

3.9 Air quality schedules

Schedule AQL1: Regional ambient air quality targets (RAAQT)

As outlined in Objective AQL2, the following five categories have been developed for setting Regional Ambient Air Quality Targets (RAAQT) for the Canterbury Region. They are based on the five categories used by the Ministry for the Environment for the Proposed National Ambient Air Quality Guidelines 2002 (NAAQG).

Category	Measured value	Comment
Action	Exceeds the NAAQG value	Exceedences of the NAAQG are a cause for concern and warrant action if they occur on a regular basis.
Alert	Between 66% and 100% of the NAAQG value	This is a warning level, which can lead to exceedences if trends are not curbed.
Acceptable	Between 33% and 66% of the NAAQG value	This is a broad category, where maximum values might be of concern in some sensitive locations, but are generally at a level that does not warrant dramatic action.
Good	Between 10% and 33% of the NAAQG value	Peak measurements in this range are unlikely to affect air quality.
Excellent	Less than 10% of the NAAQG value	Of little concern: if maximum values are less than a tenth of the guideline, average values are likely to be much less.

These categories are applied to the primary air pollutants and priority hazardous air pollutants listed in the following two tables.

Primary air pollutants

Contaminant	Regional Ambient Air Quality Targets (RAAQT) <u>-Upper Thresholds</u>				Averaging Period	Preferred Techniques of Measurement
	Alert	Acceptable	Good	Excellent		
Carbon monoxide (CO)	30 mg/m ³ *	20 mg/m ³	10 mg/m ³	3 mg/m ³	1-hour	AS3580.7.1 – 1992
	10 mg/m ³ *	7 mg/m ³	3 mg/m ³	1 mg/m ³	8-hour	
Suspended Particulate (PM ₁₀) *	50 µg/m ³	33 µg/m ³	17 µg/m ³	No target set	24-hour	AS3580.9.8 – 2001 TEOM® at 40 C <u>US 40 CFR Part 50, Appendix J</u>
	<u>20 µg/m³</u>	<u>13.2 µg/m³</u>	<u>5.61 µg/m³</u>	<u>No target set</u>	<u>Annual</u>	
Suspended Particulate (PM _{2.5}) **	25 µg/m ³ **	17 µg/m ³	No target set	No target set	24-hour	TEOM at 40 C
Sulphur Dioxide (SO ₂)***	350 µg/m ³	230 µg/m ³	115 µg/m ³	35 µg/m ³	1-hour	AS3580.4.1 – 1990
	120 µg/m ³	80 µg/m ³	40 µg/m ³	12 µg/m ³	24-hour	
Nitrogen dioxide (NO ₂)	200 µg/m ³	132 µg/m ³	66 µg/m ³	20 µg/m ³	1-hour	AS3580.5.1 – 1993
	100 µg/m ³	66 µg/m ³	33 µg/m ³	10 µg/m ³	24-hour	
Ozone (O ₃)	150 µg/m ³	100 µg/m ³	50 µg/m ³	15 µg/m ³	1-hour	AS3580.6.1 – 1990
	100 µg/m ³	66 µg/m ³	33 µg/m ³	10 µg/m ³	8-hour	
Hydrogen sulphide (H ₂ S)	7 µg/m ³	No target set	No target set	No target set	1-hour	AS3580.4.1 – 1990, coupled with a H ₂ S to SO ₂ converter.
Lead (Pb) - content of PM ₁₀	0.2 µg/m ³	0.13 µg/m ³	0.06µg/m ³	0.06µg/ m ³	3 month moving <u>average</u> , calculated monthly	US40 CFR Part 50, Appendix J US40 CFR Part 50, Appendix G

Notes: No exceedences of these targets are envisaged, except for PM₁₀ (refer Objective AQL3)

µg/m³ is micrograms per cubic metre

mg/m³ is milligrams per cubic metre

TEOM® is tapered element oscillating micro-balance technique of monitoring

* ~~The NAAQG for CO is to be reviewed by the Ministry for the Environment by 2002. Where a tapered elemental oscillating microbalance (TEOM®) is used to monitor PM₁₀ and PM_{2.5}, another recommended monitoring method should be co-located at the site for at least one year to calculate an appropriate adjustment factor~~

** ~~The NAAQG for PM_{2.5} is proposed as an interim monitoring guideline. The Ministry for the Environment will consider developing a formal guideline value for PM_{2.5} by 2004.~~

*** The sulphur dioxide values do not apply to sulphur acid mist.

Priority hazardous air pollutants

Contaminant	Regional Ambient Air Quality Targets (RAAQT) <u>-Upper Thresholds</u>				Averaging Period	Preferred Techniques of Measurement
	Alert	Acceptable	Good	Excellent		
Benzene (year 2000 2)	10 µg/m ³	6.66µg/m ³	3.33 µg/m ³	1 µg/m ³	Annual	USEPA method TO-1, or equivalent
Benzene (year 2010)	3.6 µg/m ³	2.38 µg/m ³	1.19 µg/m ³	0.36 µg/m ³	Annual	
1,3-Butadiene	2.4 µg/m ³	1.58 µg/m ³	0.79 µg/m ³	0.24 µg/m ³	Annual	
Formaldehyde	15 µg/m³ 100 µg/m ³	10 µg/m³ 66 µg/m ³	5 µg/m³ 33 µg/m ³	15 µg/m³ 10 µg/m ³	Annual 30 minutes	USEPA method TO-11A, or equivalent
Acetaldehyde	30 µg/m ³	20 µg/m ³	10 µg/m ³	3 µg/m ³	Annual	
Benzo (a) pyrene	0.0003 µg/m ³	0.0002 µg/m ³	0.00001 µg/m ³	0.00003 µg/m ³	Annual	USEPA method TO-13A
Mercury (inorganic)*	0.33 µg/m ³	0.22 µg/m ³	0.11 µg/m ³	0.03 µg/m ³	Annual	PM ₁₀ sampling sampling in accordance with 40 CFR Part 50, Appendix J, followed by analysis using atomic absorption spectroscopy or an equivalent method. For Mercury – Method IO-5 (Sampling and Analysis for Vapour and particle Phase Mercury in Ambient Air Utilising Cold Vapour Atomic Fluorescence Spectrometry).
Mercury (organic)*	0.13 µg/m ³	0.09 µg/m ³	0.04 µg/m ³	0.01 µg/m ³	Annual	
Chromium VI*	0.0011 µg/m ³	0.0007 µg/m ³	0.0004 µg/m ³	0.0001 µg/m ³	Annual	
Chromium (other forms)*	0.11 µg/m ³	0.07 µg/m ³	0.04 µg/m ³	0.01 µg/m ³	Annual	
Arsenic (inorganic)*	0.0055 µg/m ³	0.0036 µg/m ³	0.0018 µg/m ³	0.0006 µg/m ³	Annual	
Arsenic (arsine)*	0.055 µg/m ³	0.036 µg/m ³	0.018 µg/m ³	0.006 µg/m ³	Annual	

Notes: No exceedences of these targets are envisaged

µg/m³ is micrograms per cubic metre

mg/m³ is milligrams per cubic metre

* The guideline values for metals are for inhalation exposure only; they do not include exposure from other routes such as ingestion. These other routes should be considered in assessments where appropriate.

Schedule AQL2: Other hazardous air pollutants

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
60-35-5	Acetamide	
75-05-8	Acetonitrile	
98-86-2	Acetophenone	D
53-96-3	2-Acetylaminofluorene	
107-02-8	Acrolein	C
79-06-1	Acrylamide	B2
79-10-7	Acrylic acid	
107-13-1	Acrylonitrile	B1
107-05-1	Allyl chloride	
92-67-1	4-Aminobiphenyl	
62-53-3	Aniline	B2
90-04-0	o-Anisidine	
1332-21-4	Asbestos	A
92-87-5	Benzidine	A
98-07-7	Benzotrichloride	B2
100-44-7	Benzyl chloride	B2
92-52-4	Biphenyl	D
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	B2
542-88-1	Bis(chloromethyl)ether	A
75-25-2	Bromoform	B2
156-62-7	Calcium cyanamide	
105-60-2	Caprolactam	
133-06-2	Captan	
63-25-2	Carbaryl	
75-15-0	Carbon disulfide	
56-23-5	Carbon tetrachloride	B2
463-58-1	Carbonyl sulfide	
120-80-9	Catechol	
133-90-4	Chloramben	
57-74-9	Chlordane	B2
7782-50-5	Chlorine	
79-11-8	Chloroacetic acid	

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
532-27-4	2-Chloroacetophenone	
108-90-7	Chlorobenzene	D
510-15-6	Chlorobenzilate	
67-66-3	Chloroform	B2
107-30-2	Chloromethyl methyl ether	A
126-99-8	Chloroprene	
1319-77-3	Cresol/cresylic acid (mixed isomers)	C
95-48-7	o-Cresol	C
108-39-4	m-Cresol	C
106-44-5	p-Cresol	C
98-82-8	Cumene	
	2,4-D (2,4-Dichlorophenoxyacetic acid) (including salts and esters)	
72-55-9	DDE (1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene)	B2
334-88-3	Diazomethane	
132-64-9	Dibenzofuran	D
96-12-8	1,2-Dibromo-3-chloropropane	
84-74-2	Dibutyl phthalate	D
106-46-7	1,4-Dichlorobenzene	
91-94-1	3,3'-Dichlorobenzidine	B2
111-44-4	Dichloroethyl ether (bis[2-chloroethyl]ether)	B2
542-75-6	1,3-Dichloropropene	
62-73-7	Dichlorvos	B2
111-42-4	Diethanolamine	
64-67-5	Diethyl sulfate	
119-90-4	3,3'-Dimethoxybenzidine	
60-11-7	4-Dimethylaminoazobenzene	

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
121-69-7	N,N-Dimethylaniline	
119-93-7	3,3'-Dimethylbenzidine	
79-44-7	Dimethylcarbonyl chloride	
68-12-2	N,N-Dimethylformamide	
57-14-7	1,1-Dimethylhydrazine	
131-11-3	Dimethyl phthalate	D
77-78-1	Dimethyl sulfate 4,6-Dinitro-o-cresol (including salts)	B2
51-28-5	2,4-Dinitrophenol	
121-14-2	2,4-Dinitrotoluene	B2
123-91-1	1,4-Dioxane (1,4-Diethyleneoxide)	B2
122-66-7	1,2-Diphenylhydrazine	B2
106-89-8	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	B2
106-88-7	1,2-Epoxybutane	
140-88-5	Ethyl acrylate	
100-41-4	Ethylbenzene	D
51-79-6	Ethyl carbamate (urethane)	
75-00-3	Ethyl chloride (Chloroethane)	
106-93-4	Ethylene dibromide (Dibromoethane)	B2
107-06-2	Ethylene dichloride (1,2-Dichloroethane)	B2
107-21-1	Ethylene glycol	
151-56-4	Ethyleneimine (Aziridine)	
75-21-8	Ethylene oxide	
96-45-7	Ethylene thiourea	
75-34-3	Ethylidene dichloride (1,1-Dichloroethane)	C
76-44-8	Heptachlor	B2
118-74-1	Hexachlorobenzene	B2

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
87-68-3	Hexachlorobutadiene 1,2,3,4,5,6-Hexachlorocyclohexane (all stereo isomers, including lindane)	C
77-47-4	Hexachlorocyclopentadiene	D
67-72-1	Hexachloroethane	
822-06-0	Hexamethylene diisocyanate	
680-31-9	Hexamethylphosphoramide	
110-54-3	Hexane	
302-01-2	Hydrazine	B2
7647-01-0	Hydrochloric acid (Hydrogen chloride [gas only])	
7664-39-3	Hydrogen fluoride (Hydrofluoric acid)	
123-31-9	Hydroquinone	
78-59-1	Isophorone	C
108-31-6	Maleic anhydride	
67-56-1	Methanol	
72-43-5	Methoxychlor	D
74-83-9	Methyl bromide (Bromomethane)	D
74-87-3	Methyl chloride (Chloromethane)	
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	D
78-93-3	Methyl ethyl ketone (2-Butanone)	D
60-34-4	Methylhydrazine	
74-88-4	Methyl iodide (Iodomethane)	
108-10-1	Methyl isobutyl ketone (Hexone)	
624-83-9	Methyl isocyanate	
80-62-6	Methyl methacrylate	
1634-04-4	Methyl tert-butyl ether	

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
101-14-4	4,4'-Methylenebis (2-chloroaniline)	
75-09-2	Methylene chloride (Dichloromethane)	
101-68-8	4,4'-Methylenediphenyl di-isocyanate (MDI)	
101-77-9	4,4'-Methylenedianiline	
91-20-3	Naphthalene	D
98-95-3	Nitrobenzene	D
92-93-3	4-Nitrobiphenyl	
100-02-7	4-Nitrophenol	
79-46-9	2-Nitropropane	
684-93-5	N-Nitroso-N-methylurea	
62-75-9	N-Nitrosodimethylamine	B2
59-89-2	N-Nitrosomorpholine	
56-38-2	Parathion	C
82-68-8	Pentachloronitrobenzene (Quintobenzene)	
87-86-5	Pentachlorophenol	B2
108-95-2	Phenol	D
106-50-3	p-Phenylenediamine	
75-44-5	Phosgene	
7803-51-2	Phosphine	D
7723-14-0	Phosphorus	D
85-44-9	Phthalic anhydride	
1336-36-3	Polychlorinated biphenyls (Aroclors)	B2
1120-71-4	1,3-Propane sultone	
57-57-8	beta-Propiolactone	
123-38-6	Propionaldehyde	
114-26-1	Propoxur (Baygon)	
78-87-5	Propylene dichloride (1,2-Dichloropropane)	
75-56-9	Propylene oxide	B2
75-55-8	1,2-Propylenimine (2-Methylaziridine)	

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
91-22-5	Quinoline	
106-51-4	Quinone (p-Benzoquinone)	
100-42-5	Styrene	
96-09-3	Styrene oxide	
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin	
79-34-5	1,1,2,2-Tetrachloroethane	
127-18-4	Tetrachloroethylene (Perchloroethylene)	
7550-45-0	Titanium tetrachloride	
1008-88-3	Toluene	D
95-80-7	Toluene-2,4-diamine	
584-84-9	2,4-Toluene diisocyanate	
95-53-4	o-Toluidine	
8001-35-2	Toxophene (Chlorinated camphene)	B2
120-82-1	1,2,4-Trichlorobenzene	D
70-00-5	1,1,2-Trichloroethane	C
79-01-6	Trichloroethylene	
95-95-4	2,4,5-Trichlorophenol	
88-06-2	2,4,6-Trichlorophenol	B2
121-44-8	Triethylamine	
1582-09-8	Trifluralin	C
540-84-1	2,2,4-Trimethylpentane	
108-05-4	Vinyl acetate	
593-60-2	Vinyl bromide	
75-01-4	Vinyl chloride	
75-35-4	Vinylidene chloride (1,1-Dichloroethylene)	C
1330-20-7	Xylene (mixed isomers)	D
95-47-6	o-Xylene	
108-38-3	m-Xylene	
106-42-3	p-Xylene	

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
	Antimony Compounds	
	Arsenic Compounds (inorganic including arsine)	A
	Beryllium Compounds	B2
	Cadmium Compounds	B1
	Chromium Compounds	A
	Cobalt Compounds	
	Coke Oven Compounds	A
	Cyanide Compounds ¹	
	Glycol ethers ²	

Chemical Abstracts Service Number	Pollutant	Carcinogenic Category
	Lead Compounds	B2
	Manganese Compounds	D
	Mercury Compounds	D
	Fine mineral fibres ³	
	Nickel Compounds	A
	Polycyclic Organic Matter ⁴	
	Radionuclides (including radon) ⁵	A
	Selenium Compounds	B2

(Source: *after* Ministry for the Environment, 1994, "Ambient Air Quality Guidelines", pages 43-47)

General Note:

The Chemical Abstracts Service Number provide s a unique identifier for each chemical and is a source of additional information on the substance. It does not specify emission recommendations.

The classification system used by the United States Environmental Protection Agency in terms of confirmed or suspected carcinogens is as follows:

Carcinogenic Category	Explanation
A	Human carcinogen. Sufficient evidence to support causal association between contaminant and cancer.
B	Probably human carcinogen.
B1	Limited evidence for carcinogenicity in humans.
B2	Sufficient evidence in animals but lacking adequate data on humans.
C	Possible human carcinogen. Limited evidence of carcinogenicity in animals and an absence of data on humans.
D	Not classified. Evidence for carcinogenicity in animals is inadequate.

Technical Notes:

For all listings above which contain the word "Compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (ie antimony, arsenic, etc) as part of that chemical's infrastructure.

- (1) 'X'CN where X = H' or any other group where a formal dissociation may occur. For example, KCN or Ca (CN)₂
- (2) R-(OCH₂CH₂)_n-OR'
 - where:
 - n = 1,2 or 3
 - R = alkyl C7 or less
 - or R = phenyl or alkyl substituted phenyl
 - R' = H, or alkyl C7 or less
 - or ester, sulphate, phosphate, nitrate, sulphonate
- (3) Includes mineral fibre emissions from facilities manufacturing or processing glass, rock, or slag fibres (or other mineral derived fibres) of average diameter 1 micrometre or less.
- (4) Includes substituted and/or unsubstituted polycyclic aromatic hydrocarbons and aromatic heterocyclic compounds, with two or more fused rings, at least one of which is benzenoid (ie containing six carbon atoms and is aromatic) in structure. Polycyclic Organic Matter is a mixture of organic compounds containing one or more of these polycyclic aromatic chemicals. Polycyclic Organic Matter is generally formed or emitted during thermal processes including:
 - (a) incomplete combustion
 - (b) pyrolysis
 - (c) the volatilization, distillation or processing of fossil fuels or bitumens or
 - (d) the distillation or thermal processing of non-fossil fuels.
- (5) A type of atom which spontaneously undergoes radioactive decay.

Schedule AQL3: Modelling design ground level concentration for priority hazardous air pollutants

Contaminant	Modelling design concentration $\mu\text{g}/\text{m}^3$ 1-hour average
Benzene	22
1,3-Butadiene	45
Formaldehyde	20
Acetaldehyde	45
Mercury (inorganic)	2.0
Mercury (organic)	0.8
Chromium VI	0.0067
Chromium (other forms)	0.67
Arsenic (inorganic)	0.033
Arsenic (arsine)	0.33

Note: Background concentrations should be taken into account when applying these values.

(Source: *after* Ministry for the Environment, 2000: "Proposals for Revised and New Ambient Air Quality Guidelines", page 39)

Schedule AQL4: Exempt heritage buildings

Street Address		Name	Legal Description	# open fires	# coal burners
181	Barbadoes Street	Community of the Sacred Name	TS 1174 2276, PT1172, TS 1176	5+	
80	Bealey Avenue	Bishop's House former Deanery	Pt TR 62	2	
107	Bealey Avenue	'Country Glen Motel'/two storey English Domestic Revival residence	Lot 1 and Pt Lots 2 and 7 DP1163	5+	
82	Bealey Avenue	'Eliza's Manor House'/former dwelling	Pt TR 62	3	
118	Bealey Avenue	Dwelling 'Marli'	Lot 2 Part Lot 1 DP20583	5+	
269	Bridlepath Road	Ferrymead Park, for example 'Currah Cottage'	All the area zoned Special Purpose (Ferrymead Park) Zone in the Proposed Christchurch City Plan as at 8 May 1999 (which incorporates decisions)	5+	5+
129	Cambridge Terrace	Canterbury Club	Lot 1 DP42570	3	
50	Cathedral Square	Warners Hotel	Pt Lot 1 DP10089 Pt Lot 1 DP7483 Pts 700 and 702	1	
6	Circuit Street	Elizabeth House	Lot 3 DP17254 Lot 2 DP49533	2	
83	Clyde Road	Former home of Kate Sheppard	Lot 5 Pt Lot 4 DP12421	3	
67	Fendalton Road	Dwelling 'Daresbury'	Lot 2 DP19964 Lots 2-3 DP49363	4	
200	Hackthorne Road	Sign of the Takahe	Lots 1-17 DP6163 Lots 69-70 PT71-3	2	
34A	Hansons Lane	Dwelling 'Nydfa'	Pt Lot 24 DP15781	3	
	Ilam Road	Former Ilam homestead/University Staff Club	Pt RS 12	1	
12	Kahu Road	Riccarton House	Lot 1 DP14082, Lot 1 DP44967	1	1
185	Kilmore Street	St Luke's Vicarage	Lot 2 DP70089	4	
665	Main North Road	Former Belfast Schoolhouse	RS 41299	1	1
192	Moorhouse Avenue	Crown Hotel	Pt RS79	1	
176	Oxford Terrace	Mainland Club/'Café Roma'	Lot 1 DP10263	2	

Street Address		Name	Legal Description	# open fires	# coal burners
62	Park Terrace	Dwelling 'Weston House'	Lot 11 DP3780	2	
435	Port Hills Road	Glenmore House	Pt Lot 1 DP 12581	3	
148	Racecourse Road	'Chokebore Lodge'	Lot 30 DP49665	4	
45	Ranfurlly Street	Single storey brick villa	Lot 9 DP1351	5	
32	Salisbury Street	Former dwelling/'Ironsides House'	TS103	2	
	Savills Road, Harewood	'Tip Tree' cob cottage	Lot 1 DP 45687 RS 3089	1	1
15	Shalamar Drive	Old Stone House/'Cracroft Community Centre'	Lot 1 DP13624 Lot 21 DP29333	1	
37	Valley Road	Ngaio Marsh House	Lot 2 DP 19885	2	
2	Whisby Road	Wooden Arts and Crafts style dwelling	Lot 30 Pt Lot 1 DP2668	1	
2	Worcester Boulevard	Former Architect's Room/Arts Centre	TS 419-440	1	
2	Worcester Boulevard	Former Canterbury College Hall/the Great Hall Arts Centre	TS 419-440	1	
17	Worcester Boulevard	Single storey villa	Lot 12 DP1003	1	
21	Worcester Boulevard	Single storey villa	Lot 11 DP1003	5	
154	Worcester Street	Christchurch Club	Pt TS 759, TS 761, TS 763, TS 764, TS 765	4	

Schedule AQL5: Minimum chimney heights for permitted large scale fuel burning devices in Rules AQL23 and AQL24

Minimum chimney heights for diesel and kerosene fuel burning devices permitted by Rule AQL23 are as listed in the following table.

Maximum Net Heat Output (kW)	Minimum Chimney Height (metres above ground level)
200	7
500	7
1000	7
1500	7 ¹
2000	8 ¹

Notes: ¹ Only applies where the ridgeline of any building, land or other substantial structure within 50 metres of the stack is less than 0.4 times the stack height, as per condition 2 of Rule AQL24.

Minimum chimney heights for solid fuel and light fuel oil burning devices permitted by Rule AQL24 are as listed in the following table.

Maximum Sulphur Dioxide Emission Rate (kg/hr) ¹	Minimum Chimney Height (metres above ground level)
- (wood fuel)	7
0.15	7
0.2	7
0.3	7
0.4	7
0.5	8
0.75	11 ²
1	14 ²
1.5	17 ²
2	19 ²
3	24 ²
4	29 ²
5	33 ²
6	37 ²
7	41 ²
8	44 ²
9	47 ²

Notes: ¹ Calculated according to the equations listed below.

² Only applies where the ridgeline of any building, land or other substantial structure within 50 metres of the stack is less than 0.4 times the stack height, as per condition 2 of Rule AQL24.

Sulphur dioxide emission rate calculations

(a) Coal

Max. SO ₂ emission rate (kg/hr) =	$\frac{\text{max. coal use (kg/hr)} \times \text{max. \% sulphur content (by wt.)} \times 1.9}{100}$
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(b) Light Fuel Oil

Max. SO ₂ emission rate (kg/hr) =	$\frac{\text{max. oil use (kg/hr)}^1 \times \text{max. \% sulphur content (by wt.)} \times 2}{100}$
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Note: ¹ calculated according to the fuel use equations listed below.

Maximum fuel use calculations

(a) Coal

Max. coal use (kg/hr) =	$\frac{\text{max. energy output (kW)} \times 3.6}{0.7 \text{ (efficiency)} \times \text{gross calorific value (MJ/kg)}^1}$
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Note: ¹ Determined from the most recent publication of the Coal Research Analysis of New Zealand Industrial Coals.

(b) Light Fuel Oil

Max. oil use (kg/hr) =	$\frac{\text{max. energy output (kW)} \times 3.6}{0.75 \text{ (efficiency)} \times 43 \text{ MJ/kg (gross calorific value)}}$
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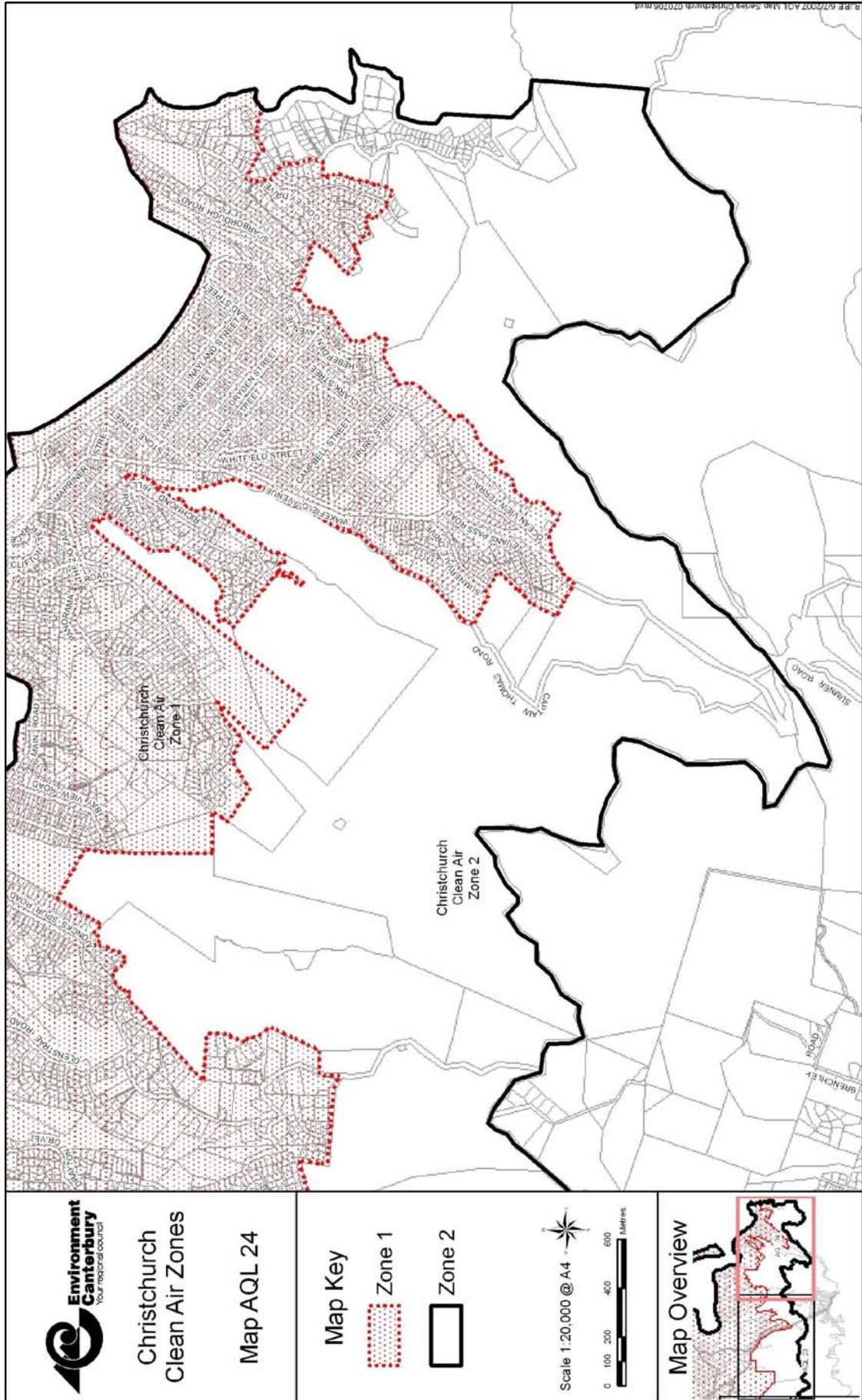
Schedule AQL6: Particulate emission measurement requirement in Rules AQL18, AQL19, AQL20, AQL21, AQL24 and AQL26

Measurement of particulate matter emissions from large scale solid fuel burning devices, under Rules AQL18, AQL19, AQL20, AQL21, AQL24 and AQL26, shall be according to the following requirements.

Measurement Requirements

The concentration of total suspended particulate in the exhaust gas stream shall be measured by a person competent in stack emissions testing. Measurement shall occur when all fuel burning equipment is operating at greater than 50 percent of the maximum continuous rating. The method of sampling and analysis shall comply with ISO 9096:1992(E), and may include methods BS 6069: 1992, ~~ASTM D3685-78~~, ASTM D3685M-92 -98, AS 4323.2-1995, US EPA Method 5, US EPA Method 17 or ~~an~~ a current equivalent method that complies with the fundamental sampling requirements of ISO 9096:1992(E). Results shall be adjusted to 0 degrees Celsius, 101.3 kilopascals, and ~~8% oxygen or~~ 12% carbon dioxide on a dry gas basis. For the purpose of this adjustment, the concentration of carbon dioxide shall be analysed using suitably calibrated equipment. The results shall include a description of the method used, the rate of appliance fuel consumption during testing and any assumptions made.



3.10 Air quality maps



**Christchurch
Clean Air Zones**

Map AQL 24

Map Key

-  Zone 1
-  Zone 2

