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ANMF (Vic Branch) Submission to the National Environment Protection (Ambient Air Quality) Measure:

**Proposed variation to
Sulphur dioxide,
Nitrogen dioxide and
Ozone standards and
response to the impact
statement**

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Introduction

ANMF (Vic Branch) welcomes the opportunity to provide a submission to the review of the standards for sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and ozone (O₃) standards in the National Environment Protection (NEPM) (Ambient Air Quality) Measure.

Given the standards have not been revised since their introduction in 1998, this revision provides opportunity to embed strong mechanisms to reduce Victoria's air pollution, move toward zero-emission targets and improve health outcomes.

ANMF (Vic Branch) has a membership of over 86,000 nurses, midwives and personal care workers (however titled and working predominantly in the private residential aged care sector). Our members are employed in a range of health services and clinical specialties including hospitals, aged care, community health, mental health, alcohol and other drug services, maternal and child health, medical clinics, prisons and the Australian Red Cross Blood Service.

The ANMF (Vic Branch) actively promotes action on climate change, environmental sustainability, health and wellbeing. Nurses and midwives see daily the ways in which everyone's health is inextricably linked to the health of the environment in which we live. The negative health impacts of climate change and environmental degradation affect the key social determinants of health and damage social and community structures. These negative health impacts in turn increase pressure on already overloaded health services. Air pollution poses a fundamental risk to the health of our organs and our wellbeing, our hospitals, and our economy. In short, the often unseen threat of air pollution impacts us all.

In response to a delegates' resolution, passed at the 2012 Delegates Conference, which requested that ANMF (Vic Branch) become more involved in policy debate on climate change and environmental issues, ANMF launched the Health and Environmental Sustainability Conference in 2013. This is now an annual conference which covers a range of issues related to the links between health and the environment. We run social networking for staff involved in sustainability initiatives and have "Nursing for the Environment" an education and training course included in member CPD offerings. In addition, ANMF (Vic Branch) has become more involved in policy debate on climate change and health and environment issues at the state level.

ANMF (Vic Branch) acknowledges the assignation of numerical values to the standards in the AAQ NEPM however we also wish to express some fundamentally simple human and health-oriented principles underpinning and superseding the numbers.

- The cleaner the air the better. There is no safe lower limit and no safe level of exposure.
- Air pollution is both deadly and substantially anthropogenic.
- What we can improve we should improve.
- Actions taken to reduce air pollution should not be reduced to cost effective calculation.
- Air quality standards should protect people wherever they live.
- Government has a responsibility to protect citizens, including air quality and safety.
- Where evidence base is not established, the precautionary principle applies.
- The goal is always best practice.
- The other goal is zero emissions.

The importance and the problem

Clean air, water and land are essential to life, our health and well-being, yet data from the Australian Institute of Health and Welfare informs us that annually in Australia, air pollution contributes to the death of over 3000 people¹ – avoidable premature loss.

Globally the World Health Organisation has declared air pollution to be the world's largest environmental health risk² and a public health emergency³ - a deadly problem, responsible for the early deaths of some seven million people every year. The quality of our air is not something we can take for granted when it is estimated that 90 per cent of the world's population breathe polluted air.⁴

Ahead of the air pollution themed 2019 World Environment Day, David Boyd, UN Special Rapporteur on human rights and the environment, said that the failure of governments across the world to ensure clear air, constitutes a "violation of the rights to life, health and well-being, as well as the right to live in a healthy environment."⁵ Meeting the goals of the Paris Agreement to combat climate change could save about a million lives a year worldwide by 2050 through reductions in air pollution alone.⁶

Australian air pollution standards have been described as lagging significantly behind other countries including the US, EU and China⁷. At levels currently experienced in Australian cities, there are strong associations between exposure to NO₂, O₃, and SO₂ and increases in daily mortality and hospital admissions for respiratory and cardiovascular causes.⁸ The National Environment Protection Council (NEPC) 2011 review concluded that the health effects currently being experienced in the Australian population at levels below the current standards imply that the desired environmental outcome of the AAQ NEPM is not being met.⁹

¹ <https://www.smh.com.au/environment/3000-deaths-caused-by-air-pollution-each-year-prompt-calls-for-tougher-standards-20151113-gkygv1.html>

² <https://www.theguardian.com/environment/2014/mar/25/air-pollution-single-biggest-environmental-health-risk-who>

³ <https://www.who.int/air-pollution/news-and-events/how-air-pollution-is-destroying-our-health>

⁴ <https://news.un.org/en/story/2019/06/1039661>

⁵ <https://news.un.org/en/story/2019/06/1039661>

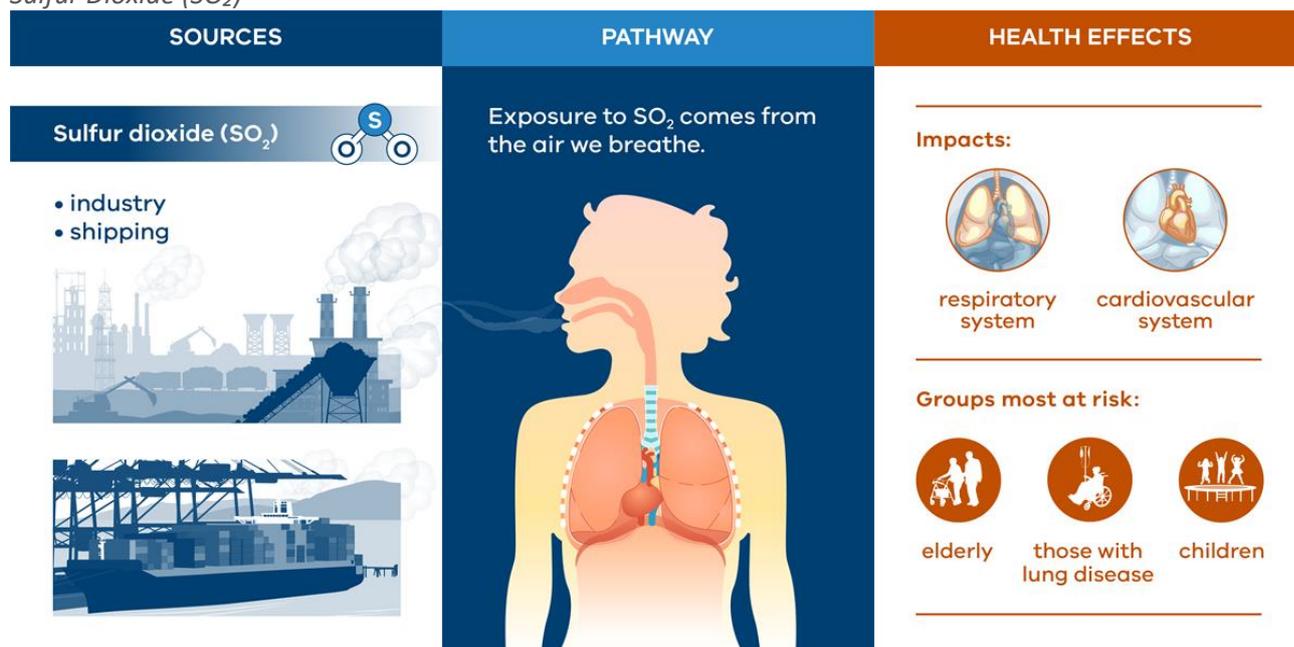
⁶ <https://www.who.int/air-pollution/news-and-events/how-air-pollution-is-destroying-our-health>

⁷ EJA NEPM Variation Submission Guide 2019, <https://www.sbs.com.au/news/dateline/australia-needs-strict-rules-to-curb-air-pollution-but-there-s-a-lot-we-could-all-do-now>

⁸ Impact statement for the review of the ambient air quality NEPM standards for SO₂, NO₂ and O₃. [impact statement](#) from the NEPC

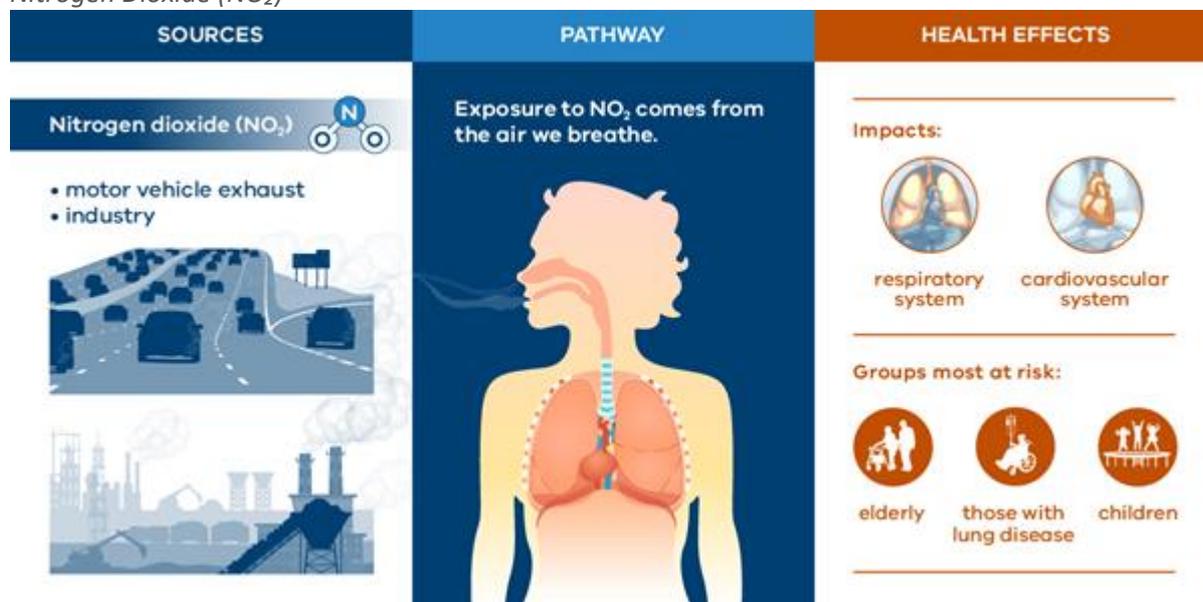
⁹ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 3.4.1, p.25

Sulfur Dioxide (SO₂)



Fossil fuels contain traces of sulphur compounds, producing sulphur dioxide when they are burnt. The majority of the sulphur dioxide emissions come from coal-fired power generation. Exposure to sulphur dioxide can damage the lungs. People with impaired heart or lung function including asthma are at increased risk. Sulphur dioxide is involved in the creation of acid rain and secondary fine particle air pollution which causes cardiovascular and respiratory diseases, including cancer.¹¹

Nitrogen Dioxide (NO₂)

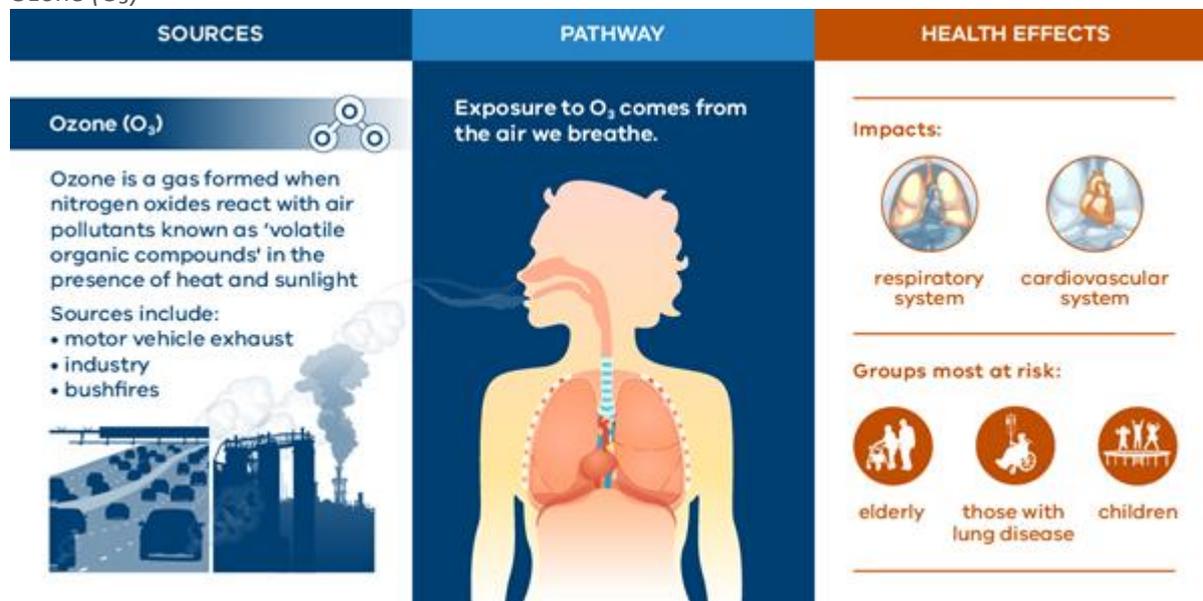


¹⁰ Diagrams from EPA Victoria, Review of National Ambient Air Quality Standards¹⁰ and descriptions from [Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulfur dioxide and ozone in ambient air.](#)

¹¹ [United States Environmental Protection Agency; Sulfur Dioxide Pollution. https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects](https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects)

Nitrogen dioxide is formed from high temperature combustion, such as emissions from vehicles, coal-fired power stations and industrial processes. Nitrogen dioxide can irritate eyes, nose, throat and lungs, causes coughing and shortness of breath. Higher exposure can cause illness and disease, impacting a wide range of organs including the lungs, heart and circulatory system. There is strong evidence for adverse effects in vulnerable groups including people with chronic disease, the elderly and children.¹²

Ozone (O₃)



Ozone is a gas that is formed on hot sunny days when oxides of nitrogen react with organic substances in the air. Motor vehicle exhaust fumes produce as much as 70% of the oxides of nitrogen and 50% of the organic chemicals that form ozone. Ozone can impact the airways and lungs. People who are exposed to ozone can experience difficulty in breathing and coughing. Ozone can increase susceptibility to lung infections and aggravate lung diseases such as asthma, chronic obstructive pulmonary disease, and chronic bronchitis. People with asthma might have more attacks and athletes might find it harder to perform as well as usual.¹³

This ought to be considered in context, given that Australia has one of the highest rates of asthma in the world, especially in children. In the Australian population as a whole, 11 per cent (or 2.5 million people) had doctor-diagnosed asthma in 2014–2015. In children <15 years of age the rate increased to 18 per cent.¹⁴ These figures show there is a large group of people within the population who are vulnerable to the effects of the pollutants under consideration in this submission. This includes “hotspots” currently omitted from NEPC monitoring.

“The risks from air pollution are now far greater than previously thought or understood, particularly for heart disease and stroke,” says Dr Maria Neira, Director of WHO’s Department for Public Health, Environmental and Social Determinants of Health. “Few risks have a greater impact on global health

¹² United States Environmental Protection Agency; Nitrogen Dioxide Pollution. <https://www.epa.gov/no2-pollution/basic-information-about-no2>

¹³ United States Environmental Protection Agency; Ozone Pollution. <https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution>

¹⁴ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 3.2, p.24

today than air pollution; the evidence signals the need for concerted action to clean up the air we all breathe.”¹⁵

While air pollution affects everyone, not all are equal. Groups with added vulnerability to the health effects of air pollutants include:

- children
- pregnant women
- elderly people
- asthmatics and people with chronic disease (especially heart and lung diseases)
- low socio-economic groups

Those most at risk from the health impacts of air pollution are those who live near heavily used road and rail transport corridors, people exposed to wood smoke from home fires, and people who live near industrial pollution sources such as coal mines, coal-fired power stations and smelters.¹⁶

Air pollution continues to take a toll on the health of the most vulnerable populations – women, children and the older adults," states WHO's Dr Tedros Adhanom. "For people to be healthy, they must breathe clean air from their first breath to their last.”¹⁷

As well as affecting our health, pollutants in the air are also causing long-term environmental damage by driving climate change and its effects, itself a major threat to health and well-being.¹⁸

Other costs

The federal government says the health effects arising from exposure to current concentrations of ozone, NO₂ and SO₂ in urban areas alone totalled between \$562 million and \$2.4 billion between 2010 to 2014. A Victorian analysis has estimated health costs of air pollution from the state's electricity sector alone totalled \$600 million in 2018.¹⁹

“The true cost of climate change is felt in our hospitals and in our lungs. The health burden of polluting energy sources is now so high, that moving to cleaner and more sustainable choices for energy supply, transport and food systems effectively pays for itself,” says Dr Maria Neira, WHO Director of Public Health, Environmental and Social Determinants of Health.

Setting the Standards

ANMF (Vic Branch) believes that continued government involvement is required to address the current and potential future health impacts and costs of SO₂, NO₂ and O₃. As outlined above, exposure to unsafe levels has significant adverse impacts and cannot be left to industry self-regulation and commercial motivation. This would represent a “retrograde step in air quality management in Australia.”²⁰

¹⁵ <https://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>

¹⁶ Australian Medical Association, Submission no 114 to Senate Community Affairs References Committee, Parliament of Australia, *Impacts on Health of Air Quality in Australia*, 2013, as cited by EJA, “Clearing the air - Why Australia urgently needs effective national pollution laws” 2014, p.8

p6.

¹⁷ <https://www.who.int/news-room/detail/27-09-2016-who-releases-country-estimates-on-air-pollution-exposure-and-health-impact>

¹⁸ <https://www.who.int/air-pollution/news-and-events/how-air-pollution-is-destroying-our-health>

¹⁹ https://www.footprintnews.com.au/nl06_news_selected.php?selkey=55732

²⁰ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 3.4.3, p.26

Given the overwhelming importance of clean air to health, it is essential that the voice of health experts takes precedence over industry. Strong health-based standards are required now to minimise ongoing damage to the health of Australians. This is reflected in the position taken in ANMF (Vic Branch) recommendations.

At the same time, we recognise “there is no evidence from epidemiological studies conducted in Australia and overseas that there is a threshold below which adverse health effects are not observed. This means that any increase in population exposure to these pollutants will lead to an increase in risk to the health of the population.”²¹

Recommendation 1

Lower the standards for nitrogen dioxide, sulphur dioxide, and ozone to reflect best international practice in accordance with the recommendations of the Expert Health Panel position paper.

An Expert Health Panel, including representatives from the Lung Health Research Centre at the University of Melbourne, has developed a position statement and table to ensure the latest health research and analysis informs new standards. ANMF (Vic Branch) recognises the expertise of this panel and therefore the panel’s recommendations for Australian regulated thresholds of nitrogen dioxide, sulphur dioxide and ozone in ambient air. These recommended standards, derived from the position paper, are included in appendix one.

Recommendation 2

Improve and expand the NEPM AAQ and network of NEPM compliance monitors:

- To reflect risks from widespread source emissions and hotspots, such as traffic on major roadways.
- To include small population centres and monitoring in communities at risk of air pollution.

Currently the air quality standards are designed for locations that are generally representative of the level of exposure of the broad population and the exposure of people who live near major sources of pollution is not assessed through air quality motion.²² This is in contradiction of the objective of the NEPM to “minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live.” Currently air pollution only needs to be monitored for population centres with more than 25,000 people.²³ Some populations live very close to the pollution source so have a much higher exposure. All Australians are entitled to “equivalent” protection under the NEPM.

Recommendation 3

Air quality monitoring data should be made publicly available through a coordinated national website, allowing access to real-time and historical data. This should include: records from daily monitoring of key pollutants, health alerts for the general public and at-risk population sub-groups, and regular modelling of dispersal from all major point sources, such as coal-fired power stations and major roadways. This is critical to provide individuals and communities with information about the quality of the air they are breathing.

²¹ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 3.2.2, p.23

²² Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, p.15

²³ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 1.3, p.2

Recommendation 4

Air quality standards should encompass accountability beyond reporting and include compliance obligations and enforcement mechanisms.

Under the NEPC Act, accountability for meeting the standards lies in the public reporting; there are no penalties associated with non-compliance. Jurisdictions are only required to evaluate their performance at each monitoring station against the AAQ NEPM standards and goals and to report the results to the NEPC each year.²⁴ It is not directly enforceable on industry.

A strong and proactive approach to air pollution prevention requires robust and well-resourced institutional arrangements capable of decisive policy intervention. This includes incentives and penalties that create sufficient deterrence to prevent non-compliance. This is a critical measure to ensure appropriate governance and protections for the community, as well as a pathway for recourse for action when non-compliant activities cause adverse health outcomes.

Recommendation 5

Strong health-based standards should be set now to protect health, with an exposure reduction framework²⁵ in place for continual improvement of the standard. This will ensure there is a target to “minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live”. There are currently no targets for exposure – reduction for SO₂, NO₂ and O₃ in the AAQ NEPM such as has been introduced in the EU.²⁶

“The desired environmental outcome should reflect the desire to continuously improve air quality to minimise risk to the health of the Australian population. An exposure-reduction approach in the AAQ NEPM which drives continuous improvement will complement health-based standards that provide equitable protection for all to reduce health impacts from these pollutants now and in the future.”²⁷

An exposure reduction framework is required for continually improving the standards as new human and environmental health data becomes available.

²⁴ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, p.15

²⁵ An exposure-reduction framework is designed for use, in addition to standards, to reduce population exposure to a pollutant. Exposure-reduction frameworks are used in some jurisdictions to account for the fact that some pollutants have no threshold for health effects, and any reduction in concentrations will lead to a health benefit. These frameworks enable continuous improvement in air quality, and lead to reductions in population exposure irrespective of whether the standards are met or not. The concept of an exposure-reduction framework is consistent with the requirements of the NEPC Act to provide equivalent protection to all Australians wherever they live - Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 1.5.2, p.3

²⁶ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 2.2.3, p.14

²⁷ Impact Statement for the Review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃, 5.2, p. 41

APPENDIX ONE

The 'Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulphur dioxide and ozone in ambient air' was coordinated by Clare Walter (Lung Health Research Centre) and Maxwell Smith (Environmental Justice Australia) in consultation with Ben Ewald, Eugenie Kayak and Ken Winkel (Doctors for the Environment Australia), Ekta Sharma and Paula Myott (Royal Australasian College of Physicians), Kelcie Herrmann and Judy Powell (Lung Foundation of Australia), Elena Schneider-Futschik (Lung Health Research Centre), Fiona Armstrong (Climate and Health Alliance), Robyn Schofield (Melbourne Energy Institute, Clean Air and Urban Landscapes Hub, University of Melbourne), Annabelle Workman (Melbourne Sustainable Society Institute), Prof Louis Irving (Royal Melbourne Hospital and the Peter MacCullum Cancer Centre), and Prof Gary Anderson (Lung Health Research Centre).

| Table key: | |
|-------------------|--|
| Ppb | Parts per billion |
| RIS | Regulatory Impact Statement |
| 99th centile | The value in a data set that is exceeded by 1% of data points |
| WHO | World Health Organisation |
| Yearly worst hour | The highest value of the 8,760 1-hour values in a year. The 99th centile of hourly values potentially allows for 87 bad air days per year. |
| Daily worst hour | The 365 values for daily 1-hour maximum. The 99 th centile of daily worst hour permits 4 bad air days per year. |

| Standard (All units in ppb) | International standards | Current Australian standard | NEPM RIS proposal | Expert health panel proposal |
|-------------------------------|--|---|---|---|
| SO₂ 1-hour | US: 75, as 99th centile of daily worst hour Canada: 70, as 99th centile of daily worst hour EU: 124 | 200, as yearly worst hour, not to be exceeded | 100, as yearly worst hour, not to be exceeded | 60, as 99th centile of daily worst hour |
| SO₂ 24-hour | WHO: 7.6 EU: 44 UK: 44 | 80 | 20, no exceedances | 8, no exceedances |

| Standard (All units in ppb) | International standards | Current Australian standard | NEPM RIS proposal | Expert health panel proposal |
|--|--|---|-----------------------------|--|
| SO₂ annual | Canada: 5 No standard in other jurisdictions | 20 | No standard | No standard |
| NO₂ 1- hour | WHO: 97 US: 100, as 99th centile of daily worst hour EU: 97 | 120, as yearly worst hour, not to be exceeded | 90, as yearly worst hour | 72, as 99th centile of daily worst hour |
| NO₂ annual | WHO: 19 US: 53 EU: 19 | 30 | 19, no exceedances | 9, no exceedances |
| O₃ 1-hour | NZ: 70 Japan: 60 | 100 | No standard | 70 |
| O₃ 4-hour | No standard in other jurisdictions | 80 | No standard | No standard |
| O₃ 8-hour | WHO: 47 US: 70, as 99th centile of daily worst hour Canada: 63 EU: 56 | No standard | 65 | 47 |