

**APPENDIX ONE  
HAZARDOUS  
SUBSTANCES**

**APPENDIX A: CLASSIFICATION OF HAZARDOUS SUBSTANCES**

UN Class	Hazard	Division	Description	Effects group	Hazard Level
1	Explosives	1.1	Articles and substances having a mass explosion hazard.	Fire/Explosion	Extreme
		1.2	Articles and substances having a projection hazard, but not a mass explosion hazard.	Fire/Explosion	High
		1.3	Articles and substances having a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard. This division comprises articles and substances that: <ul style="list-style-type: none"> <li>• Give rise to considerable radiant heat, or</li> <li>• Burn one after another, producing minor blast and/or projection effects.</li> </ul>	Fire/Explosion	Medium
		1.4, 1.5, 1.6	Not applicable		

UN Class	Hazard	Division	Description	Effects group	Hazard Level	
2	Gases	LPG	LPG	Fire/Explosion	Medium	
		2.1	Flammable gases: gases which at 20°C and a standard pressure of 101.3 kPa: <ul style="list-style-type: none"> <li>• Are ignitable when in a mixture of 13% or less by volume with air, or</li> <li>• Have a flammable range with air of at least 12% regardless of the lower flammability limit.</li> </ul> This class includes aerosols containing flammable propellants.	Fire/Explosion	High	
		2.2	Not applicable			
		2.3	Toxic gases: gases which are known to be toxic or corrosive to humans and pose a hazard to health. This division is divided into the following categories:	a) Inhalation toxicity vapours LC <sub>50</sub> : <200 ppm (=ml/m <sup>3</sup> )	Human Health	Extreme
				b) Inhalation toxicity vapours LC <sub>50</sub> : ≥ 200 ppm – 5,000 ppm (=ml/m <sup>3</sup> ).	Human Health	High

UN Class	Hazard	Division	Description	Effects Group	Hazard Level
3	Flammable Liquids		Flammable liquids comprising liquids, mixtures of liquids, or liquids containing solids in suspension which give off a flammable vapour at specific temperatures. This class is divided into three packaging groups (PG).		
		3 PGI	Flash point: <23°C Initial boiling point: <35°C	Fire/Explosion	High
		3 PGII	Flash point: <23°C Initial boiling point: >35°C	Fire/Explosion	High
		3PGIII	Flash point: ≥23°C ≤60.5°C Initial boiling point: >35°C	Fire/Explosion	Medium
		Combustible Liquids	Flash point: >60.5°C	Fire/Explosion Environment	Low Medium

UN Class	Hazard	Division	Description	Effects Group	Hazard Level
4	Flammable Solids	4.1	<ul style="list-style-type: none"> <li>Flammable solids that are readily combustible or may cause fire easily through an ignition source or friction.</li> <li>Self-reacting substances that are thermally unstable and are liable to undergo a strongly exothermic decomposition even without the participation of oxygen.</li> <li>Desensitised explosives: substances which are wetted with water or alcohol or diluted with other substances to suppress their explosive properties.</li> </ul>	Fire/Explosion	High
		4.2	Substances liable to spontaneous combustion: <ul style="list-style-type: none"> <li>Pyrophoric substances: liquid or solid substances which, even in small quantities, ignite within 5 minutes of coming in contact with air.</li> <li>Self-heating substances: solid substances which generate heat when in contact with air without additional energy supply.</li> </ul>	Fire/Explosion	Extreme
		4.3	Substances, which in contact with water, become spontaneously flammable, or emit flammable gases.	Fire/Explosion	Extreme

UN Class	Hazard	Division	Description	Effects Group	Hazard level
5	Oxidising substances and organic peroxides	5.1	Oxidising substances: substances which, in themselves are not necessarily combustible, but may cause or contribute to the combustion of other materials by yielding oxygen.	Fire/Explosion	High
		5.2	Organic peroxides: organic substances that are thermally unstable and may undergo exothermic, self-accelerating decomposition. They may: <ul style="list-style-type: none"> <li>• Be liable to explosive decomposition,</li> <li>• Burn rapidly</li> <li>• Be sensitive to impact or friction,</li> <li>• React dangerously with other substances cause damage to eyes.</li> </ul>	Fire/Explosion	Extreme

UN Class	Hazard	Division	Description	Effects Group	Hazard Level
6	Poisonous (toxic) substances	6.1	Poisonous substances: substances which are liable to cause death or injury, or harm human health if swallowed, inhaled, or contacted by the skin. This division is divided into three packaging groups (PG).		
		6.1 PGI	a) Oral toxicity Ld <sub>50</sub> (mg/kg): ≤ 1 Dermal toxicity LD <sub>50</sub> (mg/kg): ≤ 10 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): ≤ 0.5	Human health	Extreme
			b) Oral toxicity Ld <sub>50</sub> (mg/kg): > 1-5 Dermal toxicity LD <sub>50</sub> (mg/kg): >10-40 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): ≤ 0.5	Human health	High
		6.1 PGII	Oral toxicity Ld <sub>50</sub> (mg/kg): >5-50 Dermal toxicity LD <sub>50</sub> (mg/kg): > 40-200 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): >0.5-2	Human health	Medium
		6.1 PGIII	Oral toxicity Ld <sub>50</sub> (mg/kg): > 50-500 (liquids) >50-200 (solids) Dermal toxicity LD <sub>50</sub> (mg/kg): > 200-1,000 Inhalation toxicity dust/mist LC <sub>50</sub> (mg/l): > 2-10	Human health	Low
			Carcinogen	Human health	High
		6.2	Not applicable		

UN Class	Hazard	Division	Description	Effects Group	Hazard level
8	Corrosives		Substances which, by chemical action, can cause severe damage when in contact with living tissue or, In the case of leakage, will materially damage or destroy other materials. Corrosives are divided into three packaging groups (PG).		
		8 PGI	Very dangerous substances and preparations.	Human health	Medium
		8 PGII	Substances and preparation presenting medium hazard.	Environment	High
		8 PGIII	Substances and preparations presenting minor hazard.	Human health	Medium
				Environment	High
Environment	High				

UN Class	Hazard	Division	Description	Effects Group	Hazard Level
	Ecotoxic	Group 1	Ecotoxic substances: any substance exhibiting a toxic effect on the ecosystem, based on the toxicity to aquatic life. This division is divided into four categories.		
			a) 96 hr LC <sub>50</sub> salmonid fish (mg/l): <0.1 48 hr EC <sub>50</sub> daphnia (mg/l): <0.1 72 hr EC <sub>50</sub> algae (mg/l): <0.1	Environment	Extreme
			b) 96 hr LC <sub>50</sub> salmonid fish (mg/l): ≥0.1-1.0 48 hr EC <sub>50</sub> daphnia (mg/l): ≥0.1-1.0 72 hr EC <sub>50</sub> algae (mg/l): ≥0.1-1.0	Environment	High
			c) 96 hr LC <sub>50</sub> salmonid fish (mg/l): ≥1.0-10.0 48 hr EC <sub>50</sub> daphnia (mg/l): ≥1.0-10.0 72 hr EC <sub>50</sub> algae (mg/l): ≥1.0-10.0	Environment	Medium
			d) 96 hr LC <sub>50</sub> salmonid fish (mg/l): ≥ 10.0-100.0 48 hr EC <sub>50</sub> daphnia (mg/l): ≥ 10.0-100.0 72 hr EC <sub>50</sub> algae (mg/l): ≥ 10.0-100.0	Environment	Low
		Group 2	Environmentally damaging or persistent substances: any substance exhibiting a damaging (other than toxic) effect on the ecosystem. This division is divided into two categories.		
			c) BOD 5 (mg/l): >10,000	Environment	Medium
			d) BOD 5 (mg/l): >1,000	Environment	Low
		Pesticides	Pesticides are deemed to have an extreme hazard level unless data can be provided to demonstrate lesser toxicity.	Environment	Extreme
		Corrosives	All corrosives (Class 8, PG I-III) have a high Environmental Effects hazard level.	Environment	High

**APPENDIX C: INFORMATION SOURCES FOR HAZARDOUS SUBSTANCES:**

<b>Legend:</b>	1	Describes substance properties
	2	Contains information on human health effects
	3	Contains information on ecotoxicity
	4	Number of substances covered
	5	Approximate cost (at time of writing, June 1995)

TEXT BOOKS/HARD COPIES							
Author/Agency	Title	1	2	3	4	5	Comments
Sax, N I	Dangerous Properties of Industrial Materials (Van Nostrand Reinhold, London).	Yes	Yes	No		\$2,300	Comprehensive resource on substance properties and human health effects
Weiss, G	Hazardous Chemicals Data Book (Noyes Data Corp, New Jersey, USA)	Yes	?	?			
Environment Canada	Manual for Spills of Hazardous Materials	Yes	Yes	Yes	220		Good reference for a small number of common substances
Environment Canada	Canadian Water Quality Guidelines	No	No	Yes	~100		Good background information on the most common aquatic toxicants
US Environmental Protection Agency (USEPA)	Quality Criteria for Water	No	No	Yes	~100		Good background information on the most common aquatic toxicants
International Technical Information Institute (Tokyo, Japan)	Toxic and Hazardous Industrial Safety Manual	Yes	No	No			
Federal Office for Road Safety (Australia)	Australian Code for the Transport of Dangerous Goods by Road and Rail	Yes	No	No		\$50	Information about UN hazardous substances classification and numbers
International Air Transport Association	Dangerous Goods Regulations	Yes	No	No		\$150	Information about UN hazardous substances classification and numbers.
Agro-Research Enterprises Ltd	Agrichemical Directory and Hazard Response Book (Havelock North)	Yes	?	?	22,500	\$60	Identification of agrichemicals and spill response requirements
United States Coast Guard	Chemical Hazards Response Information System (CHRIS)						Focus on emergency procedures and spill response
Royal Society of Chemistry	Dictionary of Substances and their Effects (DOSE)	Yes	Yes	Yes			3 out of 7 volumes completed

FLOPPY DISK							
Author/Agency	Title	1	2	3	4	5	Comments
Brethericks	Reactive Chemical Hazards Database (Butterworth Heinemann)	Yes	No	No	4600		

CD-ROM							
Author/Agency	Title	1	2	3	4	5	Comments
Canadian Centre for Occupational Safety and Health	MSDS	Yes	Yes	?	87,000	\$350	Information on Material Safety Data Sheets (product hazards, emergency and first aid response, safe working procedures).
Canadian Centre for Occupational Safety and Health	CHEM Source	Yes	Yes	Yes	106,000	\$300	Extensive hazardous substances database containing information on substance properties, human health and environmental hazards. Includes CHEMINFO and CESARS (Chemical Evaluation Search and Retrieval System).
	US Register of Toxic Effects of Chemical Substances (RTECS)	No	Yes	No	120,000	\$300	Extensive database on human health effects of hazardous substances, including toxicity, skin/eye irritation, carcinogenicity, mutagenicity, and teratogenicity.
NZ National Poisons Centre	CD-Substance	Yes	Yes	No	16,000		Focus on medical emergencies and clean-up procedures.
SilverPlatter	CHEM-BANK	Yes	Yes	Yes	120,000	\$3432	Combination of existing hazardous substances databases: Includes HSDB, CHRIS, RTECS and OHMTADS (Oil and Hazardous Materials Technical Assistance Data System).
Committee of the EC Environmental Institute of the Joint Research Centre	ECDIN	Yes	Yes	Yes	1,700		Environmental and risk information, including ecological and economic implications
Micromedex Inc.	TOMES PLUS	Yes	Yes	Yes			Wide range of existing hazardous substances databases, including Hazardous Substances Data Bank (HSDB), Integrated Risk Information System (IRIS), Chemical Hazards RESPONSE Information System (CHRIS), and Registry of Toxic Effects of Chemical Substances (RTECS).

Other							
Author/Agency	Title	1	2	3	4	5	Comments
NZ Safety Ltd	Safeline Service						Toll-free 0800 service to assist those involved in the identification of chemical hazards. Focuses on Material Safety Data Sheets and personal protection requirements.

ON LINE DATABASES							
Author/Agency	Title	1	2	3	4	5	Comments
Canadian Centre for Occupational Health and Safety	CCINFO Line	Yes	Yes	Yes		\$400*	Comprehensive collection of 50 health and safety databases from world-wide sources (core series comprises MSDS, CHEM Source, and RTECS).
New Zealand Poisons and Hazardous Chemicals Database	New Zealand Poison Centre/Cardinal Network	Yes	Yes	No	16,000		Focus on medical emergencies and clean-up procedures.
US National Library of Medicine (NML). Access via the National Library of Australia (NLA)	Toxnet	Yes	Yes	Yes		\$25**	On-line access to HSDB, Chemical Carcinogenesis Research information System (CCRIS), RTECS, ETICBACK/EMICBACK (mutagen and teratogen databases) and IRIS
USEPA	AQUIRE (Aquatic Toxicity information Retrieval database)	No	No	Yes	525		Comprehensive information on the toxicity of chemicals on aquatic organisms
USEPA	STARA (Studies on Toxicity Applicable to Risk Assessment)	No	No	Yes	200		Contains quantitative toxicological data on environmental chemicals

\* Annual subscription rate

\*\* Hourly user charge

Other							
Author/Agency	Title	1	2	3	4	5	Comments
NZ Safety Ltd	Safeline Service						Toll-free 0800 service to assist those involved in the identification of chemical hazards. Focuses on Material Safety Data Sheets and personal protection requirements.

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US National Library of Medicine (NML). Access via the National Library of Australia (NLA)	Toxnet	Yes	Yes	Yes		\$25**	On-line access to HSDB, Chemical Carcinogenesis Research information System (CCRIS), RTECS, ETICBACK/EMICBACK (mutagen and teratogen databases) and IRIS
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USEPA	STARA (Studies on Toxicity Applicable to Risk Assessment)	No	No	Yes	200		Contains quantitative toxicological data on environmental chemicals

\* Annual subscription rate

\*\* Hourly user charge

## APPENDIX D: HAZARDOUS SUBSTANCE PROFILES

Legend: E: Extreme  
H: High  
M: Medium  
L: Low  
OSL: Outside Specified Levels  
.: Classified according to precautionary approach due to unavailability of relevant data.  
-: Not applicable to this Effects Group

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels		
							Fire explosion	Human Health	Environment
Acetaldehyde	1089	Liquid	0.780	UN 3	I	-	H	H	L
Acetone	1090	liquid	0.791	UN 3	II	-	H	OSL	OSL
Acetone Cyanohydrin	1541	liquid	0.925	UN 6.1	I	-	-	H	H*
Acetone (Synonym: Methyl Cyanide)	1648	liquid	0.787	UN 3	II	UN 6.1	H	M	H*
Acetylene	1001	Gas	-	UN 2.1	-	-	H	-	-
Acrolein (Synonym: Acrylic Aldehyde)	1092	Liquid	0.843	UN 3	I	UN 6.1	H	M	E
Aluminium Chloride (anhydrous)	1726	Solid	-	UN 8	II	-	-	M	H
Ammonia (anhydrous, liquefied)	1005	Gas	-	UN 2.3	-	-	-	H	-
Ammonium Hydroxide (>10%, ≤35% ammonia in solution)	2672	Liquid	0.880 - 0957	UN 8	III	-	-	-	H
Ammonium Nitrate (≤0.2% combustible material, free from other added matter)	1942	Solid	-	UN 5.1	III	H	H	-	OSL
Argon	1006	Gas	-	UN 2.2	-	-	-	-	-
Arsenic Trioxide	1561	Solid	-	UN 6.1	II	-	-	H	M
Benzene	1114	Liquid	0879	UN 3	II	H	H	H	M
Boric Acid	-	Solid	-	-	-	-	-	OSL	H*
Bromine	1744	Liquid	3.120	UN 8	I	-	-	M	H
Butane	1011	Gas	-	UN 2.1	-	H	H	L	-

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels		
							Fire explosion	Human Health	Environment
Cadmium Chloride	2570	Solid	-	UN 6.1	I/II/III	-	-	H	E
Calcium Hypochlorite (39% available chlorine)	1748	Solid	-	UN 5.1	II	-	H	L	H
Carbofuran	2757	Solid	-	UN 6.1	-	-	-	H	H
Carbon Dioxide	1031	Gas	-	UN 2.2	-	-	-	OSL	-
Carbon Disulphide	1131	Liquid	1.260	UN 3	II	UN 6.1	H	OSL	L
Carbon Tetrachloride	1846	Liquid	1.597	UN 6.1	II	-	-	H	H*
Chlordane	2762	Liquid	1.600	UN 6.1	-	UN 3	M	H	E
Chlorine	1017	Gas	-	UN 2.3	-	UN 6.1	-	E	-
Chloroform	1888	Liquid	1.500	UN 6.1	II	-	-	H	H*
Cresol (Synonym: Cresylic Acid)	2022	Liquid	1.050	UN 6.1	II	UN 8	-	M	H
Cypermethrin	2783	Liquid	1.240	UN 6.1	-	-	-	H	E
Diazinon	2783	Liquid	1.116	UN 6.1	II	-	-	M	L
Dicamba	2769	Solid	-	UN 6.1	III	-	-	OSL	M
Dichlorobenzene (m, o)	1591	Liquid	1.307	UN 6.1	III	-	-	L	M
Dichlorvos	2783	Liquid	1.415	UN 6.1	II	-	-	M	H*
Diesel (Fuel, Flashpoint >62° C)	1202	Liquid	0.850	UN 3	-	-	L	OSL	M
Diethylene Glycol	-	Liquid	1.118	-	-	-	-	OSL	OSL
Epichlorohydrin	2023	Liquid	1.180	UN 6.1	II	UN 3	M	H	H*
Ethane	1035	Gas	-	UN 2.1	-	UN 3	H	-	-
Ethanol (Synonym: Ethyl Alcohol)	1170	Liquid	0.790	UN 3	II	-	H	OSL	H*
Ethyl Acrylate	1917	Liquid	0.923	UN 3	II	UN 6.1	H	H	H*
Ethylene	1962	Gas	-	UN 2.1	-	-	H	-	-
Ethylene Glycol	-	Liquid	1.113	-	-	-	-	OSL	OSL
Ethyleneimine	1185	Liquid	0.832	UN 3	II	UN 6.1	H	H	H*
Fluorine	1045	Gas	-	UN 2.3	-	UN 5.1	H	E	-
Formaldehyde (37% - 50%)	1198	Liquid	1.100	UN 3	III	UN 6.1	M	H	L
Glyphosate	-	Liquid	1.170	-	-	-	-	OSL	M
Hexane	1208	Liquid	0.659	UN 3	II	-	H	OSL	H*
Hydrazine (anhydrous)	2029	Liquid	1.008	UN 3	I	UN 6.1	H	H	H
Hydrochloric Acid	1789	Liquid	1.190	UN 8	II	-	-	M	H

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard Levels		
							Fire explosion	Human Health	Environment
Hydrogen	1049	Gas	-	UN 2.1	-	-	H	-	-
Hydrogen Chloride	1050	Gas	-	UN 2.3	-	UN 8	-	H	-
Hydrogen Cyanide (Synonym: Hydrocyanic Acid)	1051	Liquid	0.689	UN 6.1	I	UN 3	H	H	H*
Hydrogen Fluoride (anhydrous)	1790	Liquid	0.950	UN 8	I	UN 6.1	-	M	H
hydrogen Peroxide (>60%)	2015	Liquid	1.290	UN 5.1	I	UN 8	H	M	H
Hydrogen Sulfide	1053	Gas	-	UN 2.1	-	UN 2.3	H	H	-
Iodine	1759	Solid	-	UN 8	I	-	-	M	H
Lauryl Mercaptan	1228	Liquid	0.850	UN 3	II	UN 6.1	H	L	H*
LPG	1075	Gas	-	UN 2.1	-	-	H	-	-
Methanol (Synonym: Methyl Alcohol)	1230	Liquid	0.792	UN 3	II	UN 6.1	H	OSL	H*
Methyl Bromide	1062	Liquid	1.680	UN 2.3	-	UN 6.1	-	H	-
Methyl Chloride	1063	Gas	-	UN 2.1	-	UN 2.3	H	H	-
Methyl Ethyl Ketone	1193	Liquid	0.806	UN 3	II	-	H	OSL	H*
Methyl Isobutyl Ketone	1245	Liquid	0.802	UN 3	II	-	H	M	H*
Methyl Isocyanate	2480	Liquid	0.960	UN 3	I	UN 6.1	H	M	H*
Methyl Mercaptan	1064	Gas	-	UN 2.1	-	UN 6.1	H	M*	-
Methylene Chloride (Synonym: Dichloromethane)	1593	Liquid	1.326	UN 6.1	III	-	-	H	L
Milk	-	Liquid	1.032	-	-	-	-	-	M
Nitric Acid	2031	Liquid	1.490	UN 8	I	-	-	M	H
Nitroglycerine	0143	Liquid	1.599	UN 1.1	-	UN 6.1	E	L	H*
Oxygen	1072	Gas	-	UN 2.2	-	UN 5.1	H	-	-
Pentachlorophenol	2020	Solid	-	UN 6.1	III	-	-	M	E
Petrol	1203	Liquid	0.703	UN 3	II	-	H	OSL	H*
Phenol	1671	Solid	-	UN 6.1	II	-	-	M	L
Phosgene	1076	Gas	-	UN 2.3	-	UN 8	-	H	-
Phosphoric Acid	1807	Solid	-	UN 8	II	-	-	M	H
Phosphorus (white, yellow)	1381	Solid	-	UN 4.2	-	UN 6.1	E	H	H*
Potassium Hydroxide (Synonym: Caustic Potash)	1813	Solid	-	UN 8	II	-	-	M	H

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and Hazard levels		
							Fire Explosion	Human Health	Environment
Potassium Permanganate	1490	Solid	-	UN 5.1	II	-	H	L	H*

Substance Name	UN No.	Substance Form	Specific Gravity	Primary Classification	Packaging Group	Subsidiary Classification	Effects Groups and hazards Levels		
							Fire Explosion	Human Health	Environment
Propylene Oxide	1280	Liquid	0.830	UN 3	I	UN 6.1	H	H	H*
Sodium Hydroxide	1823	Solid	-	UN 8	II	-	-	M	H
Sodium Selenite	2630	Solid	-	UN 6.1	I	-	-	H	M
Styrene Monomer	2055	Liquid	0.910	UN 3	III	-	M	OSL	L
Sulphur Dioxide	1079	Gas	-	UN 2.3	-	-	-	H	-
Sulphuric Acid (≥33%)	1830	Liquid	1.840	UN 8	II	-	-	M	H
1,1,2,2-Tetrachloroethane	1720	Liquid	1.590	UN 6.1	II	-	-	M	H*
Toluene	1294	Liquid	0.867	UN 3	II	-	H	OSL	H*
Toluene 2,4 Dilsocyanate	2078	Liquid	1.220	UN 6.1	II	-	-	H	H*
1,1,2-Trichloroethane	-	Liquid	1.442	UN 6.1	III	-	-	L	L
Trichloroethlyene	1710	Liquid	1.460	UN 6.1	III	-	-	L	H
Turpentine	1299	Liquid	0.860	UN 3	III	-	M	OSL	H*
Xylene (m,o,p)	1307	Liquid	0.870	UN 3	II,III	-	M	OSL	H
Zinc (powder or dust)	1436	Powder	-	UN 4.3	II	UN 4.2	E	-	H*
Zinc Ammonium Chloride	-	Solid	-	-	-	-	-	OSL	H*

APPENDIX E : WORKSHEETS TO BE PHOTOCOPIED FOR USE

WORKSHEET 1: SITE INFORMATION SHEET

Facility name	
Address	
Map reference	
Description of activity	
Nature of adjoining land use	
Proximity to potable water resource <sup>1</sup>	
Within twenty metres of a waterbody <sup>2</sup>	

Map of site (show adjoining land uses and location of waterbodies).

<sup>1</sup> Groundwater reservoir/aquifer as identified by the regional council

<sup>2</sup> “Waterbody” includes streams, springs, lakes, wetlands, sea and estuaries, but does not include aquifers and entry points to the stormwater drainage network.



**WORKSHEET 3: HAZARDOUS SUBSTANCE WORKSHEET**

1 SUBSTANCE DESCRIPTION						
Substance Name						
Proprietary Name and Supplier						
Substance Form (Gas, Liquid, Solid, Powder)						
2 AVAILABLE INFORMATION (Extract from packaging material, MSDS, UN recommendation for the Transport of Dangerous Goods (8th edition))						
UN Number						
UN Primary Class						
UN Subsidiary Class						
Packaging group(s)						
3 ADDITIONAL INFORMATION REQUIREMENTS (Extract from data sources listed in Appendix C and Material Safety Data Sheet)					DATA SOURCE	
Physical Parameters	Initial boiling point (°C)					
	Flash point (°C)					
	Specific gravity @ 20°C					
	Molecular weight					
	Vapour pressure (mm Hg at 20°C)					
Toxicity Data <sup>6</sup>	Oral toxicity LD <sub>50</sub> (mg/kg)					
	Dermal toxicity LD <sub>50</sub> (mg/kg)					
	Inhalation toxicity LC <sub>50</sub> (ppm)					
	Carcinogen <sup>7</sup> (yes/no)					
Ecotoxicity Data <sup>8</sup>	LC <sub>50</sub> (Salmonid fish) (mg/l)					
	EC <sub>50</sub> (Daphnia) (mg/l)					
	EC <sub>50</sub> (Algae) (mg/l)					
	BOD <sub>5</sub> (mg/kg)					
	Pesticide (yes/no)					
Other						
4 ASSESSMENT (Extract from information in categories 2 and 3 above and Appendix A)						
Hazard	UN Class	Division/ Packaging group	Does Hazardous property apply? (yes/no)	Effects Groups and Hazard Level <sup>9</sup>		
				Fire/Explosion	Human Health	Environmental
Explosive	1.1-1.3					
Flammable Gas	2.1					
Flammable Liquid	3					
Flammable Solid	4.1-4.3					
Oxidiser	5.1-5.2					
Toxic Gas	2.3					
Toxic Material	6.1					
Corrosive	8					
Ecotoxic						

<sup>6</sup> List lowest level available for human or mammalian species, type of species, test duration and data source.

<sup>7</sup> See Appendix B

<sup>8</sup> For LC<sub>50</sub> and EC<sub>50</sub> lowest levels for indicated or other aquatic species, type of species and data

<sup>9</sup> Use E for extreme hazard level, H for high, M for medium, L for low and OSL if hazard is outside specified levels



**WORKSHEET 5: TOTAL EFFECTS RATIOS MANUAL CALCULATION SHEET**

SUBSTANCE	Fire/Explosion Effects Ratio	Human Health Effects Ratio	Environmental Effects Ratio
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Total Effects Ratios			

Note: Only fill out those sections applicable to the substance being assessed: for example, non-flammables need not be assessed in the Fire/Explosion Effects Group

APPENDIX F: CONVERSION OF MEASUREMENT UNITS

1 Conversion of temperature

To convert degrees Fahrenheit to degrees Celsius, use the following formula:

$$^{\circ}\text{C} = \frac{5}{9} \times (\text{F} - 32)$$

2 Conversion of measurements for solids

$$1 \text{ ppm} = 1 \text{ mg/kg}$$

3 Conversion of measurements for liquids

$$1 \text{ ppm} = 1 \text{ mg/l}$$

$$1 \text{ ppb} = 1 \mu\text{g/l}$$

$$1 \text{ ppm} = 1 \text{ g/m}^3$$

$$1 \text{ ppb} = 1 \text{ mg/m}^3$$

4 Conversion of measurements for gases and vapours

$$\text{mg/m}^3 = \text{ppm} \times \frac{\text{molecular weight}}{24.04}$$