

1.0 INTRODUCTION

- 1.1 Environmental impacts can be mitigated by ensuring that any development is sited in a designated area and pollution control measures are incorporated in its design.
- 1.2 The purpose of the guidelines are to serve as quick reference on pollution control requirements of the Department of Environment, Parks and Recreation for industrial development being proposed or submitted through the industry/land development authority. It is hoped that the guidelines would assist industrialists, architects, professional engineers and consultants in the design and operation of industrial premises.
- 1.3 These requirements are based on the proposed Environment Order for Brunei Darussalam and complement other pollution control related requirements that may be set by the industry, land and/or building development control authorities. The type of industrial premises covered by the guidelines is for premises listed in **Appendix 1**.
- 1.4 To ascertain the impact of the development in relation to the surrounding environment and vice versa the project proponent or developer need to submit via the industry/land development authority the following details for review by the Department of Environment, Parks and Recreation:
- (i) The trade or industry process proposed to be carried in or on the premises;
 - (ii) The measures the applicant undertakes to adopt to control land, air, water and noise pollution from the premises; and
 - (iii) The measures the applicant undertakes to adopt to manage solid waste, hazardous substances and to treat and dispose of toxic substances originating from or stored within the premises.

2.0 WATER POLLUTION CONTROL

- 2.1 General requirements for water pollution control are:
- 2.1.1 Trade effluent shall be treated to the allowable limits before discharge into a public sewer or watercourse. The recommended standards for industrial effluents to sewers that discharge themselves to a sewage treatment plant and direct discharges to the environment are given in **Appendix 2 & 3** respectively.
 - 2.1.2 Rainwater shall not be discharged into a public sewer. It shall be channelled into a watercourse. Contaminated rainwater from process areas shall be collected and treated before discharge into the watercourse.

2.1.3 Secondary containment facilities shall be provided for storage tanks containing oils and chemicals to contain accidental release of the entire content of the largest storage tank.

2.2 Specific Requirements for certain operations are as follows:

2.2.1 Chemical/Oil Store

A chemical/oil store shall be provided with facilities to contain any leak and spillage. Such an area shall not have any outlet/opening leading to a storm water drain or a sewer. All leaks and spillage shall be collected for proper disposal as toxic industrial wastes.

2.2.2 Chemical/Oil Bulk Storage Tanks

A full containment facility shall be provided for underground or above ground bulk storage tanks (including skid tanks). The capacity of the containment facility shall not be less than the capacity of the largest tank.

2.2.3 Chemical Warehouses

- (i) Separate fire compartments shall be provided for the storage of substances that can react dangerously with one another. Substances in the same hazard categories may be stored together as long as the compartment is protected against the most hazardous substance.
- (ii) A retention basin for fire fighting water shall be provided for the storage of hazardous substances.
- (iii) The floor of the chemical warehouse shall be coated with a layer of chemical-resistant material.

2.2.4 Laboratory

- (i) Wastewater generated from a chemical analysis laboratory shall be discharged into a sewer via a balancing tank, which is also known as a dilution tank.
- (ii) Wastewater generated from a biological/food analysis laboratory, however, shall be discharged directly into a sewer.

2.2.5 Aquaculture Farm

- (i) Trade effluent generated from aquaculture farms shall be treated to comply with the allowable limits before it is discharged into a watercourse. If the trade effluent does not include rainwater, it may be treated for discharge into a public sewer.
- (ii) Sludge, if generated, shall be stabilised, dewatered and disposed of as solid waste.

2.2.6 Livestock Farm

- (i) Trade effluent generated shall be collected and treated to comply with the allowable discharge limits before discharging into a public sewer or watercourse where a public sewer is not available.
- (ii) Animal wastes and sludge generated from wastewater treatment shall be stabilised, dewatered and disposed of as solid waste.
- (iii) Poultry wastes may be collected for disposal as solid wastes. The wastes shall be stored inside a storage shed with a containment facility.

2.2.7 Horticultural Farm

Pesticides and fertilizers that are approved by the Agriculture Department shall be used. The pesticides and fertilizers shall be applied strictly in accordance with the guidelines of the manufacturers or distributors to prevent pollution of surface water.

3.0 AIR POLLUTION CONTROL

- 3.1 Trade and industrial premises, which carry out activities that can generate air impurities, are required to install, operate and maintain air pollution control equipment properly and efficiently. The pollution control equipment shall be designed to comply with the allowable emission standards. The recommended emission standards for air impurities are given in **Appendix 4**. For air impurities with no prescribed emission standards, the best practical means shall be adopted to minimise air pollution. Exhaust gases from the pollution control equipment shall be emitted into the atmosphere through a discharge stack.
- 3.2 The use of open fire to dispose of waste wood, timber and other combustible wastes is prohibited.

- 3.3 Fuel burning equipment shall be efficiently operated and maintained. A chimney of an agreed height shall be provided for the safe dispersion of flue gases from fuel burning equipment. The minimum height shall be at least 3m above roof level of the factory building or 15m measured from ground level whichever is the higher.
- 3.4 Monitoring equipment shall be provided at the discharge stacks and chimneys to monitor air impurities emitted. The monitoring equipment shall be installed in accordance with the technical specifications of the equipment supplier to give accurate readings. If sampling ports are provided for manual installation of portable sampling equipment, the ports shall be installed such that they are accessible. As an alternative to monitoring the emission of air impurities at discharge stacks or chimneys, equipment may be provided to monitor the performance of automatic devices used to secure more efficient operation of any pollution control or fuel burning equipment.

4.0 NOISE POLLUTION CONTROL

- 4.1 All practical noise abatement measures shall be adopted to comply with the allowable boundary noise levels. The recommended boundary noise levels are given in **Appendix 5**.
- 4.2 Mechanical equipment such as air compressors, chillers, cooling towers and air-conditioners, etc. shall be sited as far away as practical from the noise-sensitive and residential buildings. Noise abatement measures, if required, shall be provided to comply with the allowable boundary noise levels.

5.0 HAZARDOUS SUBSTANCE CONTROL

- 5.1 Industries that need to import, store and use hazardous substances are required to obtain approval from the Department of Environment, Parks and Recreation as well as submit to the Department the Material Safety Data Sheet (MSDS) for the substances. This is in addition to obtaining the necessary approval/license/permit for the import, store and use of the substances as may be specified by the relevant authority, laws and regulations covering that specific substance (e.g. Poisons Act). Storage and handling of the substance must be in accordance with the MSDS. Depending on the quantity and substance, the Fire Services Department and Police Department may also need to be notified prior to transporting the hazardous substances. **Appendix 6** is a list of Hazardous Substances.

- 5.2 Preventive measures to minimise accidental releases of hazardous substances into the environment need to be taken and emergency response plans need to be put in place to deal with all credible accident scenarios of release of hazardous substances. The preventive measures include the following:
- (i) containers constructed and inspected in accordance with internationally acceptable standards are used for the storage of hazardous substances and affixed with approved labels;
 - (ii) storage areas are equipped with containment as well as disposal facilities to deal with any accidental release of hazardous substances;
 - (iii) route and time of transportation are specified for the transportation of hazardous substances;
 - (iv) Drivers of vehicles carrying hazardous substances need to be knowledgeable and trained on safety requirements and precautions, first aid and fire fighting.
- 5.3 Companies that store and use hazardous substances should carry out a safety audit to systematically identify and rectify weakness in their management systems and practices for handling hazardous substances on a regular basis.

6.0 HAZARDOUS INDUSTRIAL WASTE CONTROL

- 6.1 Factories are required to ensure that their hazardous wastes are treated and disposed in an environmentally safe manner. Examples of hazardous industrial wastes are listed in **Appendix 7**.
- 6.2 Department of Environment, Parks and Recreation need to be notified should the factory want to engage the services of industrial waste collectors to collect their wastes for recycling or treatment for safe disposal inside or outside the country.
- 6.3 Operators of specialised hazardous waste recycling, treatment and disposal plants are required to obtain approval from Department of Environment, Parks and Recreation to collect, treat and dispose of hazardous industrial wastes from industries. They are also required to inform the Fire Services Department when transporting the hazardous industrial wastes. The operators are required to maintain a proper record on collection, treatment and disposal of hazardous industrial wastes.

7.0 SELF-MONITORING AND SUBMISSION OF RESULTS

- 7.1 The owner or occupier of any industrial premises from which any air impurity, trade effluent or hazardous substances is generated and emitted into the atmosphere, discharged into the environment need to install suitable monitoring equipment or system, agreed by the Department of Environment, Parks and Recreation, at any point along the line of discharge, to monitor the quality and quantity of such emission or discharge or both.
- 7.2 The owner or occupier of the industrial premises with monitoring equipment or systems installed shall:
- (i) ensure that such equipment or system is working in a proper and efficient manner;
 - (ii) Keep a proper record of all monitoring results; and
 - (iii) Submit the records to the Department of Environment, Parks and Recreation on a quarterly basis and as and when may be required.
- 7.3 The owner or occupier of the industrial premises with monitoring equipment or systems installed shall report to the Department of Environment, Parks and Recreation should the level of emission or discharge fails to comply with the recommended standards or requirements.

8.0 COMPLIANCE WITH STANDARDS

- 8.1 Every new facility shall comply with the guideline's recommended standards.
- 8.2 The Department of Environment, Parks and Recreation retains the right to modify the standards. Additional standards may be introduced or specified for specific activities and circumstances.
- 8.2 Every existing facility that does not meet the guideline's recommended standards are required to operate and comply with a provisional standard agreed by the Department of Environment, Parks and Recreation within a specified time period. During such time the owner or occupier of the industrial premises that house the facility is required to report on progress of improvements made to meet the recommended standards.

9.0 USE OF OZONE DEPLETING SUBSTANCES

- 9.1 The use of ozone depleting substance (ODS) free technology is encouraged in industrial applications. ODS are also categorised as hazardous substances in **Appendix 6**, hence requirements set in part 5.0 of this guideline also applies.
- 9.2 The production of CFCs and use of CFC dependent technology is not permitted.
- 9.3 Installation of halon fire-fighting system is not allowed except when the use is deemed essential for the protection of human health or safety and no alternatives are available.

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**PREMISES COVERED UNDER THE POLLUTION CONTROL GUIDELINES FOR
INDUSTRIAL DEVELOPMENT**

Industrial Premises are any premises —

- (a) being used for —
 - (i) cement works, being works for the manufacture or packing of portland cement, similar cement or pozzolanic materials;
 - (ii) concrete works, being works for the manufacture of concrete and of each batch capacity greater than 0.5 cubic metre;
 - (iii) asphalt works, being works for the manufacture of asphalt or tarmacadam;
 - (iv) ceramic works, being works in which any products such as bricks, tiles, pipes, pottery goods, refractories or glass are manufactured in furnaces or kilns fired by any fuel;
 - (v) chemical works, being works in which acids, alkali, chemical fertilizer, soap, detergent, sodium silicates, lime or other calcium compounds, chlorine, chemicals or chemical products are manufactured;
 - (vi) coke or charcoal works, being works in which coke or charcoal is produced and quenched, cut, crushed or graded;
 - (vii) ferrous and non-ferrous metal works, being works in which metal melting process for casting and/or metal coating are carried out;
 - (viii) gas works, being works in which coal, coke, oil or other mixtures or derivatives are handled or prepared for carbonisation or gasification and in which such materials are subsequently carbonised or gasified;
 - (ix) crushing, grinding and milling works, being works in which rock, ores, minerals, chemicals or natural grain products are processed by crushing, grinding, milling or separating into different sizes by sieving, air elutriation or in any other manner;
 - (x) petroleum works, being works in which crude or shale oil or crude petroleum or other mineral oil is refined or reconditioned;

- (xi) scrap metal recovery works, being works in which scrap metals are treated in any type of furnace for recovery of metal irrespective of whether this is the primary object of any specific premises or not;
 - (xii) primary metallurgical works, being works in which ores are smelted or converted to metal of any kind;
 - (xiii) pulping works, being works in which wood or cellulose material is made into pulp;
 - (xiv) abrasive blasting works, being works in which equipment or structures are cleaned by abrasive blasting;
 - (xv) aquaculture, livestock and horticulture farms;
 - (xvi) food industry, in which slaughtering, preparing and preserving meat, manufacture of dairy products, canning and preserving of fruits and vegetables, canning, preserving and processing of fish, crustaceans and similar food, manufacture of vegetable and animal oils and fats, grain mill products, sugar factories and refineries, manufacture of or production of animal feed are carried out.
 - (xvii) vehicle manufacturing, repair and servicing and maintenance of engines, motors and mechanical pumps;
 - (xviii) waste recycling, treatment and disposal;
- (b) on which there is erected any boiler of steam generating capacity of 2,300 kilogrammes or more per hour, incinerator or furnace burning 500 kilogrammes or more of solid combustible material per hour or 220 kilogrammes or more of liquid material per hour;
- (c) being used or intended to be used for storing —
- (i) more than 100 tonnes of one or more of the following substances: chemicals, chemical products, hydrocarbons or hydrocarbon products which are toxic or which produce toxic gases on burning or on contact with water or air; or
 - (ii) more than 1,000 tonnes of one or more of the following substances: chemicals, chemical products, hydrocarbons or hydrocarbon products with a flash point lower than 55°C.

RECOMMENDED STANDARDS FOR INDUSTRIAL EFFLUENTS TO SEWERS THAT DISCHARGE TO SEWAGE TREATMENT PLANTS

Parameters	
Temperature (°C)	45
Ph	6-9
SS	1000
TDS	3000
Colour	Not Objectionable
BOD	2000
COD	4000
Amm N	50
Aluminium (as Al)	2
Arsenic (as As)	1
Barium (as Ba)	10
Boron (as B)	5
Cadmium (as Cd)	0.1
Chloride	1000
Chlorine (free)	0.5
Chromium 3 ⁺ (as Cr)	2
Chromium 6 ⁺ (as G)	1
Copper (as Cu)	5
Cyanide (as CN)	2
Fluoride (as F)	10
Hydrocarbons	20
Iron (as Fe)	20
Lead (as Pb)	5
Manganese (as Mn)	10
Mercury (as Hg)	0.1
Nickel (as Ni)	5
Oil and Grease	50
Phenols	20
Total Phosphorous (as P)	10
Selenium (as Se)	2
Sulphate (as SO ₄)	1000
Sulphide (as S)	5
Synthetic Detergents	20
Tin (as Sn)	10
Zinc (as Zn)	10

All limits are given in mg/l except pH, temperature and colour.

Note: Values are 95 percentiles based on spot samples.

Note: Other restrictions could be introduced covering other specific, and potentially troublesome, constituents. The Government retains the right to modify the proposed standards.

**RECOMMENDED EFFLUENT STANDARDS FOR DIRECT DISCHARGE
TO THE ENVIRONMENT**

Parameters	To Inland Watercourse		To Estuary	To SEA
	Above Potable Water Abstraction	Not Affecting Potable Water Abstraction		
Ph	6-9	6-9	6-9	6-9
Temperature (°C)	40	40	40	45
Colour	No Change	Not Objectionable	Not Objectionable	Not Objectionable
BOD ₅	20	20	50	-
COD	150	150	200	-
SS	30	30	50	No identifiable sewage solids
TDS	2000	2500	3000	-
Aluminium (as Al)	5	5	10	-
Arsenic (as As)	0.1	0.5	0.5	1
Barium (as Ba)	2	5	10	20
Beryllium (as Be)	0.5	1	1	2
Cadmium (as Cd)	0.05	0.1	0.1	0.1
Chromium 3 ⁺ (as Cr 3 ⁺)	0.5	1	2	2
Chromium 6 ⁺ (as Cr 6 ⁺)	0.1	0.2	0.2	0.2
Chloride (as Cl)	500	750	2000	5000
Free Chlorine (as Cl)	0.5	0.5	1	2
Cobalt (as Co)	0.1	0.2	0.5	2
Copper (as Cu)	0.5	0.5	1	1
Cyanide (as CN)	0.1	0.2	0.2	0.5
Synthetic Detergents (as ABS)	1	1	2	4
Fluoride (as F)	1.5	2	3	3
Oil and Grease	2	5	5	50
Hydrocarbons	5	5	10	30
Iron (as Fe)	1	5	5	20
Lead (as Pb)	0.1	0.5	1	1
Lithium (as Li)	5	5	10	10
Manganese (as Mn)	1	5	5	10
Mercury (as Hg)	0.005	0.005	0.005	0.005
Molybdenum (as Mo)	0.5	1	1	2
Ammoniacal Nitrogen (as N)	5	50	50	100
Nickel (as Ni)	0.2	0.5	1	2
Nitrate (as N)	10	20	30	50
Nitrite (as N)	0.5	1.0	2	5
Total Nitrogen (as N)	15	50	50	100
Phenols	0.1	0.5	0.5	1
Total Phosphorous (as P)	30	30	30	30
Radioactive Material	In accordance with limits and regulations set by the International Atomic Energy Agency			

Selenium (as Se)	0.05	0.1	0.1	1
Sulphate (as SO₄)	200	400	500	1000
Sulphide (as S)	0.5	1	1	5
Vanadium (as Va)	0.1	0.2	0.5	1
Zinc (as Zn)	1	2	5	5

All limits are given in mg/l except pH, temperature, colour and radioactive material.

Note: Values are 95 percentiles based on spot samples.

RECOMMENDED STANDARDS FOR AIR EMISSIONS

Substance	Trade, industry, process, fuel burning equipment or industrial plant	Emission limits
(a) Ammonia and ammonium compounds	Any trade, industry or process	76 mg/Nm ³ expressed as ammonia
(b) Antimony and its compounds	Any trade, industry or process	3 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	3 mg/Nm ³ expressed as cadmium
(f) Carbon monoxide	Any trade, industry, process or fuel burning equipment	625 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	0.1 ng TEQ/Nm ³
(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	50 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

Substance	Trade, industry, process, fuel burning equipment or industrial plant	Emission limits
(o) Lead and its compounds	Any trade, industry or process	5 mg/Nm ³ expressed as lead
(p) Mercury and its compounds	Any trade, industry or process	3 mg/Nm ³ expressed as mercury
(q) Oxides of nitrogen	Any trade, industry, process or fuel burning equipment	700 mg/Nm ³ expressed as nitrogen dioxide
(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) 100 mg/Nm³ ;or (ii) where there is more than one flue, duct or chimney in any scheduled 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 100mg/Nm³ and the particulate emissions from each of such flue, duct or chimney shall not exceed 200 mg/Nm³ at any point in time. (iii) Ringelmann No.1 or equivalent opacity (Not to exceed more than 5 minutes in any period of one hour)
(s) Styrene monomer	Any trade, industry or process	100 mg/Nm ³
(t) Sulphur dioxide (non-combustion sources)	Any trade, industry or process	500 mg//Nm ³
(u) 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.

Substance	Trade, industry, process, fuel burning equipment or industrial plant	Emission limits
(v) 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
(w) Vinyl chloride monomer	Any trade, industry or process	20 mg/Nm ³

Note: The concentration of any substance specified in the first column emitted from any operation in any trade, industry, process, fuel burning equipment or industrial plant specified in the second column shall not at any point before admixture with air, smoke or other gases, exceed the limits specified in the third column.

“dioxins and furans” means polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF), being tricyclic and aromatic compounds formed by 2 benzene rings which are connected by 2 oxygen atoms in PCDD and by one oxygen atom in PCDF and the hydrogen atoms of which may be replaced by up to 8 chlorine atoms;

“mg” means milligram;

“ng” means nanogram;

“Nm³” means normal cubic metre, being that amount of gas which when dry, occupies a cubic metre at a temperature of 0 degree Centigrade and at an absolute pressure of 760 millimetres of mercury;

“TEF” means Toxic Equivalency Factor;

“TEQ” means Toxic Equivalent, being the sum total of the concentrations of each of the dioxin and furan compounds specified in the first column of the table below multiplied by their corresponding TEF specified in the second column thereof:

<i>Dioxin/Furan</i>	<i>TEF</i>
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.01
Octachlorodibenzo-p-dioxin	0.0001
2,3,7,8-Tetrachlorodibenzofuran	0.1
1,2,3,7,8-Pentachlorodibenzofuran	0.05
2,3,4,7,8-Pentachlorodibenzofuran	0.5
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01
Octachlorodibenzofuran	0.0001

RECOMMENDED BOUNDARY NOISE LEVELS

Type of affected premises	Maximum permitted noise level (reckoned as the equivalent continuous noise level over the specified period) in decibels (dBA)		
	Day 7 am - 7 pm	Evening 7 pm – 11 pm	Night 11 pm -7 am
Noise Sensitive Premises	60	55	50
Residential Premises	65	60	55
Commercial Premises	70	65	60

Type of affected premises	Maximum permitted noise level (reckoned as the equivalent continuous noise level over 5 minutes) in decibels (dBA)		
	Day 7 am - 7 pm	Evening 7 pm – 11 pm	Night 11 pm -7 am
Noise Sensitive Premises	65	60	55
Residential Premises	70	65	60
Commercial Premises	75	70	65
Factory Premises	75	70	65

LIST OF HAZARDOUS SUBSTANCES

Part I – Hazardous Substances

Substance	Exclusion
Acetic acid	Substances containing not more than 80%, weight in weight, of acetic acid; Preparations and solutions for photographic use.
Acetyl bromide	
Alkali metal bifluorides; Ammonium bifluoride; Potassium fluoride; Sodium fluoride; Potassium silicofluoride; Sodium silicofluoride; Silicofluoric acid	Preparations containing not more than 0.3%, weight in weight, of potassium fluoride in radiator protectors; Preparations containing not more than 0.96%, weight in weight, of potassium fluoride in photographic chemicals; Substances containing not more than 3%, weight in weight, of sodium fluoride or sodium silicofluoride as a preservative; Substances containing sodium fluoride intended for the treatment of human ailments.
Ammonia	Preparations and solutions of ammonia containing not more than 10%, weight in weight, of ammonia; Refrigeration equipment; Photographic and plan developers; Hair colour dyes; Perm lotions; Smelling bottles.
Ammonium chlorate	
Ammonium perchlorate	

Substance	Exclusion
Anionic surface active agents	Preparations containing less than 5% by weight of anionic surface active agents; Preparations containing anionic surface active agents which are not less than 90% biodegradable under a test carried out in accordance with that part of the OECD method which is referred to as "Confirmatory Test Procedure" in European Communities Council Directive No. 73/405/EEC (C) or other equivalent test methods acceptable to the Director.
Antimony pentachloride	Polishes
Arsenical substances, the following: Arsenic acid Arsenic sulphide Arsenic trichloride Arsine Calcium arsenite Copper arsenate Copper arsenite Lead arsenate Organic compounds of arsenic Oxides of arsenic Potassium arsenite Sodium arsenate Sodium arsenite Sodium thioarsenate	Pyrites ores or sulphuric acid containing arsenical poisons as natural impurities; Animal feeding stuffs containing not more than 0.005%, weight in weight, of 4-hydroxy-3-nitrophenyl-arsonic acid and not containing any other arsenical poison; Animal feeding stuffs containing not more than 0.01%, weight in weight, of arsanilic acid and not containing any other arsenical poison; Animal feeding stuffs containing not more than 0.0375%, weight in weight, of carbarsone and not containing any other arsenical poison.
Asbestos in the form of crocidolite, amosite, chrysotile and amphiboles and products containing these forms of asbestos	Asbestos products containing chrysotile other than roofing sheets, refuse chutes, ceiling boards, partition boards, fire barriers, doors, paints, cement, floor tiles and putty; Asbestos in the form of chrysotile in any vehicle brake or clutch lining not installed in any vehicle if the packaging of the vehicle brake or clutch lining is affixed with the

Substance	Exclusion
	appropriate label.
Benzene	Substances containing less than 1%, weight in weight, of benzene.
Boric acid; Sodium borate	Boric acid or sodium borate in medicinal preparations, cosmetics, toilet preparations and substances being preparations intended for human consumption; Preparations containing boric acid or sodium borate or a combination of both where water or solvent is not the only other part of the composition.
Boron trichloride	
Boron trifluoride	
Bromine; Bromine solutions	
Cadmium-containing silver brazing alloy	
Captafol	
Carbamates	Benomyl; Carbendazim; Chlorpropham; Propham; Thiophanate-methyl; Preparations containing not more than 1%, weight in weight, of propoxur and not containing any other carbamate; Preparations containing not more than 1%, weight in weight, of methomyl and not containing any other carbamate.
Carbon tetrafluoride	
Chlorinated hydrocarbons, the following: Aldrin Benzene hexachloride (BHC) Bromocyclen Camphechlor	Paper impregnated with not more than 0.3%, weight in weight, of benzene hexachloride or gamma - BHC provided it is labelled with directions that no food, wrapped or unwrapped, or food utensils are to be placed on the treated paper, and that it is not to be used where food is prepared or served.

Substance	Exclusion
Chlorbenside Chlorbicyclen Chlordane Chlordecone Chlorfenethol Chlorfenson Chlorfensulphide Chlorobenzilate Chloropropylate Dicophane (DDT) pp'-DDT Dicofol Dieldrin Endosulfan	
Endrin Fenazaflor Fenson Fluorbenzide Gamma benzene hexachloride (Gamma - BHC) HEOD [1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a- octahydro-1, 4 (exo): 5,8 (endo)-dimethano naphthalene] HHDN [1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4 (exo):5,8 (endo)-dimethano naphthalene] Heptachlor Isobenzan	

Substance	Exclusion
Isodrin Kelevan Methoxychlor [1,1,1-trichloro-2,2-di-(p-methoxyphenyl) ethane] Tetrachlordiphenylethane [TDE; 1,1-dichloro-2,2-bis (p-chlorophenyl) ethane] Tetradifon Tetrasul Toxaphene Allied chlorinated hydrocarbon compounds used as pesticides (insecticides, acaricides, etc.)	
Chlorine	Chlorine used for chlorination of water in swimming pools.
Chlorine trifluoride	
Chlorobenzenes, the following: Monochlorobenzene Meta-dichlorobenzene Ortho-dichlorobenzene Trichlorobenzene Tetrachlorobenzene Pentachlorobenzene Hexachlorobenzene	
Chlorophenols, the following: Monochlorophenol Dichlorophenol Trichlorophenol Tetrachlorophenol Pentachlorophenol and their salts	Substances containing not more than 1%, weight in weight, of chlorophenols.

Substance	Exclusion
Chlorophenoxyacids; their salts, esters, amines	
Chloropicrin	
Chlorosilanes, the following: Hexachlorodisilane Phenyltrichlorosilane Tetrachlorosilane	
Chlorosulphonic acid	
Chromic acid	Substances containing not more than 9%, weight in weight, of chromic acid; Photographic solutions containing chromic acid in individual containers containing not more than 15 kilograms each of such solutions and of aggregate weight of not more than 500 kilograms of such solutions.
Cyanides	Ferrocyanides; Ferricyanides. Acetonitrile; Acrylonitrile; Butyronitrile; 2-Dimethylaminoacetonitrile; Isobutyronitrile; Methacrylonitrile; Propionitrile.
Diborane	
Dibromochloropropane	
Diethyl sulphate	
Dinitro-ortho-cresol (DNOC) and its salts (such as ammonium salt, potassium salt and sodium salt)"	
Dinosam; its compounds with a metal or a base	
Dinoseb and its salts and esters, which includes but is not limited to -	
Binapacryl	
Diquat; its salts	

Substance	Exclusion
Drazoxolon; its salts	Dressings on seeds.
Dustable powder formulations containing a combination of – Benomyl at or above 7 per cent, Carbofuran at above 10 per cent, thiram at or above 15 per cent	
Endothal; its salts	
Epichlorohydrin	
Ethyl mercaptan	Substances containing less than 1%, weight in weight, of ethyl mercaptan
Ethylene dichloride	
Ethylene imine	

Ethylene oxide	Mixtures of inert gases and ethylene oxide comprising not more than 12%, weight in weight, of ethylene oxide contained in cylinders of water capacity less than 47 litres and for aggregate of not more than 3 numbers of such cylinders.
Ferric chloride	
Fipronil	Formulated products containing Fipronil approved for household use and belonging to the WHO Class IV hazards
Fluorine	
Fluoroacetamide	
Formaldehyde	Substances containing not more than 5%, weight in weight, of formaldehyde; Photographic glazing or hardening solutions.
Formic acid	Substances containing not more than 5%, weight in weight, of formic acid.
Germane	
Hydrazine anhydrous; Hydrazine aqueous solutions	
Hydrochloric acid	Substances containing not more than 9% , weight in weight, of hydrochloric acid.
Hydrofluoric acid	Preparations or solutions containing not more than 2%, weight in weight, of hydrofluoric acid.
Hydrogen chloride	
Hydrogen cyanide; Hydrocyanic acid	Preparations of wild cherry;

Substance	Exclusion
	In reagent kits supplied for medical or veterinary purposes, substances containing less than the equivalent of 0.1%, weight in weight, of hydrocyanic acid.
Hydrogen fluoride	
Hydrogen selenide	
Isocyanates	Polyisocyanates containing less than 0.7%, weight in weight, of free monomeric diisocyanates; Pre-polymerised isocyanates in polyurethane paints and lacquers; Hardeners and bonding agents for immediate use in adhesives.
Lead compounds in paint	Lead compounds in paint in which the lead content is not more than 0.06% by weight of the paint; Lead compounds in paint in which the container is affixed with an appropriate label; The labels to be used for paints containing lead compounds are in accordance with Part IV of the Second Schedule.
Lead tetra-ethyl and similar lead containing compounds in petrol intended for use in Brunei Darussalam as fuel for motor vehicles	
Mercury compounds including inorganic mercury compounds, alkyl mercury compounds, alkyloxyalkyl and aryl mercury compounds, and other organic compounds of mercury	
Mercuric chloride; Mercuric iodide; Organic compounds of mercury	Dressings on seeds or bulbs; Toilet, cosmetic and therapeutic preparations containing not more than 0.01%, weight in weight, of phenyl mercuric salts as a preservative; Antiseptic dressings on toothbrushes; Textiles containing not more than 0.01%, weight in weight, of phenyl mercuric salts as a bacteriostat and fungicide.
Mercury and its compounds in batteries	Batteries other than mercury oxide batteries, zinc carbon batteries containing more than 0.001% by weight of mercury per cell and alkaline batteries, except those in button form, containing more than 0.025% by weight

Substance	Exclusion
	of mercury per cell.
Metanil yellow (sodium salt of metanilylazo-diphenylamine)	Dye-indicators used in laboratories.
Methyl chloride	
Methyl mercaptan	Substances containing less than 1%, weight in weight, of methyl mercaptan.
Monomethyltetrachloro diphenyl methane	
Monomethyl-dichloro-diphenyl methane	
Monomethyl-dibromodiphenyl methane	
Neonicotinoid compounds used as pesticides, the following:	
Imidacloprid	Formulated products containing Imidacloprid approved for household use and belonging to the WHO Class IV hazards.
Niclofolan	
Nicotine sulphate	
Nitric acid	Substances containing not more than 9%, weight in weight, of nitric acid.
Nitric oxide	
Nitrobenzene	Substances containing less than 0.1%, weight in weight, of nitrobenzene; Soaps containing less than 1%, weight in weight, of nitrobenzene; Polishes and cleansing agents.
Nitrogen trifluoride	
Oleum	
Orange II [sodium salt of p-(2-hydroxy-1-naphthylazo) benzenesulphonic acid]	
Organic peroxides	Car puttys; Substances and preparations containing not more than 3%, weight in weight, of organic peroxides; Solutions of not more than 60%, weight in weight, of methyl ethyl ketone peroxides and total aggregate weight of less than 50 kilograms of such solutions.

Substance	Exclusion
Organo-tin compounds, the following:	
Compounds of fentin	
Cyhexatin	
Tributyl tin compounds	
Ozone depleting substances, namely: (a) Chlorofluorocarbons, the following: Chloroheptafluoropropane Chloropentafluoroethane Chlorotrifluoromethane Dichlorodifluoromethane Dichlorohexafluoropropane Dichlorotetrafluoroethane Heptachlorofluoropropane Hexachlorodifluoropropane	Products containing any ozone depleting substance other than the following products: (a) in the case of chlorofluorocarbons — (i) air-conditioners in vehicles; (ii) equipment for domestic or commercial refrigeration or air-conditioning or heat pump equipment, which contains any chlorofluorocarbon substance as a refrigerant or in any insulating material of such equipment;
Pentachlorofluoroethane Pentachlorotrifluoropropane Tetrachlorodifluoroethane Tetrachlorotetrafluoropropane Trichlorofluoromethane Trichloropentafluoropropane Trichlorotrifluoroethane (b) Halons, the following: Bromochlorodifluoromethane Bromochloromethane Bromotrifluoromethane Dibromotetrafluoroethane	(iii) refrigerators that have a compressor rating which exceeds one horsepower; (iv) non-pharmaceutical aerosol products; (v) insulation boards, panels or pipe covers; (vi) polystyrene sheets or finished products; (b) in the case of Halons, portable fire extinguishers; and (c) in the case of bromotrifluoromethane, fire protection systems.

Substance	Exclusion
(c) Hydrochlorofluorocarbons, the following: 1,1-dichloro-1-fluoro-ethane 1,1-dichloro-2,2,3,3,3-pentafluoropropane 1,3-dichloro-1,2,2,3,3-pentafluoropropane 1-chloro-1,1-difluoro-ethane Chlorodifluoroethane Chlorodifluoromethane Chlorodifluoropropane Chlorofluoroethane Chlorofluoromethane Chlorofluoropropane Chlorohexafluoropropane Chloropentafluoropropane Chlorotetrafluoroethane Chlorotetrafluoropropane Chlorotrifluoroethane Chlorotrifluoropropane Dichlorodifluoroethane Dichlorodifluoropropane Dichlorofluoroethane Dichlorofluoromethane Dichlorofluoropropane Dichloropentafluoropropane Dichlorotetrafluoropropane Dichlorotrifluoroethane Dichlorotrifluoropropane Hexachlorofluoropropane Pentachlorodifluoropropane Pentachlorofluoropropane Tetrachlorodifluoropropane Tetrachlorofluoroethane Tetrachlorofluoropropane Tetrachlorotrifluoropropane	

Substance	Exclusion
Trichlorodifluoroethane	
Trichlorodifluoropropane	
Trichlorofluoroethane	
Trichlorofluoropropane	
Trichlorotetrafluoropropane	
Trichlorotrifluoropropane	
(d) Hydrobromofluorocarbons, the following:	
Bromodifluoroethane	
Bromodifluoromethane	
Bromodifluoropropane	
Bromofluoroethane	
Bromofluoromethane	
Bromofluoropropane	
Bromohexafluoropropane	
Bromopentafluoropropane	
Bromotetrafluoroethane	
Bromotetrafluoropropane	
Bromotrifluoroethane	
Bromotrifluoropropane	
Dibromodifluoroethane	
Dibromodifluoropropane	
Dibromofluoroethane	
Dibromofluoromethane	
Dibromofluoropropane	
Dibromopentafluoropropane	
Dibromotetrafluoropropane	
Dibromotrifluoroethane	
Dibromotrifluoropropane	
Hexabromofluoropropane	
Pentabromodifluoropropane	
Pentabromofluoropropane	
Tetrabromodifluoropropane	
Tetrabromofluoroethane	

Substance	Exclusion
Tetrabromofluoropropane Tetrabromotrifluoropropane Tribromodifluoroethane Tribromodifluoropropane Tribromofluoroethane Tribromofluoropropane Tribromotetrafluoropropane Tribromotrifluoropropane (e) Carbon tetrachloride (f) 1,1,1-trichloroethane (methyl chloroform) (g) Methyl bromide	
Organo-tin compounds, the following: Compounds of fentin Cyhexatin	
Paraquat; its salts	Preparation in pellet form containing not more than 5%, weight in weight, of salts of paraquat ion.
Perchloromethyl mercaptan	Substances containing less than 1%, weight in weight, of perchloromethyl mercaptan.
Phenols, the following: Catechol Cresol Hydroquinone Octyl phenol Phenol Resorcinol	Preparations containing less than 1%, weight in weight, of phenols; Phenols which are intended for the treatment of human ailments and other medical purposes; Soaps for washing; Tar (coal or wood), crude or refined; Photographic solutions containing hydroquinone in individual containers containing not more than 15 kilograms each of such solutions and of aggregate weight of not more than 500 kilograms of such solutions.
Phosgene	
Phosphides	
Phosphine	
Phosphoric acid	Substances containing not more than 50%, weight in weight, of phosphoric acid.

Substance	Exclusion
Phosphorus compounds used as pesticides (insecticides, acaricides, etc.), which includes but is not limited to: Methamidophos Methyl-parathion Monocrotophos Parathion Phosphamidon	Acephate; Bromophos; Iodofenphos; Malathion; Pirimiphos-methyl; Temephos; Tetrachlorvinphos; Trichlorfon; Preparations containing not more than 0.5%, weight in weight, of chlorpyrifos and not containing any other phosphorus compound; Preparations containing not more than 0.5%, weight in weight, of dichlorvos and not containing any other phosphorus compound; Materials impregnated with dichlorvos and not containing any other phosphorus compound for slow release; Preparations containing not more than 1%, weight in weight, of azamethiphos and not containing any other phosphorus compound.
Phosphorus oxychloride	
Phosphorus pentachloride	
Phosphorus pentafluoride	
Phosphorus trichloride	
Polybrominated biphenyls	
Polychlorinated biphenyls	
Polychlorinated terphenyls	
Potassium hydroxide	Substances containing not more than 17%, weight in weight, of potassium hydroxide; Accumulators; Batteries.
Prochloraz	
Fenvalerate	Formulated products containing Fenvalerate approved for household use and belonging to the WHO Class IV hazards

Substance	Exclusion
Sodium azide	Air bag devices in motor vehicles
Sodium hydroxide	Substances containing not more than 17%, weight in weight, of sodium hydroxide; Made-up formulated preparations either liquid or solid for biochemical tests.
Sulphur in diesel intended for use in fuel for motor vehicles or industrial plants	Sulphur in diesel in which the sulphur content is 0.005% or less by weight.
Sulphur tetrafluoride	
Sulphur trioxide	
Sulphuric acid	Substances containing not more than 9%, weight in weight, of sulphuric acid; Accumulators; Batteries; Fire extinguishers; Photographic developers containing not more than 20%, weight in weight, of sulphuric acid.
Sulphuryl chloride	
Sulphuryl fluoride	
Tetraethyl lead, tetramethyl lead and similar lead containing compounds	
Thallium; its salts	
Titanium tetrachloride	
Tris (2, 3-dibromo-l-propyl) phosphate	

Part II - General Exemptions

Adhesives;
 Anti-fouling compositions;
 Anti-fouling compositions other than those containing tributyl tin compounds as defined in Part I of this Schedule;
 Builders' materials other than those containing asbestos as defined in this List;
 Ceramics;
 Distempers;
 Electrical valves;
 Enamels;
 Explosives;
 Fillers;
 Fireworks;
 Fluorescent lamps;

Glazes;
Glue;
Inks;
Lacquer solvents;
Loading materials;
Matches;
Motor fuels and lubricants except diesel oil and petrol;
Paints other than paints containing mercury compounds, paints containing lead compounds and paints containing asbestos as defined in Part I of this Schedule;
Pharmaceutical Aerosols
Photographic paper;
Pigments other than those containing tributyl tin compounds as defined in Part I of this Schedule;
Plastics;
Propellants other than those containing ozone depleting substances;
Rubber;
Varnishes;
Vascular plants and their seeds.

LIST OF HAZARDOUS INDUSTRIAL WASTES

SW 1 METAL AND METAL-BEARING WASTES

- SW 101 Waste containing arsenic or its compound
- SW 102 Waste lead acid batteries, whole or crushed
- SW 103 Waste batteries containing cadmium and nickel or mercury or lithium
- SW 104 Dust, slag, dross or ash containing oxides or sulphate of metals including lead, cadmium, chromium, nickel, copper, vanadium or beryllium
- SW 105 Galvanic sludge
- SW 106 Residues from recovery of acid pickling liquor
- SW 107 Slag from copper processing for further processing or refining containing arsenic, lead or cadmium
- SW 108 Leaching residues from zinc processing, dust and sludge
- SW 109 Waste containing mercury or its compound
- SW 110 Waste electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl-capacitors contaminated with cadmium, mercury, lead or polychlorinated biphenyl

SW 2 WASTES CONTAINING PRINCIPALLY INORGANIC CONSTITUENTS WHICH MAY CONTAIN METALS AND ORGANIC MATERIALS

- SW 201 Asbestos wastes in sludge, dust or fibre forms
- SW 202 Waste catalysts
- SW 203 Immobilized scheduled waste, including chemically fixed, encapsulated sludge, solidified or stabilized sludge
- SW 204 Metal hydroxide, oxide or sulphate sludge containing one or several metals, including chromium, copper, nickel, zinc, lead, cadmium, aluminium, tin, vanadium and beryllium
- SW 205 Waste gypsum arising from chemical industry processes
- SW 206 Spent inorganic acids

SW 3 WASTES CONTAINING PRINCIPALLY ORGANIC CONSTITUENTS WHICH MAY CONTAIN METALS AND INORGANIC MATERIALS

- SW 301 Spent organic acids with pH ≤ 2 which are corrosive or hazardous
- SW 302 Sludge containing fluoride from the wastewater treatment system of electronic or semiconductor manufacturing plant
- SW 303 Flux waste, containing mixture of organic acids, solvents or compounds of ammonium chloride from fluxing bath of metal treatment process
- SW 304 Adhesive or glue waste containing organic solvents, excluding solid polymeric materials
- SW 305 Press cake from pre-treatment of glycerol soap lye from detergent soap or toiletries plant
- SW 306 Spent lubricating oil from industrial or automotive sources
- SW 307 Spent hydraulic oil from machines, including plastic injection moulding machines, turbines and die-casting machines
- SW 308 Spent oil-water emulsion used as coolants
- SW 309 Oil tanker sludge
- SW 310 Oil-water mixtures such as ballast water
- SW 311 Sludge from oil storage tank
- SW 312 Waste oils or oily sludge from wastewater treatment plant of refinery or crude oil terminal
- SW 313 Oily residues from automotive workshop or service station oil or grease interceptor
- SW 314 Oil contaminated earth from re-refining of used lubricating oil
- SW 315 Oil or sludge from oil refinery maintenance operation
- SW 316 Tar or tarry residues from oil refinery or petrochemical plant
- SW 317 Acid sludge from the re-refining of used lubricating oil
- SW 318 Spent organometallic compounds may be mixed with benzene excluding mercury compound, or residues of organometallic compounds, including tetraethyl lead, tetramethyl lead and organotin compounds from mixing process of anti-knock compound with gasoline
- SW 319 Waste, substances and articles containing, consisting of or contaminated with Polychlorinated Biphenyls (PCB) or Polychlorinated Triphenyls (PCT)
- SW 320 Waste phenols, phenol compounds including chlorophenol in the form of liquids or sludge
- SW 321 Waste containing formaldehyde
- SW 322 Rubber or latex wastes containing organic solvents or heavy metals

- SW 323 Waste non-halogenated organic solvents
- SW 324 Waste halogenated organic solvents
- SW 325 Waste halogenated or unhalogenated non-aqueous distillation residues arising from organic solvent recovery process
- SW 326 Uncured resin waste containing organic solvents or heavy metals including epoxy resin, phenolic resin
- SW 327 Waste organic phosphorus compound

SW 4 WASTES WHICH MAY CONTAIN EITHER INORGANIC OR ORGANIC CONSTITUENTS

- SW 401 Spent alkalis containing heavy metals
- SW 402 Spent alkalis with pH ≥ 11.5 which are corrosive or hazardous
- SW 403 Discarded drugs containing organic solvents, euphoric compounds, living vaccines, biocides or heavy metals
- SW 404 Pathogenic, clinical wastes or quarantined materials
- SW 405 Waste from the pharmaceutical products manufacturing plant or packaging of drugs
- SW 406 Clinker, slag and ashes from scheduled wastes incinerator
- SW 407 Air pollution control system residues containing dioxins, furans and their precursor
- SW 408 Contaminated soil, debris or matter resulting from clean-up of a spill of chemical or mineral oil or scheduled waste
- SW 409 Containers, bags or process equipment contaminated with chemicals or pesticides or mineral oil or scheduled wastes
- SW 410 Rags, plastics, papers or filters contaminated with paint or ink or organic solvent or mineral oil or scheduled wastes
- SW 411 Spent activated carbon excluding from the treatment of potable water and processes of the food industry and vitamin production
- SW 412 Plating bath sludge containing cyanide from metal finishing processes
- SW 413 Spent salt containing cyanide from heat treatment processes
- SW 414 Spent aqueous alkaline solution containing cyanide from treatment process metal or plastic surfaces
- SW 415 Spent quenching oils containing cyanides
- SW 416 Sludge of inks, paints, pigments, lacquer, dye or varnish
- SW 417 Waste of inks, paints, pigments, lacquer, dye or varnish

SW 418	Discarded or off-specification inks, paints, pigments, lacquer, dye or varnish products
SW 419	Spent di-isocyanates and residues of isocyanate compounds excluding solid polymeric material from foam manufacturing process
SW 420	Leachate from scheduled waste landfill or leachate from municipal solid waste landfill
SW 421	A mixture of scheduled wastes
SW 422	A mixture of scheduled and non-scheduled wastes
SW 423	Spent processing solution, discarded photographic chemicals or discarded photographic wastes from film processing or plates making
SW 424	Spent oxidizing agent
SW 425	Wastes from the production, formulation, trade or use of pesticides, herbicides or biocides
SW 426	Off-specification products from the production, formulation, trade or use of pesticides, herbicides or biocides
SW 427	Mineral sludge, including calcium hydroxide sludge, phosphate sludge, calcium sulphite sludge and carbonates sludge
SW 428	Wastes from wood preserving operation using inorganic salts containing-copper, chromium and arsenic or fluoride compounds or using compound containing chlorinated phenol or creosote
SW 429	Chemicals that are discarded or off-specification
SW 430	Obsolete laboratory chemicals
SW 431	Waste from manufacturing or processing or use of explosives
SW 432	Waste thermal (heat transfer) fluids including ethylene glycol
SW 433	Waste containing, consisting of or contaminated with peroxides
SW 5	<u>OTHER WASTE</u>
SW 501	Waste that demonstrates one or more hazardous properties by the presence of substance or products that are explosive, oxidising, flammable, toxic, harmful, corrosive, irritant, carcinogenic, teratogenic or mutagenic.