Formulators

530SW90027P

Industry Overview

If your operation is in the chemical formulating industry category and you use solvents, pesticides, strong acids or bases, ignitable chemicals, reactive chemicals, or solutions or sludges containing metals or toxic organic chemicals, you might be subject to Resource Conservation and Recovery Act (RCRA) requirements covering the generation, transportation, and management of hazardous waste.

The following *chemical formulating industry* groups are covered by this summary:

- Printing ink
- Pesticides and agricultural chemicals
- Pharmaceutical preparations
- Paint and coatings
- Chemical product formulation not elsewhere classified under chemical manufacturing.

Hazardous Wastes From Formulators

While the specific chemical constituents of your waste can vary depending on the type of chemicals you formulate, most formulators will have wastes that fall under one of the following categories:

Spent or unusable materials such as chemicals and solvents

Rinsing solutions from cleaning of containers, mixing vats, and tools

Rags and other cleaning implements.

In addition, specific formulators generate wastes such as used pesticide and pesticide containers, spent catalysts, wastes containing heavy metals, ink wastes, ignitable wastes, and reactive wastes.

Printing ink formulation involves the combination of basic constituents in proportions that depend on the desired properties of the ink. In general, inks are made from coloring materials that can include flushed colors, color concentrates, toners, and pigments; resins and varnishes; and solvents. Pigments might contain heavy metals or other toxic constituents. Resins and varnishes might contain toxic organic constituents. Many spent solvents are listed wastes. In addition to these basic ingredients, other ingredients that contain hazardous materials are sometimes added to adjust the ink's properties. These include driers, waxes, antioxidants, thickeners and gellants, defoamers, wetting agents, and surfactants. The main categories of wastes generated from the formulation of printing ink include alkaline wastes, spent solvents and solvent still bottoms, heavy metal solutions, ink sludges containing chromium or lead, and other wastes that might contain toxic organic constituents.

Pesticide and agricultural chemical formulators mix concentrated pesticides with carriers and dispersing agents for use by pesticide applicators. The formulations can include a number of compounds that enhance the properties of the pesticide product. The carriers, dispersing agents, and other compounds might contain hazardous constituents. In general, the wastes from pesticide and agricultural formulators are pesticide-contaminated rinse solutions generated from washing and rinsing the drums, vats, and assorted instruments used to mix the formulation.

Formulators of **pharmaceutical preparations** generate spent solvents and solvent still bottoms, ignitable wastes, and possibly toxic wastewaters and sludges. The formulation of **paints and coatings** (e.g., varnishes, lacquers, enamels) usually involves the use of solvents, driers, plastic resins, alcohols, phthalates, and inorganic pigments. Potentially hazardous wastes from the formulation of paints and coatings are solvent wastes, sludges, cleaning wastes, spills, and spoiled batches. Formulators of **other miscellaneous chemical products** often generate hazardous wastes including strong acid/alkaline wastes, spent solvents and still bottoms, reactive wastes, ignitable wastes, and toxic wastes.

Table 1 summarizes some of the general waste types generated during formulation. If you generate more than 100 kilograms (220 pounds or one-half of a 55-gallon drum) of hazardous waste per month, you must complete a Uniform Hazardous Waste Manifest when you ship your waste off your property. The Manifest requires the DOT (Department of Transportation) description of the waste including shipping name, hazard class, and UN/NA ID number. This information is present in Tables 2 through 5 for some wastes generated by formulators. These tables are not comprehensive lists. If you suspect that you generate a hazardous waste that is not on this list, contact your state hazardous waste management agency or EPA Regional office for assistance.

Waste Minimization

An effective waste minimization program can reduce the costs, liabilities, and regulatory burdens of hazardous waste management, while potentially enhancing efficiency, product quality, and community relations. Waste minimization techniques that can help you reduce the amount of hazardous waste that you generate include:

- Production planning and sequencing
- Process/equipment adjustment or modification
- Raw material substitution
- Loss prevention and housekeeping
- Waste segregation and separation
- Recycling.

Training and supervision of employees implementing waste minimization techniques is an important part of your successful program. Call the RCRA/Superfund Hotline toll-free at 800-424-9346 (or TDD 800-553-7672 for the hearing-impaired) for waste minimization information and publications.

Table 1

Typical Formulators Operations: Materials Used and Hazardous Wastes that Might be Generated

Process/ Operation	Materials Used	General Types of Waste Generated
Printing Ink Formulation	Coloring materials, resins, varnishes, solvents, driers, antioxidants, thickeners, gellants, waxes, defoamers, wetting agents, surfactants	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Ink — sludges with chromium or lead Solvent wastes Other toxic wastes
Pesticide and Agricultural Chemical Formulation	Pesticides, solvents, organic chemicals, heavy metals	Pesticide wastes Empty containers Rinsewater Solvent wastes Toxic wastes
Pharmaceutical Preparations Formulation	Solvents, resins, lubricants, gelatins	Solvent wastes Ignitable wastes Toxic wastewaters and wastewater treatment sludges
Paint and Coatings Formulation	Paints, solvents, heavy metals, acids/alkalies, driers, plastic resins, plasticizers	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Other toxic wastes Paint wastes Solvent wastes Spoiled batches
Chemical Product Formulation not Classified Elsewhere	Solvents, chemicals, catalysts, acids/alkalies, heavy metals	Acid/alkaline wastes Toxic heavy metal wastes (dust and sludge) Other toxic wastes Ignitable wastes Reactive wastes Solvent wastes Spent catalysts Emission control dusts and sludges

Table 2

Printing Ink Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
STRONG ALKALINE WASTES				
Ammonium Hydroxide	Ammonium Hydroxide, NH_4OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia	ORM-A	NA2672
SPENT SOLVENTS, SOLVENT STILL BOTTOMS, AND IGNITABLE TOXIC WASTES CONTAINING:				
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid[2]	UN1114
Acetone	Acetone	Waste Acetone	Flammable Liquid	UN1090
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Methyl Ethyl Ketone*	Methyl acetone, Meetco, Butanone, MEK, 2-butanone	Waste Methyl Ethyl Ketone	Flammable Liquid	UN1193
Xylene	Xylene, Xylol	Waste Xylene (Xylol)	Flammable Liquid	UN1307
Ethyl Acetate	Ethyl Acetate	Waste Ethyl Acetate	Flammable Liquid	UN1173
n-Butyl Acetate	Butyl Acetate	Waste n-Butyl Acetate	Flammable Liquid	UN1123
Isopropyl Acetate	Isopropyl Acetate	Waste Isopropyl Acetate	Flammable Liquid	UN1220

Table 2 (continued)

Printing Ink Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Glycol Ethers	May include numerous compounds including diethylene glycol and hexylene glycol	Waste Combustible Liquid, NOS[3]	Combustible Liquid[4]	NA1993
Ethyl Alcohol	Ethanol	Waste Ethyl Alcohol	Flammable Liquid	NA1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Propyl Alcohol	Propanol	Waste Propyl Alcohol	Flammable Liquid	UN1274
Hexane	Hexane	Waste Hexane	Flammable Liquid	UN1208
Heptane	Heptane	Waste Heptane	Flammable Liquid	UN1206
Naphtha	Mineral Spirits, VM&P Naphtha, White Spirits	Waste Naphtha	Combustible Liquid	UN2553
Chlorobenzene*	Chlorobenzene, Monochlorobenzene, Phenylchloride	Waste Chlorobenzene	Flammable Liquid	UN1134
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Cresols*	o-Cresol, m-Cresol, p-Cresol, (m,p)-Cresol, (o,m,p)-Cresol	Waste Cresol	Corrosive Material	UN2076
HEAVY METAL SOLUTIONS				
Heavy Metal Solutions	Aqueous washing solutions from ink formulation, ink tub washwater	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
INK SLUDGE				
Ink Sludge Containing Chromium or Lead	Organic Heavy Metal Sludges	Hazardous Waste, Liquid, NOS	ORM-E	NA9189
OTHER WASTES				
Ignitable Wastes, NOS		Waste Flammable Liquid, NOS Waste Flammable Solid, NOS Waste Combustible Liquid, NOS	Flammable Liquid Flammable Solid Combustible Liquid	UN1993 UN1325 NA1993
Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA categories of hazardous waste.

2 A flammable liquid has a flash point below 100°F.

3 NOS - Not otherwise specified.

4 A combustible liquid has a flash point between 100°F and 200°F.

Table 3

Pesticide and Agricultural Chemical Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
PESTICIDES CONTAINING ARSENIC*				
Arsenic pentoxide	Arsenic Acid Anhydrice, Arsenic (v) Oxide	Waste Arsenic Pentoxide, Solid	Poison B	UN1559
Arsenic trioxide	Arsenic Sesquioxide, Arsenic (III) Oxide, Arsenous Acid (anhydride), White Arsenic	Waste Arsenic Trioxide, Solid	Poison B	UN1561
Cacodylic acid	Hydroxydimethylarsine Oxide, Dimethylarsinic Acid, Phytar	Waste Arsenical Pesticide, Solid, NOS[2] Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid[3]	UN2759 UN2759 UN2760
Monosodium methanearsonate	MSMA, Ansar 170 H.C. and 529 H.C., Arsanote Liquid, Bueno 6, Daconate 6, Dal-E-Rad, Herb-All, Merge 823, Mesamate, Monate, Tans-Vert, Weed-E-Rad, Weed-Hoe	Waste Arsenical Pesticide, Solid, NOS Waste Arsenical Pesticide, Liquid, NOS Waste Arsenical Pesticide, Liquid, NOS	Poison B Poison B Flammable Liquid	UN2759 UN2759 UN2760

Table 3 (continued)

Pesticide and Agricultural Chemical Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Disodium monomethanearsonate	DSMA, Ansar 8100, Arrhenal, Arsinyl, Dinate, Di-Tac, DMA, Methar 30, Sodar, Versar DSMA- LQ, Weed-E-RAD 360	Waste Arsenical Pesticide, Solid, NOS	Poison B	UN2759
		Waste Arsenical Pesticide, Liquid, NOS	Poison B	UN2759
		Waste Arsenical Pesticide, Liquid, NOS	Flammable Liquid	UN2760
PESTICIDES CONTAINING CARBAMATES				
Temik	Aldicarb, OMS 771, UC 21149	Waste Carbamate Pesticide, Solid, NOS	Poison B	UN2757
		Waste Carbamate Pesticide, Liquid, NOS	Poison B	UN2757
		Waste Carbamate Pesticide, Liquid, NOS	Flammable Liquid	UN2758
PESTICIDES CONTAINING MERCURY*				
2-Methoxyethylmercuric chloride	MEMC, Agallol, Cekusil Universal-C, Ceresan-Universal-Nassbeize, Emisan 6	Waste Mercury Based Pesticide, Solid, NOS	Poison B	UN2777
		Waste Mercury Based Pesticide, Liquid, NOS	Poison B	UN2777
		Waste Mercury Based Pesticide, Liquid, NOS	Flammable Liquid	UN2778
Phenylmercuric acetate	PMA, PMAS, Agrosan, Cekusil, Celmer, Gallotox, Hong Nien, Liquiphene, Mersolite, Pamisan, Phix, Seedtox, Shimmer-ex. Tag HL 331	Waste Mercury Based Pesticide, Solid, NOS	Poison B	UN2777
		Waste Mercury Based Pesticide, Liquid, NOS	Poison B	UN2777
		Waste Mercury Based Pesticide, Liquid, NOS	Flammable Liquid	UN2778
PESTICIDES CONTAINING NICOTINE				
Nicotine	Black Leaf 40	Waste Poison B, Solid, NOS	Poison B	UN2811
		Waste Poison B, Liquid, NOS	Poison B	UN2810
		Waste Flammable Liquid, Poisonous, NOS	Flammable Liquid	UN1992
PESTICIDES CONTAINING SUBSTITUTED NITROPHENOLS				
Dinitrocresol	DNC, DNOC, Chemsect, Detal, Elgetol 30, Nitador, Selinin, Sinox, Trifocide, Trifrina	Waste Substituted Nitrophenol Pesticide, Solid, NOS	Poison B	UN2779
				UN2779
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Poison B	UN2780
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS	Flammable Liquid	
Dinoseb	DNBP, Basanite, Caldon, Chemox General, Chemox PE, Dinitro, Dinitro General, Dynamite, Elgetol 318, Gebutox, Hel-Fire, Nitropone C. Premerge 3, Sinox General, Subitex, Vertac General Weed Killer, Vertac Selective Weed Killer	Waste Substituted Nitrophenol Pesticide, Solid, NOS	Flammable Liquid	UN2780
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS		
		Waste Substituted Nitrophenol Pesticide, Liquid, NOS		
ORGANOPHOSPHATE PESTICIDES				
Dimethoate	AC-12880, Bi 58 EC, Cekuthoate, Cygon, Daphene, De-Fend, Demos-L40, Devigon, Dimet, Dimethogen, Perfekthion, Rebelate, Rogodial, Rogor, Roxion, Trimetion	Waste Organophosphorus Pesticide, Solid, NOS	Poison B	UN2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Poison B	UN2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Disulfoton	BAY 19639 and S276, Dithiodemeton, Dithiosystox, Di-Syston, Ethylthiodemeton, Frumin AL, M-74, Solvirex, Thiodemeton	Waste Disulfoton	Poison B	NA2783
		Waste Disulfoton Mixture, Dry	Poison B	NA2783
		Waste Disulfoton Mixture, Liquid	Poison B	NA2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Famphur	Bash, Bo-Ana, Dovip, Famfos, Warbex	Waste Organophosphorus Pesticide, Solid, NOS	Poison B	UN2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Poison B	UN2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Methyl Parathion	Cekumethion, E-601, Devithion, Folidol M, Fosferno M50, Gearphos, Metacide, Metaphos, Nitrox 80, Parataf, Paratox, Partron M, Penncap-M, Wofatox	Waste Methyl Parathion, Liquid	Poison B	NA 2783
		Waste Methyl Parathion Mixture, Dry	Poison B	NA2783
		Waste Methyl Parathion Mixture, Liquid (containing 25% or less methyl parathion)	Poison B	NA2783
		Waste Methyl Parathion Mixture, Liquid (containing more than 25% methyl parathion)	Poison B	NA2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784
Parathion	AC-3422, Alkron, Alleron, Aphamite, Bladan, Corothion, E-605, ENT 15108, Ethyl Parathion, Etilon, Folidol E-605, Fosterno 50, Niran, Orthophos, Panthion, Paramar, Paraphos, Parathene, Parawet, Phoskil, Rhodiatox, Soprathion, Station, Thiophos	Waste Parathion, Liquid	Poison B	NA2783
		Waste Parathion Mixture, Dry	Poison B	NA2783
		Waste Parathion Mixture, Liquid	Poison B	NA2783
		Waste Organophosphorus Pesticide, Liquid, NOS	Flammable Liquid	UN2784

Table 3 (continued)

Pesticide and Agricultural Chemical Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
STRYCHNINE PESTICIDES				
Strychnine	Strychnine Salts	Waste Strychnine, Solid	Poison B	UN1692
		Waste Strychnine Salt, Solid	Poison B	UN1692
THALLIUM SULFATE PESTICIDES				
Thallium Sulfate	Thallous Sulfate, Ratox, Zelio	Waste Thallium Sulfate, Solid	Poison B	NA1707
		Waste Flammable Liquid, Poisonous, NOS	Flammable Liquid	UN1992
TRIAZINE PESTICIDES				
Amitrole	Amerol, Amino Triazol Weedkiller 90, Amizol, AT-90, AT Liquid, Azolan, Azole, Cytrol, Diurol, Farmco, Herbizole, Simazol, Weedazol, Weedazol TL	Waste Triazine Pesticide, Solid, NOS	Poison B	UN2763
		Waste Triazine Pesticide, Liquid, NOS	Poison B	UN2763
		Waste Triazine Pesticide, Liquid, NOS	Flammable Liquid	UN2764
PHENOXY PESTICIDES				
2,4-D*	Amoxone, Brush Killer, Brush Rhap, Chloroxone, Crop Rider, D50, DMA 4, Dacamine, Ded- Weed, Desormone, Dinoxol, Emulsamine BK and E3, Envert DT and 171, Hedonal, Miracle, Pennamine D, Rhodia, Salvo, Super D-Weedone, Verton, Visko-Rhap, Weed Tox, Wee-B-Gone, Weed-Rhap, Weedar, Weedone, Weedtrol	Waste 2,4-Dichlorophenoxyacetic Acid	ORM-A	NA2765
		Waste 2,4-Dichlorophenoxyacetic Ester	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766
2,4,5-T	Brush-Rhap, Dacamine, Ded-Weedon, Esteron, Farmco Fence Rider, Forron, Inverton 245, Line Rider, Super D Weedone, Tormona, Transamine, U 46, Veon 245, Weedar, Weedone	Waste 2,4,5-Trichlorophenoxyacetic Acid	ORM-A	NA2765
		Waste 2,4,5-Trichlorophenoxyacetic Acid (amine, ester, or salt)	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766
Silvex*	2,4,5-Fenoprop, AquaVex, Double Strength, Fruitone T, Kuron, Kurosal, Silvi-Rhap, Weed-B-Gone	Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid	ORM-A	NA2765
		Waste 2-(2,4,5-Trichlorophenoxy) propionic Acid Ester	ORM-E	NA2765
		Waste Phenoxy Pesticide, Liquid, NOS	Flammable Liquid	UN2766
ORGANOCHLORINE PESTICIDES				
Aldrin	HHDN, Aldrex 30, Aldrite, Aldrosol, Altox, Drinox, Octalene, Seedrin Liquid	Waste Aldrin	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with more than 65% Aldrin)	Poison B	NA2761
		Waste Aldrin Mixture, Dry (with 65% or less Aldrin)	ORM-A	NA2761
		Waste Aldrin Mixture, Liquid (with more than 60% Aldrin)	Poison B	NA2762
		Waste Aldrin Mixture, Liquid (with 60% or less Aldrin)	ORM-A	NA2762
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Chlordane*	Belt, Chlordan, ChlorKil, Chlortox, Corodane, Gold Crest C-100, Kypchlor, Vesicol 1068, Topiclor 20, Niran, Octachlor, Octa-Klor, Ortho-Klor, Synklor, Termi-Ded	Waste Chlordane, Liquid	Flammable Liquid	NA2762
		Waste Chlordane, Liquid	Combustible Liquid[4]	NA2762
DDT	Dedelo, Didimic, Digmar, Genitox, Gyron, Hildit, Kopsol, Neocid, Pentachlorin, Rukseam, Zerdane	Waste DDT	ORM-A	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Dichloropropene	1,3-Dichloropropene, Telone II Soil Fumigant	Waste Dichloropropene	Flammable Liquid	UN2047
Dieldrin	Dieldrex, Dieldrite, Octalox, Panoram D-31	Waste Dieldrin	ORM-A	NA2761
		Waste Organochloride Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endrin*	Endrex, Hexadrin	Waste Endrin	Poison B	NA2761
		Waste Endrin Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762
Endosulfan	Beosit, Chlorthiepin, Crisulfan, Cyclodan, Endocel, EnSure, FMC 5462, Hildan, Hoe 2671, Malix, Thifor, Thimul, Thiodan, Thiofor, Thionex, Thiovel	Waste Endosulfan	Poison B	NA2761
		Waste Endosulfan Mixture, Liquid	Poison B	NA2761
		Waste Organochlorine Pesticide, Liquid, NOS	Flammable Liquid	UN2762

Table 3 (continued)

Pesticide and Agricultural Chemical Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Heptachlor*	Gold Crest H-60, Drinox H-34, Heptamul, Heptox	Waste Heptachlor Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Flammable Liquid	NA2761 UN2762
Kepone	Chlordecone, GC 1189	Waste Kepone Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Flammable Liquid	NA2761 UN2762
Lindane*	Exgama, Forlin, Gallogama, Gamaphex, Gammex, Inexit, Isotox, Lindafor, Lindagam, Lindagrain, Lindagranox, Lindalo, Lindamul, Lindapourdre, Lindaterra, Novigam, Silvanol	Waste Lindane Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
Methoxychlor	Flo Pro MeSeed Protectant, Marlate	Waste Methoxychlor Waste Organochlorine Pesticide, Solid, NOS Waste Organochlorine Pesticide, Liquid, NOS Waste Organochlorine Pesticide, Liquid, NOS	ORM-E Poison B Poison B Flammable Liquid	NA2761 UN2701 UN2761 UN2762
Propylene Dichloride	1,2-Dichloropropane	Waste Propylene Dichloride	Flammable Liquid	UN1279
Toxaphene*	Attac 4-2, 4-4, 6, 6-3, 8, Camphochlor, Motox, Phenacide, Phenatox, Strobane T-90, Toxakil, Toxon 63	Waste Toxaphene Waste Organochlorine Pesticide, Liquid, NOS	ORM-A Flammable Liquid	NA2761 UN2762
OTHER PESTICIDES				
Thiram	TMTD, AAtack, Arasan, Aules, Evershield T Seed Protectant, Fermide 850, Fernasan, Flo Pro T Seed Protectant, Hexathir, Mercuram, Nomersan, Pomarsolforte, Polyram-Ultra, Spotrete-F, Tetrapom, Thimer, Thioknock, Thiotex, Thiramad, Thirasan, Thiuramin, Tirampa, Trametan, Tripomol, Thylate, Tuads, Vancide TM	Waste Thiram Waste Flammable Liquid, Poisonous, NOS	ORM-A Flammable Liquid	NA2771 UN1992
Warfarin	Co-Rax, Cov-R-Tox, Kypfarin, Liqua-Tox, RAX, Rodex, Rodex Blox, Tox-Hid	Hazardous Waste, Solid NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Pentachlorophenol*	PCP, Penta, Penchlorol, Pentacon, Penwar, Sinituho, Santophen	Waste Pentachlorophenol Waste Flammable Liquid Waste Combustible Liquid	ORM-E Flammable Liquid Combustible Liquid	NA2020 UN1993 NA1993
Pentachloronitrobenzene	PCNB, Avicol, Botrilex, Brassicol, Earthcide, Folosan, Kobu, Pentagen, Saniclor 30, Terraclor, Tilcarex, Tritisan	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
Hexachlorobenzene*	Perchlorobenzene, Anticarie, Ceku C.B., HCB, No Bunt	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
1,2-Dibromo 3-chloropropane	DBCP, Nemafume, Nemanox, Nemaset, Nematocide	Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	ORM-E ORM-E Flammable Liquid Combustible Liquid	NA9189 NA9189 UN1993 NA1993
IGNITABLE AND/OR TOXIC SOLVENTS USED IN PESTICIDES				
Methyl Alcohol	Methanol	Waste Methyl Alcohol	Flammable Liquid	UN1230
Ethyl Alcohol	Ethanol, Alcohol	Waste Ethyl Alcohol	Flammable Liquid	UN1170
Isopropyl Alcohol	Isopropanol	Waste Isopropanol	Flammable Liquid	UN1219
Toluene	Methyl Benzene, Toluol	Waste Toluene, (toluol)	Flammable Liquid	UN1294
Xylene	Dimethylbenzene, Xylol	Waste Xylene (xylol)	Flammable Liquid	UN1307
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Benzene*	Benzol	Waste Benzene (Benzol)	Flammable Liquid	UN1114

Table 3 (continued)

Pesticide and Agricultural Chemical Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Tetrachloroethylene*	Perc, Perclene, Tetralex, Nema, Tetracap, Persec, Antisal 1, Perawin, Didakene	Waste Tetrachloroethylene	ORM-A	UN1897
Solvent Mixtures		Waste Combustible Liquid, NOS (flash point between 100°F and 200°F)	Combustible Liquid	NA1993
		Waste Flammable Liquid, NOS (flash point less than 100°F)	Flammable Liquid	UN1993
OTHER WASTES				
Ignitable Wastes, NOS		Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
		Waste Combustible Liquid, NOS	Combustible Liquid	NA1993
Hazardous Waste		Hazardous Waste, Liquid or Solid, NOS	ORM-E	UN9189

* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 NOS - Not otherwise specified.

3 A flammable liquid has a flash point below 100°F.

4 A combustible liquid has a flash point between 100°F and 200°F.

Table 4

Pharmaceutical Preparations Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
SPENT SOLVENTS, STILL BOTTOMS, AND OTHER IGNITABLE TOXIC WASTES CONTAINING:				
Acetone	Acetone	Waste Acetone	Flammable Liquid[2]	UN1090
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Chloroform*	Chloroform	Waste Chloroform	ORM-A	UN1888
Carbon Tetrachloride*	Perchloromethane, Tetraform, Carbona, Halon 104	Waste Carbon Tetrachloride	ORM-A	UN1846
Phenol*	Phenol	Waste Phenol	Poison B	UN1671
Toluene				
OTHER WASTES				
Ignitable Waste, NOS[3]	Ignitable Wastes, NOS	Waste Flammable Liquid, NOS	Flammable Liquid	UN1993
		Waste Combustible Liquid, NOS	Combustible Liquid[4]	NA1993
		Waste Flammable Solid, NOS	Flammable Solid	UN1325
Hazardous Waste		Hazardous Waste, NOS	ORM-E	UN9189

* Toxicity Characteristic constituent. Any waste that results in a TCLP extract containing a Toxicity Characteristic constituent equal to or above regulatory levels is hazardous.

1 These descriptions may change given variations in waste characteristics or conditions. Note that the DOT shipping name, hazard class, and UN/NA ID number do not directly correspond to RCRA hazardous waste categories.

2 A flammable liquid has a flash point below 100°F.

3 NOS - Not otherwise specified.

4 A combustible liquid has a flash point between 100°F and 200°F.

Table 5

Other Chemical Product Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
STRONG ACID/ALKALINE WASTES				
Ammonium Hydroxide	Ammonium Hydroxide, NH_4OH, Spirit of Hartshorn, Aqua Ammonia	Waste Ammonium Hydroxide (containing not less than 12% but not more than 44% ammonia)	Corrosive Material	NA2672
		(containing less than 12% ammonia)	ORM-A	NA2672
Hydrobromic Acid	Hydrobromic Acid, HBr	Waste Hydrobromic Acid	Corrosive Material	UN1788
Hydrochloric Acid	Hydrochloric Acid, HCl, Muriatic Acid	Waste Hydrochloric Acid	Corrosive Material	NA1789

Table 5 (continued)

Other Chemical Product Formulators Waste Descriptions[1]

Waste Type	Designations/Trade Names	DOT Shipping Name	Hazard Class	UN/NA ID Number
Hydrofluoric Acid	Hydrofluoric Acid, HF, Fluorohydric Acid	Waste Hydrofluoric Acid	Corrosive Material	UN1790
Nitric Acid	Nitric Acid, $HN0_2$, Aquafortis	Waste Nitric Acid (over 40%)	Oxidizer	UN2031
		(40% or less)	Corrosive Material	NA1760
Phosphoric Acid	Phosphoric Acid, H_3P0_4, Orthophosphoric Acid	Waste Phosphoric Acid	Corrosive Material	UN1805
Potassium Hydroxide	Potassium Hydroxide, KOH, Potassium Hydrate, Caustic Potash, Potassa	Waste Potassium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1814 UN1813
Sodium Hydroxide	Sodium Hydroxide NaOH, Caustic Soda, Soda Lye, Sodium Hydrate	Waste Sodium Hydroxide Solution Dry Solid, Flake, Bead, or Granular	Corrosive Material Corrosive Material	UN1824 UN1823
Sulfuric Acid	Sulfuric Acid, H_2SO_4, Oil of Vitriol	Waste Sulfuric Acid	Corrosive Material	UN1832
Chromic Acid	Chromic Acid	Waste Chromic Acid Solution	Corrosive Material	UN1755
SPENT SOLVENTS, STILL BOTTOMS, AND OTHER IGNITABLE OR TOXIC WASTES CONTAINING:				
Acetone	Acetone	Waste Acetone	Flammable Liquid[2]	UN1090
Benzene*	Benzene	Waste Benzene (Benzol)	Flammable Liquid	UN1114
Methylene Chloride*	Dichloromethane, Methane Dichloride, Methylene Bichloride, NCI-C50102, Solaesthin, Aerothene, Narkotil, Solmethine	Waste Dichloromethane or Methylene Chloride	ORM-A	UN1593
Toluene	Toluene, Methacide, Methylbenzene, Methylbenzol, Phenylmethane, Toluol, Antisal 1A	Waste Toluene (Toluol)	Flammable Liquid	UN1294
Trichloroethylene*	TCE, Perm-A-Clor, Landain, Lethurin, Nialk, Triklene, Algylen, Trielin, Chlorylene, Dow-Tri	Waste Trichloroethylene	ORM-A	UN1710
Xylene	Xylene, Xylol	Waste Xylene (Xylol)	Flammable Liquid	UN1307
OTHER REACTIVE WASTES				
Hypochlorites	Sodium Hypochlorite, NaOCl Hypochlorous Acid, Cloros, Dazzle, Antiformin	Waste Hypochlorite Solution (more than 7% chlorine) Waste Hypochlorite Solution (not more than 7% chlorine)	Corrosive Material ORM-B	UN1791 NA1791
Organic Peroxides	Organic Peroxide	Waste Organic Peroxide, Liquid or Solution, NOS[3]	Organic Peroxide Flammable Liquid	NA9183 NA1993
Perchlorates	Irenat, Periodin, Perchlorocap	Waste Sodium Perchlorate Waste Potassium Perchlorate Waste Perchlorate, NOS	Oxidizer Oxidizer Oxidizer	UN1502 UN1498 NA1481
Permanganates	Permanganic Acid, Potassium Salt, Chameleon Mineral	Waste Potassium Permanganate Waste Sodium Permanganate Waste Permanganate, NOS	Oxidizer	UN1490 UN1503 NA1482
Sulfides	Potassium Monosulfide, K_2S, Sodium Sulfuret, Na_2S	Waste Potassium Sulfide Waste Sodium Sulfide, Anhydrous	Flammable Solid Flammable Solid	UN1382 UN1385
OTHER IGNITABLE OR TOXIC WASTES				
Ignitable Wastes NOS	Ignitable Wastes	Waste Flammable Liquid, NOS Waste Combustible Liquid, NOS	Flammable Liquid Combustible Liquid[4]	UN1993 NA1993
Hazardous Wastes NOS	Hazardous Wastes	Waste Flammable Solid, NOS Hazardous Waste, Solid, NOS Hazardous Waste, Liquid, NOS	Flammable Solid ORM-E ORM-E	UN1325 NA9189 NA9189

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For further information call the RCRA/Superfund Hotline 1-800-424-9346