

**PROPOSED FORMAT FOR PRIORITY CHEMICAL LIST
CALIFORNIA ENVIRONMENTAL CONTAMINANT BIOMONITORING PROGRAM**

**Materials for Scientific Guidance Panel Meeting
February 9, 2010**

Agenda Item: Overview of Updated Designated and Priority Chemical Lists

California Environmental Contaminant Biomonitoring Program (CECBP) Priority Chemicals

Priority chemicals are the subset of designated chemicals that were recommended by the Scientific Guidance Panel (SGP) as priorities for biomonitoring in California. Biomonitoring of priority chemicals involves measuring the parent chemical or another appropriate target chemical in individuals tested. Per the SGP's recommendation, the CECBP will determine the most appropriate target chemical(s) to measure.¹

Brominated and Chlorinated Organic Compounds used as Flame Retardants²

2,2-Bis(bromomethyl)-1,3-propanediol
2,2-Bis(chloromethyl)trimethylene bis[bis(2-chloroethyl)phosphate]
Bis(2-ethyl-1-hexyl) tetrabromophthalate
Bis(hexachlorocyclopentadieno)cyclooctane (Dechlorane Plus)
1,2-Bis(2,4,6-tribromophenoxy)ethane
1,2-Dibromo-4-(1,2-dibromoethyl)cyclohexane
2,3-Dibromopropyl-2,4,6-tribromophenyl ether
2-Ethyl-1-hexyl-2,3,4,5-tetrabromobenzoate
Chlorendic acid
Decabromodiphenylethane
Hexabromobenzene
2,2',4,4',5,5'-Hexabromobiphenyl (BB 153)
Hexabromocyclododecane (HBCD)
Hexachlorocyclopentadienyl-dibromocyclooctane
N,N-Ethylene-bis(tetrabromophthalimide)
Pentabromoethylbenzene
Pentabromotoluene
Short-chain chlorinated paraffins
Tetrabromobisphenol A (TBBPA)
Tetrabromobisphenol A bis(2,3-dibromopropyl ether)
Tetrabromobisphenol A bis(2-hydroxyethyl) ether
Tetrabromophthalic anhydride
Tetrakis(2-chloroethyl)dichloroisopentyl diphosphate
2,4,6-Tribromophenol
Tris(2-chloroethyl)phosphate
Tris(1-chloro-2-propyl)phosphate
Tris(1,3-dichloro-2-propyl)phosphate
Tris(2,3-dichloro-1-propyl)phosphate

Polybrominated diphenyl ethers (PBDEs)

2,2',4-Tribromodiphenyl ether (BDE 17)
2,4,4'-Tribromodiphenyl ether (BDE 28)
2,2',4,4'-Tetrabromodiphenyl ether (BDE 47)
2,3',4,4'-Tetrabromodiphenyl ether (BDE 66)
2,2',3,4,4'-Pentabromodiphenyl ether (BDE 85)
2,2',4,4',5-Pentabromodiphenyl ether (BDE 99)
2,2',4,4',6-Pentabromodiphenyl ether (BDE 100)
2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE 153)

2,2',4,4',5,6'-Hexabromodiphenyl ether (BDE 154)
2,2',3,4,4',5',6'-Heptabromodiphenyl ether (BDE183)
2,2',3,3',4, 4',5,5',6,6'-Decabromodiphenyl ether (BDE 209)

Cyclosiloxanes²

Decamethylcyclopentasiloxane (D5)
Dodecamethylcyclohexasiloxane (D6)
Octamethylcyclotetrasiloxane (D4)

Diesel Exhaust³

Environmental Phenols⁴

Bisphenol A (2,2-bis[4-Hydroxyphenyl] propane)
Triclosan (2,4,4'-Trichloro-2'-hydroxyphenyl ether)

Metals^{4,5}

Arsenic
Arsenic (V) acid
Arsenobetaine
Arsenocholine
Arsenous (III) acid
Dimethylarsinic acid
Monomethylarsonic acid
Trimethylarsine oxide
Cadmium
Lead
Mercury

Perchlorate

Perfluorochemicals⁴

N-Ethylperfluorooctanesulfonamido acetic acid
N-Methylperfluorooctanesulfonamido acetic acid
Perfluorobutane sulfonic acid (PFBuS)
Perfluorodecanoic acid (PFDeA)
Perfluorododecanoic acid (PFDoA)
Perfluoroheptanoic acid (PFHpA)
Perfluorohexane sulfonic acid (PFHxS)

Perfluorononanoic acid (PFNA)
Perfluorooctane sulfonamide (PFOSA)
Perfluorooctane sulfonic acid (PFOS)
Perfluorooctanoic acid (PFOA)
Perfluoroundecanoic acid (PFUA)

Pesticides^{4,6}

Herbicides⁴

2,4-Dichlorophenoxyacetic acid (2,4-D), salts and esters

2,4-Dichlorophenoxyacetic acid
2,4-Dichlorophenol

Organochlorine Pesticides⁴

Dichlorodiphenyltrichloroethane (DDT) (including *p,p'*-DDT and *o,p'*-DDT)
p,p'-Dichlorodiphenyldichloroethene (DDE)

Organophosphorus Insecticides⁴

Acephate

Azinphos methyl

Dimethyldithiophosphate (DMDTP)
Dimethylphosphate (DMP)
Dimethylthiophosphate (DMTP)

Chlorethoxyphos

Diethylphosphate (DEP)
Diethylthiophosphate (DETP)

Chlorpyrifos

Diethylphosphate
Diethylthiophosphate
3,5,6-Trichloro-2-pyridinol

Chlorpyrifos methyl

Dimethylphosphate
Dimethylthiophosphate
3,5,6-Trichloro-2-pyridinol

Coumaphos

3-Chloro-7-hydroxy-4-methyl-2H-chromen-2-one/ol
Diethylphosphate
Diethylthiophosphate

Diazinon

2-Isopropyl-4-methyl-6-hydroxypyrimidine
Diethylphosphate
Diethylthiophosphate

Dichlorvos (DDVP)

Dimethylphosphate

Dicrotophos

Dimethylphosphate

Dimethoate

Dimethyldithiophosphate
Dimethylphosphate
Dimethylthiophosphate

Disulfoton

Diethyldithiophosphate
Diethylphosphate

Diethylthiophosphate

Ethion

Diethyldithiophosphate

Diethylphosphate

Diethylthiophosphate

Fenitrothion

Dimethylphosphate

Dimethylthiophosphate

Fenthion

Dimethylphosphate

Dimethylthiophosphate

Isazophos-methyl

5-Chloro-1,2-dihydro-1-isopropyl-[3H]-1,2,4-triazol-3-one

Dimethylphosphate

Dimethylthiophosphate

Malathion

Dimethyldithiophosphate

Dimethylphosphate

Dimethylthiophosphate

Malathion dicarboxylic acid

Methamidophos

Methidathion

Dimethyldithiophosphate

Dimethylphosphate

Dimethylthiophosphate

Methyl parathion

Dimethylphosphate

Dimethylthiophosphate

p-Nitrophenol

Naled

Dimethylphosphate

Oxydemeton-methyl

Dimethylphosphate

Dimethylthiophosphate

Parathion

Diethylphosphate

Diethylthiophosphate

p-Nitrophenol

Phorate

Diethyldithiophosphate

Diethylphosphate

Diethylthiophosphate

Phosmet (Imidan)

Dimethyldithiophosphate

Dimethylphosphate

Dimethylthiophosphate

Pirimiphos-methyl

2-(Diethylamino)-6-methylpyrimidin-4-ol/one

Dimethylphosphate

Dimethylthiophosphate

Sulfotepp

Diethylphosphate

Diethylthiophosphate

Temephos

Dimethylphosphate

Dimethylthiophosphate
Terbufos
Diethyldithiophosphate
Diethylphosphate
Diethylthiophosphate
Tetrachlorvinphos
Dimethylphosphate

Pyrethroid Pesticides⁴

Allethrin
cis/trans-Dimethylvinylcyclopropane carboxylic diacid
Cyfluthrin
4-Fluoro-3-phenoxybenzoic acid
cis-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
Cypermethrin
3-Phenoxybenzoic acid
cis-Cypermethrin
cis-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
trans-Cypermethrin
trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
Deltamethrin
3-Phenoxybenzoic acid
cis-3-(2,2-Dibromovinyl)-2,2-dimethylcyclopropane carboxylic acid
Permethrin
3-Phenoxybenzoic acid
cis-Permethrin
cis-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
trans-Permethrin
trans-3-(2,2-Dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid
Pyrethrin 1
cis/trans-Dimethylvinylcyclopropane carboxylic diacid
Resmethrin
cis/trans-Dimethylvinylcyclopropane carboxylic diacid

Phthalates⁴

Benzylbutyl phthalate (BzBP)
Mono-benzyl phthalate
Dibutyl phthalate (DBP)
Mono-n-butyl phthalate
Mono-isobutyl phthalate
Dicyclohexyl phthalate (DCHP)
Mono-cyclohexyl phthalate
Diethyl phthalate (DEP)

Mono-ethyl phthalate
Di-2-ethylhexyl phthalate (DEHP)
Mono-(2-ethyl-5-carboxypentyl) phthalate
Mono-2-ethylhexyl phthalate
Mono-(2-ethyl-5-hydroxyhexyl) phthalate
Mono-(2-ethyl-5-oxohexyl) phthalate
Di-isononyl phthalate (DiNP)
Mono(carboxyisononyl) phthalate
Mono(hydroxyisononyl) phthalate
Mono-isononyl phthalate
Mono(oxoisononyl) phthalate
Dimethyl phthalate (DMP)
Mono-methyl phthalate
Di-n-octyl phthalate (DOP)
Mono-(3-carboxypropyl) phthalate
Mono-n-octyl phthalate

Polycyclic Aromatic Hydrocarbons⁴

Benzo[a]pyrene
3-Hydroxybenzo[a]pyrene
Chrysene
1-Hydroxychrysene
2-Hydroxychrysene
3-Hydroxychrysene
4-Hydroxychrysene
6-Hydroxychrysene
Phenanthrene
1-Hydroxyphenanthrene
2-Hydroxyphenanthrene
3-Hydroxyphenanthrene
4-Hydroxyphenanthrene
9-Hydroxyphenanthrene

Tobacco Smoke

Nicotine
Cotinine

Volatile Organic Compounds⁴

1,4-Dichlorobenzene (*p*-Dichlorobenzene)
2,5 Dichlorophenol

Notes

¹ The target chemical(s) for measurement may be the parent chemical, metabolite(s), other biomarker(s), or relevant indicator chemicals (e.g., environmental degradation products) and may change as methods development proceeds. Metabolites, other biomarkers or relevant indicator chemicals are shown indented under the parent chemical.

² All members of the chemical class are priority chemicals, including, but not limited to, the chemicals listed.

³ All components of diesel exhaust are priority chemicals.

⁴ All members of the chemical class are not priority chemicals; only the specific chemicals listed are priority chemicals.

⁵ The CDC measures various forms of metals. CECBP will determine the most appropriate way to measure levels of the target metal in individuals tested, per the SGP's recommendation.

⁶ Fungicides, herbicides, and insecticides are grouped under the general heading of "Pesticides", consistent with CDC.