management of the air quality monitoring program and many other areas as well. The Focus Corporation has provided exemplary service to PASZA in the administrative management of the program, and in establishing, operating and maintaining the passive monitoring network.

Thanks are due to the CASA Secretariat, who through the early years of PASZA's existence have provided a substantial amount of support and resources enabling us to build a strong and sustainable foundation. Special thanks are also due to past members of the association who made significant contributions of their time and spirit and have been valuable resources for PASZA during its formative years.

Glossary

Nitrogen Dioxide (NO₂): A reddish-brown gas, nitrogen dioxide is the most abundant of the oxides of nitrogen (NO_x) found in the atmosphere. Nitrogen oxides are typically created during combustion processes when nitrogen combines with oxygen. Other sources are the natural degradation of vegetation and the use of chemical fertilizers. NO₂ is a major contributor to smog formation and acid deposition and at higher concentrations is associated with numerous adverse health effects.

Ozone (O₃): A strong smelling, pale blue, reactive toxic chemical gas consisting of three oxygen atoms. It is a product of the photochemical process involving the sun's energy and ozone precursors, such as hydrocarbons and oxides of nitrogen. Ozone exists in the upper atmosphere ozone layer (stratospheric ozone) as well as at the Earth's surface in the troposphere (ozone). Ozone in the troposphere is associated with numerous adverse health effects. It is a major component of smog.

Sulphur Dioxide (SO₂): A strong smelling, colorless gas that is formed by the combustion of fossil fuels. Sour gas processing plants, oil sands processing plants and coal-fired power generating plants are major sources of SO₂. SO₂ and other sulfur oxides contribute to the problem of acid deposition.

ppb: parts per billion by volume

ppm: parts per million by volume