## *Attachment C – Glossary of Chemicals (Section F.8)*

*This glossary is for general use and is not intended to be a complete or definitive reference. The parameters are categorized into Metals, Organonitrogen Compounds, Pesticides, Phenols, Phthalates, Polynuclear Aromatic Hydrocarbons, Volatile Organics, and Others and are listed alphabetically.*

*The information was obtained primarily from Environmental Protection Agency (EPA) Ambient Water Quality Criteria documents which are referenced in EPA's Quality Criteria for Water (EPA 440/5-86-001), updated May 1, 1987. Additional information was obtained from the EPA pamphlet "Suspended, Cancelled and Restricted Pesticides," January 1985; The Condensed Chemical Dictionary, 10th Ed. (Van Nostrand Reinhold Co., Inc., New York, 1981); and The Farm Chemicals Handbook (Meister Publishing Company, Willoughby, OH, 1988).*

*Information on organotins was obtained from the International Organotin Symposium held at Halifax, Nova Scotia in September 1987 and published in Volume 4 of the Oceans '87 Proceedings, by the Marine Technology Society, Washington D.C., and IEEE Ocean Engineering Society, Piscataway, NJ.*

*a. Metals*

*Antimony - A metal used as a hardening alloy for lead, particularly in lead-acid batteries. Also used as a semiconductor and in pyrotechnics.*

*Arsenic - A metal used as an alloy with lead and copper in shot, batteries, and cables. Arsenic trioxide is used as a pigment and as an insecticide, rodenticide, herbicide, sheep and cattle dip, hide preservative, and wood preservative. It was used as a pesticide in the production of canec panels in Hilo. Use in houses is restricted to concentrations below 1.5 percent. Carcinogen.*

*Beryllium - A metal for various high-technology uses including nuclear reactor moderator and structural material. Carcinogen.*

*Cadmium - A metal used in electroplating and coating, alloys, nickel-cadmium batteries, pigments, and in a variety of other industrial areas.*

*Chromium - A metal used in plating, alloys and in pigments. Hexavalent forms are most toxic and are used in cooling tower additives.*

*Copper - A metal used in wiring, plumbing, electroplating, alloys, insecticides, and in anti- fouling paints.*

*Lead - A metal used in batteries, gasoline additives, solder, and ammunition.*

*Mercury - A metal used in dentistry, electronics, instruments, lamps, metallurgy and formerly in anti-fouling paints.*

*Nickel - A metal used in alloys, electroplating, and batteries.*

*Selenium - A metalloid element used in electronics, rubber production, dandruff shampoo, and a trace element in animal feed.*

*Silver - A metal with various electronic, chemical, plating, photographic, and dental uses.*

*Thallium - A metal. Pesticide registration of thallium sulfate cancelled.*

*Tributyltin - Tributyltin is of environmental concern primarily because of its use in marine anti- fouling paints. This use has recently been restricted by Congress. Organotins have also been used in agriculture and residential areas to control fungi and insects including moths, houseflies, cockroaches, and mosquito larvae. The largest use is in stabilizing polyvinyl chloride polymers used in construction materials and food packaging.*

*Zinc - A metal used in alloys, electroplating, galvanizing, batteries, and cathodic protection.*

*b. Organonitrogen Compounds*

*Benzidine - Aromatic amine used in dye production. Carcinogen.*

*Dinitro-o-cresol - Pesticide, fungicide, insecticide and miticide. Also used as a blossom- thinning agent on fruit trees.*

*Dinitrotoluene - Commercial and military explosive.*

*Diphenylhydrazine - Used as a reagent for the sugars arabinose and lactose and for the production of phenylbutanone and benzidine.*

*Nitrobenzene - Used in the production of aniline dyes, rubber, medicinals, metal polish, shoe black, perfume, and as a combustion propellant and chemical reaction, and crystallizing solvent.*

*Nitrosamines - Only small quantities are synthesized for research and rubber and pesticide production. Primary environmental exposure is probably due to the nitrosation of amine*

*and amide precursors in reactions in air, soil, water, food, and animal systems. Carcinogen.*

*c. Pesticides*

*Aldrin - Insecticide used in ground injection for termite control and non-food plant dip. Registration for other uses cancelled. Metabolizes to dieldrin. Carcinogen.*

*Chlordane - Insecticide used for termite control and non-food plant dip. Registration for other uses cancelled. Carcinogen.*

*Chlorpyrifos - Organophosphorus insecticide (a.k.a. Dursban, Lorsban). Used locally for termite control.*

*DDT - Persistent lipid-soluble chlorinated pesticide. Formerly most widely used. All pesticide uses cancelled except by government agencies and physicians. Metabolizes to DDE and TDE. Carcinogen.*

*Demeton - Systemic insecticide and acaricide applied as a foliage spray and soil drench.*

*Dieldrin - Persistent insecticide used in ground injection for termite control and as non-food plant dip. Registration for other uses cancelled. Carcinogen.*

*Endosulfan -Insecticide and acaricide (a.k.a. Thiodan). Used on pineapples in Hawaii.*

*Endrin - Pesticide, rodenticide, and avicide. Used on sugarcane to control the sugarcane beetle. Registration cancelled for control of the sugarcane borer. Teratogen.*

*Guthion - Organophosphorus pesticide used for many pests on various fruits, melons, nuts, vegetables, field crops, ornamental, and shade trees.*

*Heptachlor - Insecticide registered for termite control and non-food plant dip. Registration for other uses cancelled. Carcinogen.*

*Lindane - Broad spectrum insecticide used in livestock sprays, forestry, christmas trees, structural treatments, hardwood logs and lumber, dog sprays, dusts and dips, flea collars, moth sprays, seed treatments, shelf paper, and household sprays. Carcinogen.*

*Malathion - Organophosphorus insecticide used for many insects including: aphids, spider mites, scale insects, house flies, mosquitos, and for insects attacking fruits, vegetables, ornamental and stored products. Used in public health programs to control mosquitos.*

*Methoxychlor - Organochlorine pesticide.*

*Mirex - Organophosphorus insecticide. Registration cancelled 12/01/77. Mirex was used to control fire ants on pineapples in Hawaii.*

*Parathion - Organophosphorus pesticide used on fruit, nut, vegetable, and field crops. TDE - Metabolite of DDT. Carcinogen.*

*Toxaphene - 175 compounds of chlorinated camphene. Formerly the most heavily used pesticide. Registration cancelled in 1982 with exceptions for cattle, pineapples, and bananas. No U.S. production. Persistent in the environment. Carcinogen.*

*d. Phenols*

*Chlorinated Phenols - (Includes cholorinated cresols). Synthesis of dyes, pigments, resins, pesticides, herbicides and used directly as flea repellents, fungicides, wood preservatives, mold inhibitors, antiseptics, disinfectants, and anti-gumming agents in gasoline. Chlorinated phenol pesticide products include 2,4-D, 2,4-DCP, 2,4,5-T, 2,3,4,6-TCP, and PCP. Some forms carcinogenic.*

*2-Chlorophenol - Intermediate in chemical production of fungicides, slimicides, bactericides, antiseptics, disinfectants, and wood and glue preservatives. Can be produced in the chlorination of drinking water and sewage. May be biodegraded.*

*2,4-Dichlorophenol - Used in the production of herbicides (2,4-D) and in mothproofing, antiseptics, and seed disinfectants. Metabolic and photodegradation product of the above.*

*Nitrophenols - 2,4,6 trinitrophenol (picric acid) has been used as an explosive, dye intermediate, reagent, germicide, fungicide, staining agent and tissue fixative, and in photochemicals, pharmaceuticals, and metal etching. Mono and dinitrophenols*

*would occur in the environment primarily from discharges from manufacturing plants or possibly from the degradation of pesticides. They are used in the production of dyes, photochemicals, pesticides, wood preservatives, explosives, and leather treatments. See also 2,4 dinitro-o-cresol.*

*Pentachlorophenol - Very common pesticide, fungicide, and bactericide (a.k.a. PCP).*

*Phenol - Used in production of epoxy and phenolic resins, pharmaceuticals, germicides, fungicides, slimicides, herbicides, dyes and acids, and as a disinfectant and antiseptic.*

*e. Phthalates*

*Phthalate Esters - Plasticizers used especially in Polyvinyl chloride (PVC) production. Easily extractable and up to 60 percent of the total weight of plastic. Also used in the production of pesticide carriers, cosmetics, fragrances, munitions, industrial oils, and insect repellents.*

*f. Polynuclear Aromatic Hydrocarbons*

*Acenaphthene - Coal tar product used in the manufacturing of dyes and plastics and as an insecticide and fungicide. Also detected in cigarette smoke and gasoline exhaust.*

*Fluoranthene - A polynuclear aromatic hydrocarbon. Primarily a pyrolysis product formed in frying, smoking, incineration, etc. Natural as well as man-made sources. Carcinogen.*

*Naphthalene - Primary parameter of coal tar. Used in dye production, formulation of solvents, and chemical synthesis. Also used in lubricants and motor fuels, and as a moth repellant, insecticide, anthelminthic, vermicide, and intestinal antiseptic.*

*Polynuclear Aromatic Hydrocarbons - Diverse class of compounds formed by incomplete combustion of organics with insufficient oxygen. Examples include benzo[a]pyrene and benz[a]anthracene. Carcinogen.*

*g. Volatile Organics*

*Acrolein - Biocide for weed, algae, mollusk and slime control, and to protect liquid fuels from microorganisms. Also used in leather tanning, tissue fixation, paper, textiles, crease- proofing cotton, and as a chemical intermediate, plasticizer, copolymer in photography, builder in laundry and dishwashing detergents, and coating for aluminum and steel.*

*Acrylonitrile - Copolymer used in the production of fibers and plastics (e.g., ABS Acrylonitrile- Butadiene-Styrene plastic), and latexes and chemicals. Banned as a resin for soft drink containers and as a fumigant. Similar toxic effects as cyanide. Carcinogen.*

*Benzene - Coal tar and petroleum product used in pharmaceutical and chemical synthesis, including the production of styrene, detergents, pesticides, thinners, and inks. Also used as a cleaner and degreaser, solvent, and gasoline anti-knock additive. Carcinogen.*

*BHC - Benzene hexachloride. See hexachlorocyclohexane and lindane. C arcinogen.*

*Carbon Tetrachloride - Solvent and grain fumigant also used in fire extinguishers. Carcinogen.*

*Chlorinated Benzenes - Solvents for fats, oils and greases, also used as fumigants, degreasers, lubricants, dielectrics, dye carriers, wood preservatives; in chemical, pesticide, and herbicide production; heat transfer; military pyrotechnics; and termite control. Carcinogen.*

*Chlorinated Ethanes - Used in the production of tetraethyl lead and vinyl chloride and as solvents and chemical intermediates. Some forms carcinogenic.*

*Chloroalkyl ethers - Used in organic synthesis, textiles, ion exchange resins, pesticides, and reaction solvents.*

*Chloroform - Chemical solvent. Formed in the chlorination of sewage and water supplies. Carcinogen.*

*Dichlorobenzenes - Used in air deodorants, insecticides, chemical production, dyes, herbicides, and degreasers.*

*Dichlorobenzidine - Used in the production of dyes and pigments and a curing agent for polyurethanes. Carcinogen.*

*Dichloroethylenes - Intermediate in chemical production, and polyvinylidene chloride copolymers in food packaging materials (e.g., plastic wrap) and tank coatings. Degradation products of larger chlorinated hydrocarbons. Carcinogen.*

*Dichloropropane - Soil fumigant for nematodes, oil and fat solvent, and degreaser. Dichloropropene - Soil fumigant for nematodes, used in Hawaii on pineapples. Also oil and fat solvent and degreaser.*

*Ethylbenzene - Up to 20 percent of gasoline. Widespread commercial use including production of styrene, diluents in paints, and used as insecticides.*

*Hexachlorobutadiene - Organic solvent used in chlorine production recovery, in rubber and lubricant production, and as a gyroscope fluid. Carcinogen.*

*Hexachlorocyclohexane - Broad spectrum insecticide (a.k.a. BHC). Only the gamma isomer, lindane, is currently registered and produced. Carcinogen.*

*Hexachlorocyclopentadiene - Base of several chlorinated pesticides including: aldrin, dieldrin, chlordane, heptachlor, endrin, isodrin, kepone, mirex, endosulfan, and pentac. Also used in the production of flame retardants.*

*Isophorone - Solvent for fats, oils, gums, natural and synthetic resins, cellulose derivatives, lacquers, pesticides and herbicides. Used in chemical and plant growth retardant production.*

*Tetrachloroethylene - Solvent in textile and dry cleaning, metal cleaning, and chemical production (a.k.a. perchloroethylene or PCE). Carcinogen.*

*Toluene - Aviation fuel and high-octane blending stock, chemical intermediate, thinner, solvent for paints, gums, resins, oils, rubber, and vinyl, and used in plastic cement, chemicals, explosives, and detergents.*

*Trichlorinated ethanes - Metal degreaser, chemical intermediate, adhesive and resin solvent, pesticide, dry cleaning solvent, formerly used as a fumigant 1,1,2 isomer carcinogenic.*

*Trichloroethylene - Degreasing solvent in metal industries. Formerly dry cleaning solvent and extractive solvent in foods (a.k.a. TCE). Carcinogen.*

*Vinyl chloride - Polymerized in the production of PVC, the most widely used material in the manufacture of plastics. All pesticide uses cancelled (whether an active or inert ingredient) for uses in the home, food handling establishments, hospitals, and enclosed areas. Degradation product of larger chlorinated hydrocarbons. Carcinogen.*

*h. Others*

*Chlorine - Chlorine is commonly used to disinfect wastewater and water supplies and to control fouling organisms in cooling water systems.*

*Cyanide - Used and formed in many industrial processes including steel, petroleum, plastics, synthetic fibers, metal plating, mining, and chemical industries.*

*Dioxin - Trace contaminant of chlorinated phenols, chlorinated phenoxy acids (especially the herbicide 2,4,5-T and Silvex), and hexachlorophene. Carcinogen.*

*Polychlorinated biphenyls (PCBs) - Used as a transformer and capacitor fluid. Also used as a heat transfer, hydraulic, compressor, and vacuum pump fluid, plasticizer, and in lubricants and wax extenders. No longer manufactured in the United States. All pesticide uses eliminated. Carcinogen.*