Guide to Laboratory Sink/Sewer Disposal of Wastes

EPA Compliance Fact Sheet: Revision 1

Vanderbilt Environmental Health and Safety
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INTRODUCTION

Vanderbilt University is required to comply with sewer disposal restrictions established by the Metro wastewater treatment plant and all applicable State and Federal regulations. This guide is designed to assist laboratories with the identification of waste streams that are prohibited or limited from sink/sewer disposal. Wastes must **NOT** be intentionally diluted to comply with sink/sewer disposal requirements. Please note that application of some regulatory requirements to laboratory waste streams is extremely complicated. Contact the Vanderbilt Environmental Health and Safety Department (VEHS) for assistance in applying these guidelines to your specific waste streams. For more information on how to collect and manage hazardous wastes, contact VEHS.

WASTES FORBIDDEN FROM SINK/SEWER DISPOSAL

The following wastes must **NEVER** be discharged to the sanitary sewer in **ANY** concentration. These wastes must be collected and managed as hazardous waste.

1. **Raw Chemical Waste.**
   Unused, pure, or concentrated chemicals.

2. **Chlorinated Hydrocarbon Waste.**
   Chlorinated hydrocarbons are compounds that contain chlorine, hydrogen, and carbon. Examples of chlorinated hydrocarbons include but are not limited to:
   a. Chloromethanes:
      Specific examples:
      Methylene chloride
      Trichloromethane (chloroform)
      Trichlorofluoromethane
   b. Chloroethanes:
      Specific examples:
      1,1-Dichloroethane
      1,1,1-Trichloroethane
      1,1,2-Trichloroethane
      Hexachloroethane
   c. Chloroethylenes:
      Specific examples:
      Vinyl chloride
      Trichloroethylene
      Tetrachloroethylene
   d. Chloropropanes, chlorobutanes, chlorobutenes:
      Specific examples:
      Dichlorobutadiene
      Hexachlorobutadiene
   e. Chlorinated paraffins;

f. Chlorinated pesticides
Specific examples:

Aldrin	Heptachlor epoxide
Chlordane	Hexachloride
DDT	Hexachlorobenzene
2,4-D	Lindane
Dieldrin	Methoxychlor
Endrin	Mirex
Heptachlor	Toxaphene

g. Nucleus-chlorinated aromatic hydrocarbons
Specific examples:
Dichlorobenzene
Dichlorotoluene
Chlorobenzene
1,2-Dichlorobenzene
1,4-Dichlorobenzene
Chlorinated biphenyls (including PCBs)
Chlorinated naphthalenes
Pentachlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol

h. Side-chain chlorinated aromatic hydrocarbons
Specific examples:
Chloromethyl benzene (benzyl chloride)
Dichloromethyl benzene (benzal chloride)
Trichloromethyl benzene (benzotrichloride).

3. **Chlorofluorcarbon Waste.**

4. **Brominated Hydrocarbon Waste.**
Specific examples:
Bromoform
Bromomethane

5. **Cyanide Waste.**
Includes cyanide, cyanate (OCN-), and thiocyanate (SCN-) compounds.
Specific examples:
Potassium cyanide
Sodium cyanide
Hydrogen cyanide
Zinc cyanide
Copper cyanide
Nickel cyanide.

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6. **Heavy Metal Waste.**
   Specific examples:

Antimony	Mercury
Arsenic	Nickel
Barium	Selenium
Cadmium	Silver
Chromium	Thallium
Copper	Zinc
Lead	

7. **Corrosive Waste.**
   Corrosive wastes are wastes that could cause corrosive structural damage to the sink/sewer piping. All wastes with a pH lower than 5.0 Standard Units (S.U.) or higher than 9.0 S.U. are considered corrosive wastes. Laboratories must not neutralize corrosive wastes to comply with this requirement unless it is part of a written protocol for the laboratory process generating the waste and the neutralization process is carried out by trained, qualified personnel.

8. **Solvent Waste.**
   Wastes containing any of the following solvents in any concentration:

Acetone	Ethyl Ether
Benzene	Isobutanol
n-Butyl Alcohol	Methanol
Carbon Disulfide	Methyl Ethyl Ketone (MEK)
Carbon Tetrachloride	Methyl Isobutyl Ketone
Cresols	Nitrobenzene
Cyclohexanone	2-Nitropropane
Cresylic Acid	Pyridine
2-Ethoxyethanol	Toluene
Ethyl Acetate	Xylene
Ethyl Benzene	

   Please note that acetone used to wash glassware falls into this category.

9. **Oil and Grease Wastes.**
   Waste oils and grease, including vacuum pump oil, must be collected and managed as hazardous wastes. Wastes that are contaminated with oil or grease in concentrations greater than 50 mg/L must also be collected and managed as hazardous waste.

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10. **Ignitable Wastes.**
Ignitable wastes are: 1) Liquid wastes with a flashpoint less than 60 ^{o}C (140 ^{o}F); 2) Non-liquid wastes that are capable of causing fire through friction, reaction with moisture, or spontaneous chemical changes; 3) Ignitable compressed gases; or 4) Oxidizers. Ignitable wastes include most waste solvents found in laboratories, ignitable compressed gases such as hydrogen, and oxidizers such as nitrates/nitrites (sodium nitrate, potassium nitrite, etc.) and chlorates and perchlorates (magnesium perchlorate, etc.). Ignitable wastes include mixtures of ignitable chemicals with other materials if the mixture still exhibits the ignitability characteristic (i.e., flashpoint less than 60 ^{o}C).

11. **Reactive Wastes.**
Reactive wastes: 1) Are normally unstable and readily undergo violent change; 2) React violently or form explosive mixtures with water; 3) Can generate toxic gases, vapors or fumes when mixed with water or exposed to extreme pH conditions; or 4) Are capable of detonation or explosive reaction under certain conditions. Common reactive wastes found in laboratories include certain cyanides, sulfides, and silanes or any mixtures of multiple wastes that exhibit reactivity characteristics.

12. **Solid or Viscous Wastes.**
Solid or viscous wastes that may coat, clog, or otherwise cause obstruction to the flow of sewer pipes must never be discharged to the sewer. Examples of prohibited solid or viscous waste include sand, animal tissues, bones, plastics, rubber, glass, wood chips, wood shavings, plaster, paint, etc. in such quantity, concentration, or form that may cause interference with proper sewer flow. Depending on the nature of the waste, it may be discharged to the normal trash or collected and managed as hazardous waste.

13. **Nuisance Waste.**
Wastes that may cause a discoloration or that may cause interference in the Metro wastewater treatment plant must not be discharged to the sewer. Wastes that are noxious or malodorous to the extent that a nuisance may be created at the Metro wastewater treatment plant or in other laboratories must not be discharged to the sewer.

14. **Untreatable Waste.**
Wastes that contain any element or compound that cannot be adequately treated or removed by the Metro wastewater treatment plant (biological activated sludge treatment) and that is known to be an environmental hazard must not be discharged to the sewer.

15. **Hot Liquid or Vapor Wastes.**
Liquid or vapor wastes with a temperature above 65.5 ^{o}C (150 ^{o}F) must not be discharged to the sewer.

16. **Ethidium Bromide and Acrylamide Waste.**
Buffer solutions and other solutions containing ethidium bromide or acrylamide in any concentration and ethidium bromide and acrylamide gels.

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17. **Priority Pollutant Wastes.**

All wastes containing any of the following priority pollutant compounds in any concentration must be collected and managed as hazardous waste:

Volatiles		
Acrylonitrile	Benzene	Bromoform
Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane
Chloroethane	2-Chloroethylvinyl ether	Chloroform
Dichlorobromomethane	Dichlorodifluoromethane	1,1-Dichloroethane
1,2-Dichloroethane	1,1-Dichloroethylene	Dichloromethane
1,2-Dichloropropane	1,2-Dichloropropylene	1,3-Dichloropropylene
2,4-Dichloropropylene	Ethylbenzene	Methyl bromide
Methyl chloride	Methylene chloride	1,1,2,1-Tetrachloroethane
1,1,2,2-Tetrachloroethane	Tetrachloroethylene	Tetrachloromethane
Toluene	Trans-dichloroethylene	1,2-Trans-dichloroethylene
1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethylene
Trichlorofluoromethane	Trichloromethane	Vinyl chloride
Base/Neutral		
Acenaphthene	Acenaphthylene	Anthracene
Benzidine	Benzo(a)anthracene	Benzo(a)pyrene
3,4-Benzofluoranthene	Benzo(ghi)perylene	Benzo(b)fluoranthene
Benzo(k)fluoranthene	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether	Bis(2-chloromethyl)ether	Bis (2-ethylhexyl)phthalate
4-Bromophenyl phenyl ether	Butylbenzyl phthalate	2-Chloronaphthalene
4-Chlorophenyl phenyl ether	Chrysene	Dibenzo(a,h)anthracene
1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene
3,3'-Dichlorobenzidine	Di-n-ethyl phthalate	Diethyl phthalate
Di-c-methyl phthalate	Dimethyl phthalate	Di-n-butyl phthalate
2,4-Dinitrotoluene	2,6-Dinitrotoluene	Di-n-octyl phthalate
1,2-Diphenylhydrazine	Fluroranthene	Fluorene
Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene
Hexachloroethane	Indeno(1,2,3-cd)pyrene	Naphthalene
Nitrobenzene	N-nitrosodimethylamine	N-nitrosodi-n-propylamine
N-nitrosodiphenylamine	Phenanthrene	Pyrene
1,2,4-Trichlorobenzene		
Pesticides		
Acrolein	Aldrin	BHC, alpha
BHC, beta	BHC, delta	BHC, gamma
Chlordane	4,4'-DDT	4,4'-DDE
4,4'-DDD	Dieldrin	Endosulfan, alpha
Endosulfan, beta	Endosulfan sulfate	Endrin
Endrin aldehyde	Heptachlor	Heptachlor epoxide
Isophorone	PCB-1016	PCB-1221
PCB-1232	PCB-1242	PCB-1248
PCB-1254	PCB-1260	TCDD (Dioxin)
Toxaphene		

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Inorganics, Metals, Phenols, and Cresols		
Antimony	Arsenic	Asbestos
Beryllium	Cadmium	Chromium
Copper	Lead	Mercury
Nickel	Selenium	Silver
Thallium	Zinc	Cyanide
2-Chlorophenol	Cresols	2,4-Dichlorophenol
2,4-Dimethylphenol	4,6-Dinitro-o-cresol	2,4-Dinitrophenol
2-Nitrophenol	4-Nitrophenol	P-chloro-m-cresol
Pentachlorophenol	Phenols	2,4,6-Trichlorophenol

18. **Rinseate.**
Empty containers that are being rinsed should be triple rinsed with a minimal amount of liquid and the rinseate collected and managed as hazardous waste, if the container held any of the wastes described above in Sections 1, 2, 3, 4, 5, 6, or 8. Subsequent rinses may be discharged to the sewer. Depending on the waste, fewer rinses may be required to be collected. Contact VEHS for evaluation of specific waste containers. Rinseate from empty containers that held other types of waste may be discharged to the sewer if the rinseate does not exhibit the hazardous characteristic of the waste (for example, rinseate from a container that held ignitable waste may be sewer disposed if the rinseate is not ignitable).

WASTES WITH LIMITED SINK/SEWER DISPOSAL

1. **Radioactive Wastes.**
A radioactive waste that is water soluble or readily dispersible in water and not prohibited from sewer disposal based on the criteria described in the previous section may be disposed via the sanitary sewer system. The disposal limit is 200 µCi per laboratory per day. Records of sewer disposal must be maintained on the Radioactive Material Usage Log.

2. **Biological Materials.**
Biological waste must not be discharged to the sewer unless it has been properly treated. Please refer to Proper Disposal of Biological Waste in the Guide to Biosafety at Vanderbilt for biological waste disposal policies and procedures (VEHS website). Biological waste intended for sewer disposal must not be prohibited from sewer disposal based on the criteria described in the previous section.

3. **Specific Organic Chemicals in Concentrations of One Percent or Less.**
Organic chemicals suitable for sink/sewer disposal are described below. Only those organic compounds that are reasonably soluble in water are suitable for sink/sewer disposal. A compound is considered water soluble if it dissolves to the extent of at least three percent. Chemicals listed below must be in concentrations of approximately one percent or less to be suitable for sink/sewer disposal. If the total volume of waste to be disposed is greater than four liters per day, approval by VEHS is required. Sewer discharges of these chemicals must not be prohibited in the previous

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section. Any chemicals that fall into categories described below but are specifically prohibited from sink/sewer disposal in the previous section must NOT be discharged to the sewer.

a. Alkanols with 4 or fewer carbon atoms.
Specific examples:

2-Butanol	2-Propanol	Tert-butanol
Ethanol	1-Propanol	

b. Alkanediols with 7 or fewer carbon atoms.
Specific examples:

Butanediol and isomers	Butylene glycol
Ethylene glycol	Heptamethylene glycol
Heptanediol and isomers	Hexanediol and isomers
Hexylene glycol	Pentanediol and isomers
Pentylene glycol	Propylene glycol

c. Sugars and sugar alcohols (polyols).
Specific examples:

Dithioerythritol	Dithiothreitol	Erythritol
Glycerol	Lactitol	Maltitol
Mannitol	Molasses	Sorbitol
Xylitol		

d. Alkoxyalkanols with 6 or fewer carbon atoms.
Specific examples:
Butoxyethanol
Ethoxyethanol
Methoxyethanol

e. Aliphatic aldehydes with 4 or fewer carbon atoms.
Specific examples:
Acetaldehyde
Butyraldehyde (butanal)
Formaldehyde
Glutaraldehyde
Isobutyraldehyde
Propionaldehyde (propanal)

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f. $RCONH_2$ and RCONHR with 4 or fewer carbon atoms and $RCONR_2$ with 10 or fewer carbon atoms.
Specific examples:

Acetamide	Butanamide
Butyramide	Formamide
Isobutyramide	N,N-Diethyl formamide
N,N-Dimethyl acetamide	N,N-Dimethyl propionamide
N-Ethyl acetamide	N-Ethyl formamide
N-Methyl acetamide	N-Methyl formamide
N-Methyl propionamide	Propionamide

g. Aliphatic amines with 6 or fewer carbon atoms.
Specific examples:

Amylamine	Isobutylamine	Butylamine
Dimethylpropylamine	Ethylamine	1-Ethylpropylamine
Hexylamine	Isobutylamine	Isopropylamine
Methylamine	Methylbutylamine	N-Ethylbutylamine
N-Ethylmethylamine	N-Methylpropylamine	Trimethylamine
Iso-amylamine	Diethylamine	

h. Aliphatic diamines with 6 or fewer carbon atoms.
Specific examples:

Ethylene diamine	Hexamethylene diamine and isomers
Pentamethylenediamine and isomers	Piperazine
1,2-Propanediamine	1,3-Propanediamine
Triethylenediamine	

i. Alkanoic acids with 5 or fewer carbon atoms and the ammonium, sodium, and potassium salts of these acids with 20 or fewer carbon atoms.
Specific examples:

Acetic acid	Butyric acid	Formic acid
Isobutyric acid	Isovaleric acid	Propionic acid
Valeric acid		

j. Alkanedioic acids with 5 or fewer carbon atoms and the ammonium, sodium, and potassium salts of these acids with 20 or fewer carbon atoms.
Specific examples:

Fumaric acid	Glutaric acid (1,5-pentanedioic acid)
Malic acid	Malonic acid (1,3-propanedioic acid)
Oxalic acid (1,2-ethanedioic acid)	Succinic acid (1,4-butanedioic acid)
Tartaric acid	

k. Hydroxyalkanoic acids with 5 or fewer carbon atoms and the ammonium, sodium, and potassium salts of these acids with 20 or fewer carbon atoms.
Specific examples:
Glycolic acid
3-Hydroxybutyric acid
2-Hydroxyisobutyric acid
Lactic acid (2-hydroxypropanoic acid)

l. Aminoalkanoic acids with 6 or fewer carbon atoms and the ammonium, sodium, and potassium salts of these acids with 20 or fewer carbon atoms.
Specific examples:

3-Amino butyric acid	4-Amino butyric acid
Amino isobutyric acid	5-Amino pentanoic acid and isomers
3-Amino propanoic acid	

m. Esters with 4 or fewer carbon atoms.
Specific examples:

Ethyl formate	Isopropyl acetate	Isopropyl formate	Methyl acetate
Methyl formate	Methyl propionate	Propyl formate	

n. Nitriles.
Specific examples:
Acetonitrile
Butyronitrile
Isobutylnitrile
Propionitrile

o. Sulfonic acids and sodium and potassium salts of the acids.
Specific examples:

Methane sulfonic acid	Ethane sulfonic acid
1-Propane sulfonic acid	1-Butane sulfonic acid
1-Pentane sulfonic acid	1-Hexane sulfonic acid
1-Heptane sulfonic acid	1-Octane sulfonic acid
1-Decane sulfonic acid	1-Dodecane sulfonic acid
1-Tetradecane sulfonic acid	1-Hexadecane sulfonic acid

4. **Specific Inorganic Chemicals in Concentrations of One Percent or Less.**
Inorganic chemicals suitable for sink/sewer disposal are described below. Only those inorganic compounds that are reasonably soluble in water are suitable for sink/sewer disposal. A compound is considered water soluble if it dissolves to the extent of at least three percent. Chemicals listed below must be in concentrations of approximately one percent or less to be suitable for sink/sewer disposal. If the total volume of waste to be disposed is greater than four liters per day, approval by VEHS is required. Sewer discharges of these chemicals must not be prohibited in the previous section. Any chemicals that fall into categories described below but are specifically prohibited from sink/sewer disposal in the previous section must NOT be discharged to the sewer.

a. Inorganic salts for which both the cations and anions are listed in the following table.

Cations	Anions
Aluminum, Al^{3+}	Borate, BO_3^{3-}, $B_4O_7^{2-}$
Ammonium, NH^{4+}	Bromide, Br^-
Calcium, Ca^{2+}	Carbonate, CO_3^{2-}
Cesium, Cs^+	Chloride, Cl^-
Hydrogen, H^+	Bisulfite, HSO_3^-
Lithium, Li^+	Hydroxide, OH^-
Magnesium, Mg^{2+}	Oxide, O_2^-
Potassium, K^+	Iodide, I^-
Sodium, Na^+	Nitrate, NO_3^-
Strontium, Sr^{2+}	Phosphate, PO_4^{3-}
Tin, Sn^{2+}	Sulfate, SO_4^{2-}
Titanium, Ti^{3+}, Ti^{4+}	
Zirconium, Zr^{2+}	

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REFERENCES

1. Tennessee Department of Environment and Conservation (TDEC) Rule 1200-1-11.
2. Metropolitan Government of Nashville and Davidson County Code of Laws Title 15.60.
3. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, Washington, D.C., 1981.
4. Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, Washington, D.C., 1983.
5. Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Academy Press, Washington, D.C., 1995.

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SUMMARY OF SPECIFIC CHEMICALS FORBIDDEN FROM SEWER DISPOSAL

The following chemicals must not be discharged to the sanitary sewer in any concentration. This list contains examples of specific chemicals and does **NOT** include all chemicals that are forbidden from sewer disposal. For more information on whether a chemical not listed below can be discharged to the sewer, refer to the detailed sections in this guide or contact VEHS.

Specific Chemicals Forbidden from Sewer Disposal	
Acenaphthene	Acenaphthylene
Acetone	Acrolein
Acrylamide	Acrylonitrile
Aldrin	Anthracene
Antimony	Arsenic
Asbestos	Barium
Benzene	Benzidine
Benzo(a)anthracene	Benzo(a)pyrene
Benzo(b)fluoranthene	Benzo(ghi)perylene
3,4-Benzofluoranthene	Benzo(k)fluoranthene
Beryllium	BHC, alpha
BHC, beta	BHC, delta
BHC, gamma	Bis (2-ethylhexyl)phthalate
Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether	Bis(2-chloromethyl)ether
Bromoform	Bromoform
Bromomethane	4-Bromophenyl phenyl ether
Butylbenzyl phthalate	Cadmium
Carbon Disulfide	Carbon Tetrachloride
Chlordane	2-Chloroethylvinyl ether
Chlorinated biphenyls (including PCBs)	Chlorinated naphthalenes
Chlorobenzene	Chlorodibromomethane
Chloroethane	Chloroform
Chloromethyl benzene (benzyl chloride)	2-Chloronaphthalene
2-Chlorophenol	4-Chlorophenyl phenyl ether
Chromium	Chrysene
Copper	Copper cyanide
Cresols	Cresylic Acid
Cyanide	Cyclohexanone
2,4-D	DDT
4,4'-DDD	4,4'-DDE
4,4'-DDT	Dibenzo(a,h)anthracene
Dichlorobenzene	1,2-Dichlorobenzene
1,3-Dichlorobenzene	1,4-Dichlorobenzene

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Specific Chemicals Forbidden from Sewer Disposal	
3,3'-Dichlorobenzidine	Dichlorobromomethane
Dichlorobutadiene	Dichlorodifluoromethane
1,1-Dichloroethane	1,2-Dichloroethane
1,1-Dichloroethylene	1,2-Trans-dichloroethylene
Dichloromethane	Dichloromethyl benzene (benzal chloride)
2,4-Dichlorophenol	1,2-Dichloropropane
1,2-Dichloropropylene	1,3-Dichloropropylene
2,4-Dichloropropylene	Dichlorotoluene
Di-c-methyl phthalate	Dieldrin
Diethyl phthalate	2,4-Dimethylphenol
Dimethyl phthalate	2,4-Dinitrophenol
Di-n-butyl phthalate	Di-n-ethyl phthalate
Di-n-octyl phthalate	4,6-Dinitro-o-cresol
2,6-Dinitrotoluene	1,2-Diphenylhydrazine
Endosulfan sulfate	Endosulfan, alpha
Endosulfan, beta	Endrin
Endrin aldehyde	Ethidium Bromide
2-Ethoxyethanol	Ethyl Acetate
Ethyl Benzene	Ethyl Ether
Ethylbenzene	Fluorene
Fluroranthene	Heptachlor
Heptachlor epoxide	Hexachloride
Hexachlorobenzene	Hexachlorobutadiene
Hexachlorocyclopentadiene	Hexachloroethane
Hydrogen cyanide	Indeno(1,2,3-cd)pyrene
Isobutanol	Isophorone
Lead	Lindane
Mercury	Methanol
Methoxychlor	Methyl bromide
Methyl chloride	Methyl Ethyl Ketone (MEK)
Methyl Isobutyl Ketone	Methylene chloride
Mirex	Naphthalene
n-Butyl Alcohol	Nickel
Nickel cyanide	Nitrobenzene
2-Nitrophenol	4-Nitrophenol
2-Nitropropane	N-nitrosodimethylamine
N-nitrosodi-n-propylamine	N-nitrosodiphenylamine
PCB-1016	PCB-1221
PCB-1232	PCB-1242
PCB-1248	PCB-1254
PCB-1260	P-chloro-m-cresol

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Specific Chemicals Forbidden from Sewer Disposal	
Pentachlorophenol	Phenanthrene
Phenols	Potassium cyanide
Pyrene	Pyridine
Selenium	Silver
Sodium cyanide	TCDD (Dioxin)
1,1,2,1-Tetrachloroethane	1,1,2,2-Tetrachloroethane
Tetrachloroethylene	Tetrachloromethane
Thallium	Toluene
Toxaphene	Trans-dichloroethylene
1,2,4-Trichlorobenzene	1,1,1-Trichloroethane
1,1,2-Trichloroethane	Trichloroethylene
Trichlorofluoromethane	Trichloromethane (chloroform)
Trichloromethyl benzene (benzotrichloride)	2,4,5-Trichlorophenol
2,4,6-Trichlorophenol	Vinyl chloride
Xylene	Zinc
Zinc cyanide	

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SUMMARY OF SPECIFIC CHEMICALS WITH LIMITED SEWER DISPOSAL

The following chemicals may be discharged to the sewer in concentrations of approximately one percent or less. If the percentage is greater than one percent, approval by VEHS is required. If the total volume of waste to be disposed is greater than four liters per day, approval by VEHS is required. Sewer discharges of these chemicals must not be prohibited for any other reason. Specifically, solutions containing these chemicals must not also contain chemicals specifically forbidden from sewer disposal. This list contains examples of specific chemicals and does **NOT** include all chemicals with limited discharge to the sewer. For more information on whether a chemical not listed below can be discharged to the sewer, refer to the detailed sections in this guide or contact VEHS.

Specific Chemicals with Limited Sewer Disposal	
Acetaldehyde	Acetamide
Acetic acid	Acetonitrile
3-Amino butyric acid	4-Amino butyric acid
Amino isobutyric acid	5-Amino pentanoic acid and isomers
3-Amino propanoic acid	Amylamine
Butanamide	Butanediol and isomers
1-Butane sulfonic acid	2-Butanol
Butoxyethanol	Butylamine
Butylene glycol	Butyraldehyde (butanal)
Butyramide	Butyric acid
Butyronitrile	1-Decane sulfonic acid
Diethylamine	Dimethylpropylamine
Dimethyl sulfoxide (DMSO)	Dithioerythritol
Dithiothreitol	1-Dodecane sulfonic acid
Erythritol	Ethane sulfonic acid
Ethanol	Ethoxyethanol
Ethyl formate	Ethylamine
Ethylene diamine	Ethylene glycol
1-Ethylpropylamine	Formaldehyde
Formamide	Formic acid
Fumaric acid	Glutaraldehyde
Glutaric acid (1,5-pentanedioic acid)	Glycerol
Glycolic acid	Heptamethylene glycol
Heptanediol and isomers	1-Heptane sulfonic acid
1-Hexadecane sulfonic acid	Hexamethylene diamine and isomers
1-Hexane sulfonic acid	Hexanediol and isomers
Hexylamine	Hexylene glycol
3-Hydroxybutyric acid	2-Hydroxyisobutyric acid
Iso-amylamine	Isobutylamine
Isobutylamine	Isobutylnitrile
Isobutyraldehyde	Isobutyramide

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Specific Chemicals with Limited Sewer Disposal	
Isobutyric acid	Isopropyl acetate
Isopropyl formate	Isopropylamine
Isovaleric acid	Lactic acid (2-hydroxypropanoic acid)
Lactitol	Malic acid
Malonic acid (1,3-propanedioic acid)	Maltitol
Mannitol	Methane sulfonic acid
Methoxyethanol	Methyl acetate
Methyl formate	Methyl propionate
Methylamine	Methylbutylamine
Molasses	N,N-Diethyl formamide
N,N-Dimethyl acetamide	N,N-Dimethyl propionamide
N-Ethyl acetamide	N-Ethyl formamide
N-Ethylbutylamine	N-Ethylmethylamine
N-Methyl acetamide	N-Methyl formamide
N-Methyl propionamide	N-Methylpropylamine
1-Octane sulfonic acid	Oxalic acid (1,2-ethanedioic acid)
Pentamethylenediamine and isomers	Pentanediol and isomers
1-Pentane sulfonic acid	Pentylene glycol
Piperazine	1,2-Propanediamine
1,3-Propanediamine	1-Propane sulfonic acid
1-Propanol	2-Propanol
Propionaldehyde (propanal)	Propionamide
Propionic acid	Propionitrile
Propyl formate	Propylene glycol
Sorbitol	Succinic acid (1,4-butanedioic acid)
Tartaric acid	Tert-butanol
1-Tetradecane sulfonic acid	Triethylenediamine
Trimethylamine	Valeric acid
Xylitol	

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Inorganic salts for which both the cations and anions are listed in the following table.

Cations	Anions
Aluminum, Al^{3+}	Borate, BO_3^{3-}, $B_4O_7^{2-}$
Ammonium, NH^{4+}	Bromide, Br^-
Calcium, Ca^{2+}	Carbonate, CO_3^{2-}
Cesium, Cs^+	Chloride, Cl^-
Hydrogen, H^+	Bisulfite, HSO_3^-
Lithium, Li^+	Hydroxide, OH^-
Magnesium, Mg^{2+}	Oxide, O_2^-
Potassium, K^+	Iodide, I^-
Sodium, Na^+	Nitrate, NO_3^-
Strontium, Sr^{2+}	Phosphate, PO_4^{3-}
Tin, Sn^{2+}	Sulfate, SO_4^{2-}
Titanium, Ti^{3+}, Ti^{4+}	
Zirconium, Zr^{2+}	