

Appendix 6: Environmental Impact Review

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Pollutant	Description	Reference
Particulate matter (PM)	<p>Particles small enough to enter into the lungs when inhaled and may be comprised of various solids or liquids. PM2.5 (particles less than 2.5 microns in size) may enter deep into the lungs and may be absorbed into the blood stream. Multiple studies have indicated that there is a significant increase in both PM2.5 and PM10 levels associated with the use of fireworks.</p> <p>“A large body of research suggests that outdoor ambient PM levels increase significantly during FW/FC displays. Furthermore, FW/FC PM remains suspended in the air, contributing to high PM concentrations for a long period.”</p> <p>Particulate matter does pose a risk to health though there is limited research identifying the direct impact of the use of fireworks. It can be concluded however that the use of these devices does not improve air quality. This is particularly problematic during periods of poor air quality, i.e. wildfire season, peak traffic conditions etc.</p>	1. 13.
Perchlorate	<p>Perchlorate is a chemical used in fireworks as well as road flares, explosives and rocket fuel as an oxidizer to assist with propulsion. It has been identified as an inhibitor to the uptake of iodine by the thyroid gland in humans. Various studies have indicated that peak levels of perchlorate have been identified around periods of fireworks use in bodies of water adjacent to the displays.</p> <p>Health Canada’s Food Directorate has measured the levels of perchlorate in a variety of food types including cow’s milk, baby formula and fruit, and determined that perchlorate remains at an acceptable level.</p>	2. 3. 4. 12.
Metals	<p>The vibrant colours associated with fireworks are created through the use of various chemicals including metal salts, containing lithium, sodium, copper, barium, calcium and strontium. When fireworks are detonated these metal salts do not burn up and are often aerosolized, distributed over a wide area, and may be inhaled or ingested.</p> <p>One study identified that a “disturbing amount” of lead was found in two of the products tested</p>	7. 13.
Ozone	<p>Research conducted around Diwali in 1999 indicates that there is an increase in ozone levels that may be linked to the use of sparklers that when burnt, emit light in a wavelength that enables a reaction that creates O3.</p> <p>“Scientists have studied the effects of ozone on health for decades. Hundreds of studies have confirmed that ozone harms people at levels currently found in the United States. In the last decade, we have learned that it can also be deadly.”</p>	5. 6.

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	(Staff were unable to access any relevant research identifying whether the ozone created by fireworks presents an immediate health threat)	
Noise	<p>There is significant anecdotal evidence that fireworks are disturbing to family pets, live stock and wild life. It is estimated that 50% of dogs are disturbed by the noise created by fireworks, likely due to canine's more sensitive hearing. The largest impact however may be on wild birds. The noise and light storm created by fireworks has long been associated with disturbance within the wild bird population. The worst case being the death of between 3 and 5000 blackbirds in Beebe Arkansas which was associated with News Years Eve Fireworks. There have also been other reports from Rome and Texas</p> <p>A more scientifically rigorous exploration of the impact of fireworks noise was published in 2022. "Wild goose chase: Geese flee high and far, and with aftereffects from New Year's fireworks" included the tracking of 327 wild migratory geese during eight new years eve events. The study demonstrated that fireworks :</p> <p><i>"are intensive disturbances lasting beyond the duration of the fireworks. The increased night movement of the geese during NY potentially depletes energy supplies that they need in order to survive the winter in W-Europe (Béchetet al., 2004), leading to two notable aftereffects: (1) longlasting increased foraging and (2) roost shifts."</i></p>	8. 9. 10. 11.

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