



Resource Management (National Environmental Standards for Air Quality) Regulations 2004 – Regulation 16A Exceptional Circumstances

APPLICATION FORM

Before completing this form please read section 3.8 of the [2011 User's Guide to the revised National Environmental Standards for Air Quality](#).

Need more help? If you have any questions email air@mfe.govt.nz.

Please send your completed application form and all attachments to air@mfe.govt.nz.

Alternatively, if attachments are too large to email, please post hard copies of the application form and all attachments, along with a CD containing all files, to:

Air Quality NES Exceptional Circumstances
Ministry for the Environment
PO Box 10362
Wellington 6143

1. Applicant details	
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2. Details of exceedance event	
Contaminant	24 Hour PM ₁₀
Date of exceedance <i>(must not be >3 months from date this application is received)</i>	23 October 2019
Relevant airshed	Auckland Urban Airshed

Monitoring station and technical specifications of monitor	Queen Street monitoring station T640 PM10/PM2.5/PM1.0 Optical – T640 Make TELEDYNE, Model T640, Number 85, Age 5 years			
Summary of monitoring reading showing exceedance event	Continuous PM ₁₀ monitoring data at the Queen Street site showed elevated levels from the early hours of 23 October through to about midday of the same day. This resulted in a PM ₁₀ 24 hour average of 99 µg m ⁻³ on 23 October, an exceedance of the national PM ₁₀ standard 50 µg m ⁻³ . See attached documentation 1 for details.			
Analysis of baseline data	An analysis of baseline data at the Queen Street station shows that PM ₁₀ levels met the national standard from 2014 to 2019, except for the exceedance on 23 October 2019. See attached documentation 3 for details.			
Source speciation or other analysis	See attached documentation 5.			
Explanation of any previous exceedance event/s from this monitoring station in the past 5 years	There was no exceedance event from this monitoring station in the past 5 years from 2014 to 2018. See attached documentation 3 for details.			
Monitoring readings covering exceedance event	√ Attached		<input type="checkbox"/> Not attached	
3. Details of exceptional circumstances				
Exceptional circumstances leading to exceedance	√ Localised impact on a monitor	√ Anthropogenic extreme event	<input type="checkbox"/> Natural disaster or natural extreme event	<input type="checkbox"/> Other
Explanation of circumstances leading to exceedance event	Fire broke out at the New Zealand International Convention Centre (NZICC) construction site at approximately 13:15 pm on 22 October 2019. The smoke was dispersed by the west-southwest winds and caused the PM ₁₀ exceedance at the Queen Street station on 23 October. See attached documentations 1 and 2 for details.			
Reasons why these circumstances were beyond the reasonable control of the regional council	The accidental breakout of the NZICC fire during the construction phase and the fire's severity were beyond the reasonable control of Auckland Council. In addition, large scale fires, such as the NZICC fire, are considered as exceptional circumstances beyond the reasonable control of a Local Authority in the NES AQ Users' Guide (2014) (Section 3.8.1, page 45). See attached documentation 4 for details.			
Supporting evidence (eg, meteorological report)	√ Attached		<input type="checkbox"/> Not attached	

8 January 2020

Xc Shanjia

Dated

Signed

NZICC fire, PM₁₀ exceedance and analysis

At approximately 13:15 pm on 22 October 2019, fire broke out at the New Zealand International Convention Centre (NZICC) construction site in central Auckland. The fire was located in the roof space and quickly spread. The Queen Street station is located on a veranda over the footpath 4 m above Queen Street, in the city centre. Figure 1.1 shows its location in relation to the NZICC.

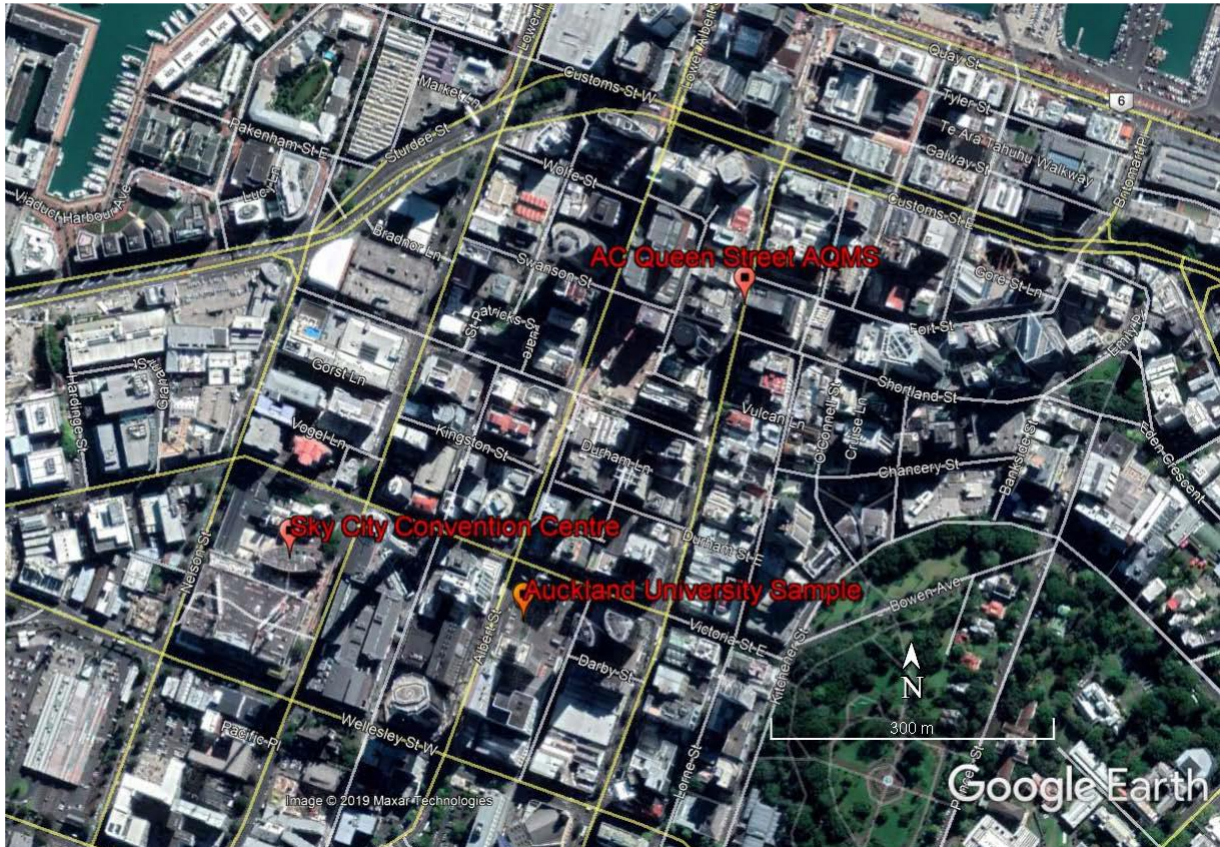


Figure 1.1 Central Auckland air particulate matter sampling sites during the NZICC fire. Also shown is the Auckland University sample site for compositional analysis of airborne particulate matter by GNS (see attached documentation 5) (Map source: Google Earth).

Continuous PM_{2.5} and PM₁₀ monitoring data (Figure 1.2) from the Queen Street site shows that there was some elevated but intermittent particulate matter PM₁₀ concentrations primarily driven by the smaller PM_{2.5} fraction at the site during the afternoon of 22 October, consistent with a wafting smoke plume.

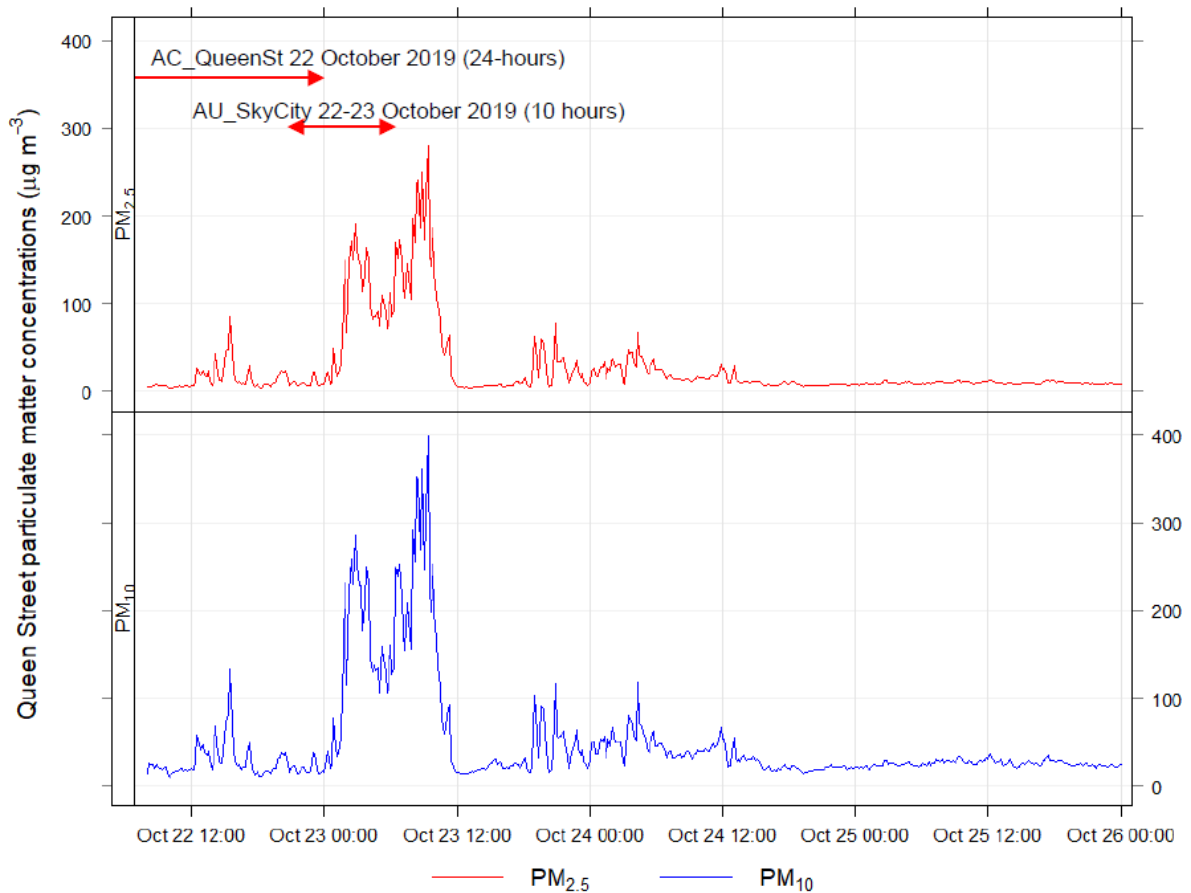


Figure 1.2 Continuous PM_{2.5} and PM₁₀ concentrations from the Queen Street monitoring site. The red arrows show the time period covered by Auckland Council and Auckland University samples used for compositional analysis of airborne particulate matter by GNS (see attached documentation 5).

The webcam image (Figure 1.3), captured soon after the fire began, shows winds out of the west-southwest quarter, blowing the smoke from the fire toward the general direction of the lower Queen Street and Auckland downtown area. As shown in Figure 1.2, the highest PM₁₀ concentrations measured at the Queen Street site occurred from the early hours of 23 October through to about midday of the same day, most likely due to a combination of peak fire emissions and higher wind speeds pushing the smoke lower to ground level as shown in the webcam image (Figure 1.4), taken just after 10:00 am on 23 October. This resulted in a PM₁₀ 24 hour average of 99 µg m⁻³ on 23 October, an exceedance of the national PM₁₀ standard 50 µg m⁻³. The PM₁₀ 24 hour average rose from 28 µg m⁻³ on 22 October, peaked at 99 µg m⁻³ on 23 October, then fell to 36 µg m⁻³ on 24 October.



Figure 1.3 Webcam image looking east from the silo marina, captured at 1:17 pm 22 October 2019, showing smoke from the fire blowing across downtown Auckland. The base of the Sky Tower can be seen at top right. (Source: SnapIt webcam Silo Marina, Auckland.)



Figure 1.4 Webcam image looking east from the silo marina, captured at 10:10 am 23 October 2019, showing smoke from the fire blowing across downtown Auckland. The base of the Sky Tower can be seen at top right. (Source: SnapIt webcam Silo Marina, Auckland.)

The NZICC fire involved the combustion of bituminous sealing material, straw used for insulation, wood, and other construction materials. Emissions to atmosphere from the combustion of materials (fuels) include particulate matter (smoke), gases and liquid droplets with the relative mix depending on the type of fuel, the nature of the combustion process and a range of other factors. The composition and size range of the particulate matter produced depends on composition of the material being burnt and the temperature that it burns at. The downwind concentrations of particulate matter emissions from a single large fire, such as the NZICC, depends on factors such as the height of smoke release, wind speed and direction, along with the location and height of a receptor site with respect to the fire.

The composition of two particulate matter samples collected during the NZICC construction site fire in central Auckland show the impact of the combustion products. The Queen Street site PM₁₀ sample collected over 24 hours on the 22 October 2019 shows a lesser but distinct signature, primarily by the presence of elevated black carbon and arsenic, due to the amount of smoke impacting at that monitoring station during the sample period (ending at 23:59 on 22 October 2019). The continuous PM_{2.5} and PM₁₀ data reflect this with the major impact at the site occurring in the early hours of 23 October through to midday. The total suspended particulate matter sample collected near the Sky City complex by University of Auckland from the evening of 22 October through to the morning of 23 October 2019 shows a more substantial impact of combustion emissions, with elevated concentrations of heavy metals such as arsenic, vanadium and nickel, along with other combustion products.

Overall, the PM₁₀ exceedance at the Queen Street site on 23 October 2019 was due to the smoke dispersed from the NZICC fire by the west-southwest winds. The compositional analysis of airborne particulate matter samples associated with the NZICC fire found elevated levels of black carbon, zinc and arsenic. These results were expected from a large building fire, as construction materials like bitumen, treated and untreated timber all release particulate matter when burned.

Attached documentation 2

Media articles about the NZICC fire and its impact on Auckland's air quality

As it happened: SkyCity convention centre fire in Auckland

<https://www.newshub.co.nz/home/new-zealand/2019/10/huge-fire-at-sky-city-convention-centre.html>



Photo credit: Newshub.

Smoke, fire and Auckland's air quality:

<https://ourauckland.aucklandcouncil.govt.nz/articles/news/2019/10/smoke-fire-and-aucklands-air-quality/>



Paul explains which areas experienced the worst of the smoke since Tuesday afternoon.

NZICC fire air quality results finalised:

<https://ourauckland.aucklandcouncil.govt.nz/articles/news/2019/11/nzicc-fire-air-quality-results-finalised/>

Analysis of baseline data

The Queen Street station is located on a veranda over the footpath 4 m above Queen Street in the city centre (see Figure 1.1 of attached documentation 1). Air pollution sources are mainly from vehicle emissions, residential home heating (during winter), and shipping. Table 3.1 shows an analysis of PM₁₀ data at the Queen Street station from 2014 to 2019 (annual maximum and 2nd highest 24 hour averages). PM₁₀ levels met the national standard (a 24 hour average of 50 µg m⁻³) except for the exceedance on 23 October 2019 (24 hour average 99 µg m⁻³).

Table 3.1 Analysis of PM₁₀ data at the Queen Street station (24 hour average, µg m⁻³).

Year	2014	2015	2016	2017	2018	2019
Maximum	38.7	37.4	32.0	30.3	34.9	99.4
2 nd highest	36.5	35.6	31.8	29.3	32.0	45.8
Valid data	87%	88%	45%	81%	98%	90%

Reasons why these circumstances were beyond the reasonable control of the regional council

Large scale fires, such as accidental property fires and of industrial accidents, are considered as exceptional circumstances beyond the reasonable control of a Local Authority in the NES AQ Users' Guide (2014) (Section 3.8.1, page 45).

After the fire at the New Zealand International Convention Centre (NZICC) broke out at 13:15, 22 October 2019, a Major Incident (six-level alarm) was declared by Fire and Emergency NZ. Fire and Emergency NZ were the lead incident controller and determined that the safest method for fighting the fire was to let the roof structure burn out. This took over 36 hours, with constant active fire-fighting management techniques employed throughout.

Auckland Emergency Management were involved in a reactive role with public health messaging regarding the smoke plume as part of the incident response. Auckland Council was the delegated authority for granting Resource Consents under the Resource Management Act 1991 and Building Consents under the Building Act 2004 for the NZICC. However, the accidental breakout of fire during the construction phase and the fire's severity were beyond the reasonable control of the Council in these regulatory roles. The fire caused the exceedance of the NES AQ PM₁₀ Standard at the Queen Street site on 23 October, in spite of the fire-fighting responses by Fire and Emergency NZ.

Overall, the exceedance at the Queen Street site is considered to meet the five criteria used to assess applications for exceptional events.

1. Causation – whether the exceedance was caused by the events being assessed. The exceedance is believed to be caused by the smoke of the New Zealand International Convention Centre (NZICC) fire. The smoke was dispersed by the west-southwest winds and caused the PM₁₀ exceedance at the Queen Street station on 23 October.

2. Control –the circumstances must be beyond the reasonable control of the regional council. The accidental breakout of the NZICC fire during the construction phase and the fire's severity were beyond the reasonable control of Auckland Council. In addition, large scale fires, such as the NZICC fire, are considered as exceptional circumstances beyond the reasonable control of a Local Authority in the NES AQ Users' Guide (2014) (Section 3.8.1, page 45).

3. Foreseeability – an assessment of whether the circumstances were able to be reasonably predicted and/or planned for. Auckland Council was the delegated authority for granting Resource Consents under the Resource Management Act 1991 and Building Consents under the Building Act 2004 for the NZICC. However, the accidental breakout of fire during the construction phase and the fire's severity were not able to be reasonably predicted and/or planned for by the Council.

4. Frequency and likelihood of reoccurrence – an assessment of how unusual the events were. The NZICC fire was unprecedented in Auckland in terms of its location (in the city centre), scale (a large-scale fire), and severity (a Major Incident (six-level alarm) declared by Fire and Emergency NZ). A similar event of the NZICC fire is unlikely to recur.

5. Purpose of the RMA – whether a determination that circumstances were exceptional is consistent with the purpose of the RMA. Regional councils and unitary authorities are tasked with managing air quality under the RMA and given powers to control discharges to air from anthropogenic sources. The circumstances associated with the exceedance (ie, the NZICC fire) were exceptional, unlikely to recur, and beyond the reasonable control of Auckland Council. Therefore, a determination that unmanageable circumstances (ie, the NZICC fire) were exceptional is consistent with the purpose of the RMA.

Attached documentation 5

Source speciation and other analysis

See another attached file: 3 source speciation and other analysis.pdf.