GUIDELINES FOR A SPECIAL WASTE INCINERATOR

1 The special waste incinerator shall be sited on an approved industrial premise.

2 The incinerator shall be designed with a combustion efficiency to destroy and remove principal organic hazardous constituents by at least 99.99%. Should the incinerator be used to destroy and remove extremely toxic and environmentally persistent wastes such as polychlorinated biphenyl (PCB), the incinerator shall be designed with a destruction and removal efficiency of at least 99.9999%.

3 The incineration process, including the feeding process, shall be automated to ensure that the operating temperature, residence time, the emission limits, and the destruction and removal efficiency are kept to within design limits at all times.

4 The incinerator shall be designed to incinerate wastes generated by the local industries. No import of wastes is allowed.

5 The incinerator shall be equipped with flue gas cleaning equipment to comply with the air emission limits as stipulated in the Schedule to the Environmental Protection and Management (Air Impurities) Regulations (at **Appendix 1**) and the special incinerator emission standards at **Appendix 2**, whichever more stringent. Continuous on-line monitoring of the flue gas emission shall be implemented based on specifications provided by NEA's Pollution Control 1 Division. The measurement of the pollutants shall be corrected to the following standard conditions: temperature of 273.15K, pressure of 101.3 kPa, 11% O2 and dry basis (i.e. 0% moisture).

6 Proper abatement facility/measures shall be put in place to minimise nuisance (e.g. dust/ smell/ noise) generated from industrial activities at the premises to the public.

7 Fugitive emission control of hydrocarbons shall be incorporated into the plant design. The control shall include the use of vapour return lines from volatile hydrocarbon storage tanks to the incinerator or to the treatment system.

8 Fire prevention and protection measures shall be incorporated into the plant design.

9 Solid residues from the incineration plant, including fly ash, shall be collected and treated to comply with the leachate standards at **Appendix 3** before disposing of at an approved landfill site.

10 All wastewater from the incineration plant shall be collected and treated to comply with the standards stipulated in the Sewerage and Drainage (Trade Effluent) Regulations before discharge into the public sewer. Approval for discharge of trade effluent into sewers must be obtained from the Public Utilities Board (PUB) prior to any discharge. Contaminated rainwater, if any, shall be collected and treated to comply with the discharge limits stipulated in the Environmental Protection and Management (Trade Effluent) Regulations prior to discharge into the stormwater drain. A sampling sump for surface run-off outlet shall be provided outside the premises.

Appendix 1

Environmental Protection and Management (Air Impurities) Regulations

Substance	Trade, industry, process, fuel burning equipment or industrial plant	Emission limits
(a) Ammonia and ammonium compounds	Any trade, industry or process	30 mg/Nm^3 expressed as ammonia
(b) Antimony and its compounds	Any trade, industry or process	5 mg/Nm^3 expressed as antimony
(c) Arsenic and its compounds	Any trade, industry or process	1 mg/Nm^3 expressed as arsenic
(d) Benzene	Any trade, industry or process	5 mg/Nm^3
(e) Cadmium and its compounds	Any trade, industry or process	0.05 mg/Nm^3 expressed as cadmium
(f) Carbon monoxide*	Any trade, industry, process or fuel burning process	250 mg/Nm^3
(g) Chlorine	Any trade, industry or process	32 mg/Nm^3
(h) Copper and its compounds	Any trade, industry or process	5 mg/Nm^3 expressed as copper
(i) Dioxins and furans^	Any waste incinerator	i. 1.0 ng TEQ/Nm^3 for waste incinerators commissioned before 1st Jan 2001 ii. 0.1 ng TEQ/Nm^3 for waste incinerators commissioned on or after 1st Jan 2001
(j) Ethylene oxide	Any trade, industry or process	5 mg/Nm^3
(k) Fluorine, hydrofluoric acid or inorganic fluorine compounds	Any trade, industry or process	10 mg/Nm^3 expressed as hydrofluoric acid
(l) Formaldehyde	Any trade, industry or process	20 mg/Nm^3
(m) Hydrogen chloride	Any trade, industry or process	200 mg/Nm^3
(n) Hydrogen sulphide	Any trade, industry or process	7.6 mg/Nm^3
(o) Lead and its compounds	Any trade, industry or process	0.5 mg/Nm^3 expressed as lead
(p) Mercury and its compounds	Any trade, industry or process	0.05 mg/Nm^3 expressed as mercury
(q) Oxides of nitrogen*	Any trade, industry, process or fuel burning equipment	400 mg/Nm^3 expressed as nitrogen dioxide

Substance	Trade, industry, process, fuel burning equipment or industrial plant	Emission limits
(r) Particulate substances including smoke, soot, dust, ash, fly-ash, cinders, cement, lime, alumina, grit and other solid particles of any kind*	Any trade, industry, process, fuel burning equipment or industrial plant (except for any cold blast foundry cupolas)	i. 50 mg/Nm^3; or ii. where there is more than one flue, duct of any kind in any schedules premises, the total mass of the particulate emissions from all of such flue, duct or chimney divided by the total volume of such emissions shall not exceed 50 mg/Nm^3 and the particulate emissions from each of such flue, duct or chimney shall not exceed 100mg/Nm^3 at any point in time.
(s) Smoke	All stationary fuel-burning sources	Ringelmann No. 1 or equivalent opacity. (Not to exceed more than 5 minutes in any period of one hour)
(t) Styrene monomer	Any trade, industry or process	100 mg/Nm^3
(u) Sulphur dioxide (non-combustion sources)	Any trade, industry or process	500 mg/Nm^3
(v) Sulphur dioxide (combustion sources)*	Any trade, industry or process	i. 1,700 mg/Nm; or ii. where there is more than one flue, duct in any schedules premises, the total mass of the sulphur dioxide emissions from all of such flue, duct or chimney divided by the total volume of such emissions shall not exceed 1,700 mg/Nm^3 on a daily basis.
(w) Sulphur trioxide and other acid gases	The manufacture of sulphuric acid	500 mg/Nm^3 expressed as sulphur trioxide. Effluent gases shall be free from persistent mist.
(x) Sulphur trioxide or Sulphuric acid mist	Any trade, industry or process, other than any combustion process and any plant involving the manufacture of sulphuric acid	100 mg/Nm^3 expressed as sulphur trioxide
(y) Vinyl chloride monomer	Any trade, industry or process	20 mg/Nm^3

**Existing plants commissioned before 1 Jul 2015 must comply with the revised standards for industrial air emission limits from 1 Jul 2023.*

^Refer to the Schedule found in the Environmental Protection and Management (Air Impurities) Regulations for the Toxic Equivalency Factors used for calculating the Toxic Equivalent (TEQ) of dioxins and furans.

Appendix 2

SPECIAL EMISSION STANDARDS FOR WASTE INCINERATORS

POLLUTANT	STANDARD
Smoke (Ringelmann Chart)	Ringelmann Shade No. 0
Particulate substances	50mg/Nm^3
Sulphur dioxide	200 mg/Nm^3
Hydrogen chloride	60 mg/Nm^3
Hydrogen fluoride	5 mg/Nm^3
Nitrogen oxide	400 mg/Nm^3
Carbon monoxide	100 mg/Nm^3
Mercury	0.05 mg/Nm^3
Cadmium	0.05 mg/Nm^3
Other heavy metals*	0.5 mg/Nm^3
Dioxins and furans	(i) 0.5 ng TEQ/Nm^3 for special waste incinerators commissioned before 1 Jan 2001 (ii) 0.1 ng TEQ/Nm^3 for special waste incinerators commissioned on or after 1 Jan 2001

***** *"Other heavy metals" refers to antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium. Therefore, the limit of 0.5mg/Nm^3 for "other heavy metals" applies to the sum of antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium in the flue gas of special waste incinerators.*

LEACHING TEST - RECOMMENDED ACCEPTANCE CRITERIA FOR SUITABILITY OF INDUSTRIAL WASTES FOR LANDFILL DISPOSAL

Contaminant	Maximum Concentration (mg / lit)	Source
Arsenic	5	(1) , (2)
Barium	100	(1) , (2)
Cadmium	1	(1) , (2)
Chromium	5	(1) , (2)
Copper	100	(2)
Cyanide (total)	10	(3)
Fluoride	150	(3)
Iron	100	(2)
Lead	5	(1) , (2)
Manganese	50	(2)
Mercury	0.2	(1)
Nickel	5	
Phenolic compounds (as phenol)	0.2	(2)
Selenium	1	(1) , (2)
Silver	5	(1)
Zinc	100	(2)

(1) U.S. Code of Federal Regulations (CFR), Title 40, Chapter 1, Part 261 “Identification and Listing of Hazardous Waste”.

(2) Victorian E.P.A. Industrial Waste Strategy Management Paper WMI/86, “Disposal of Immobilised Hazardous Wastes”, 1986.

(3) NSW SPCC Chemical Control Order on Aluminium Smelter Waste, February 1986.

NOTE: -

The values in this table may vary from values derived from other standards in the New South Wales legislation, the reason being that the above values are considered to be generally more appropriate for their intended purpose.

The leaching test is most applicable to non-degradable water soluble materials, including sparsely soluble minerals. These are generally heavy metals. When applied to water soluble organic compounds then generally because organic compounds are degradable to simple inorganic components, it might in some instances be appropriate to use a factor greater than 100 times the water quality standards.