TABLE 1. CHEMICALS NOMINATED TO THE NTP FOR IN-DEPTH TOXICOLOGICAL EVALUATION FOR CARCINOGENESIS TESTING IN FISCAL YEARS 1988-2001

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Accutane 4759-48-2	Private Individual 2000	- Widespread use in treatment of acne - Potential for serious adverse effects in young adults	In review
Acesulfame potassium 55589-62-3	Center for Science in the Public Interest 1996	- The FDA is considering a food additive petition for the use of acesulfame potassium as an artificial sweetener in nonalcoholic beverages. - Widespread consumer exposure - Tests carried out to date do not give reasonable assurance that the chemical is safe.	This chemical is under FDA jurisdiction
Acetaminophen (4-hydroxyacetanilide) 103-90-2	Private Individual 1994	See Local Anesthetic compounds	See Local Anesthetic Compounds
Acetic acid 64-19-7	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
Acetochlor 34256-82-1	NIEHS 1992	- Nominated as part of the U.S.- Hungary cooperative effort to study the effects of agricultural chemicals in the U.S. and Europe - Widespread use as a herbicide - Potential for large-scale human exposure - Lack of carcinogenicity testing data	In discussions between NTP staff and representatives of Hungary, it was decided that acetochlor had been well-studied and that simazine could be substituted for acetachlor as an agent to study. Simazine was of common interest to both parties and Hungary has completed a rat study. Simazine (122-34-9) - Subchronic dosed-feed completed - Chronic dosed-feed on test
Acetyl tributyl citrate (ATBC) 77-90-7	NCI 1991	- Widespread use; potential for increased use - Reports of food contamination from polyvinyl chloride (PVC) "cling-film" wrap and with plasticizers from other packaging materials - Lack of toxicity data	- Withdrawn by nominator
2-Acetylpyridine 1122-62-9	NCI 1997	- Potential for occupational or environmental exposures as a result of production or processing - Potential for general and consumer population exposures based on its natural occurrence as a flavor/aroma constituent and wide use as a component in processed food products and in aroma therapy - Lack of genetic and chronic toxicity test data - Suspicion of carcinogenicity based on pyridyl ketone structure	Based on low production of 2-acetylpyridine (10,000 lb/yr), NTP will recommend 2-acetylpyridine be withdrawn as a candidate for NTP study.
C.I. Acid Brown 83 13011-68-2	Private Individual 1990	- Potential for human exposure - Found to be a source of mutagens after leather coloring processes were conducted	- Nominated for carcinogenicity; under review
C.I. Acid Red 52 3520-42-1	NCI 1989	See Dyes	See Dyes
S-Adenosylmethionine (SAMe) 29908-03-0	NCI 2000	- Widespread use as a popular dietary supplement used to treat osteoarthritis, depression, and liver disease - It is not known if high doses of exogenously administered SAMe can cause adverse effects from methylation of DNA bases.	Selected for genotoxicity and subchronic toxicity testing.

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Adiponitrile 111-69-3	NIEHS 1995	High production volume	No testing. The toxicity of adiponitrile is essentially that of cyanide. Since the toxicity of cyanide is well known and the NTP has studied other nitriles and the toxicity of this class of chemicals is well documented, it was not recommended for testing. - Negative in *Salmonella*
Alcohol Drug Combinations	Private Individual 1994	Intolerance to alcohol when combined with certain drugs	No longer being considered for study.
Alkoxy Silanes Class	Private Individual 1994	- Lack of quantitative carcinogenicity data by the oral route and little attention to reproductive and immunotoxic effects - Increased use in many schools and public buildings to remediate conditions related to microbiological contamination - Inadequate testing	Referred to the Interagency Testing Committee (ITC)
Long-Chain Alkylbenzenes	State of Connecticut 1995	- Believed to be high production chemicals - Literature suggests promotional effect as active promoters in dermal studies - Common marine pollutants which have been shown to bioaccumulate in shellfish - Lack of chronic toxicity data	Nominated for carcinogenicity testing; under review
Allyl acetate/Allyl alcohol	NCI 1993	- Potential for high human exposure - High production volume - Positive in numerous mutagenicity assays - Allyl alcohol was nominated with allyl acetate because of metabolism considerations.	Allyl acetate (591-87-7): - Gavage prechronic study completed, TOX-48 - Metabolism on test - Negative in micronucleus assay - Positive in *Salmonella* Allyl alcohol (107-18-6): - Gavage prechronic study completed, TOX-48 - Negative in micronucleus assay - Negative in *Salmonella*
Allyl bromide 106-95-6	NCI 1995	- Widespread use - Persistent as an environmental pollutant - Suspicion of carcinogenicity - Positive genotoxicity test results	- Subchronic gavage completed, scheduled for peer review - Repeated dose, skin paint, completed - Positive in *Salmonella* - Negative in micronucleus assay - Toxicokinetics (*in vitro*), report
Aloe Vera Gel 8001-97-6	NCI 1999	- Widespread oral and dermal exposure - Lack of toxicity information - A suspicion of carcinogenicity based on cell proliferation similar to that observed for croton oil	Selected for cell transformation assay, photoxicity studies

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Aluminum Contaminants Of Drinking Water	U.S. EPA and NIEHS 2000	- Aluminum is a listed by the EPA as a drinking water contaminant with a high health research priority. - Since aluminum is found in nearly all drinking water and fluoridation may enhance absorption, there is a need for long-term low concentration rodent studies.	Aluminum Citrate 31142-56-0 -Selected for chronic drinking water studies Aluminum Fluoride 7784-18-1 -Selected for chronic drinking water studies
Aluminum sulfate 7783-20-2	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
3-Amino-5-mercapto-1,2,4-triazole 16691-43-3	NIEHS 1997	- High production volume - Inadequate or no toxicological studies	Deferred for more information on use, production, and human exposure patterns
Ammonium sulfate 10043-01-3	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
Ammonium molybdate 12027-67-7	NCI 1999	- Nominated as a representative soluble molybdenum compound and as a structural analog of molybdenum trioxide, an insoluble compound that was shown to produce alveolar carcinomas after exposure by the inhalation route.	Selected for toxicity testing. Under review for determining if sodium molybdate (12680-49-8) should be tested in place of ammonium molybdate.
Tertiary-Amyl methyl ether (TAME) 994-05-8		See Fuel additives	See Fuel additives
Androstenedione 63-05-8	NCI 1998	- Potential for abuse by athletes and bodybuilders as a steroidal precursor to testosterone - Lack of chronic testing data	- Repeated dose, gavage and skin paint, completed - Chemical disposition, on test - Negative in Salmonella - Negative in micronucleus
Annatto 1393-63-1	NCI 1998	- High production volume - Widespread consumer exposure to annatto, one of the most highly consumed colorants in the U.S. food supply - Lack of toxicity data for bixin or norbixin, which are concentrated in annatto extracts and oils	Selected -Testing deferred pending results of industry testing
Antimony trioxide 1309-64-4	State of California EPA (OEHHA) 1995	- Lack of acute exposure data	No testing. Other study data exist.
Antiperspirants	Private Individual 1994	- Investigate the possible connection between the use of antiperspirants and the increase of breast cancer in women	Nominated for carcinogenicity testing; under review
Arsenic 7440-38-2	Private Individual 1993	- Arsenic is considered to be the only chemical declared carcinogenic for humans without having unequivocal supporting evidence in animals.	Arsenic (7440-38-2) Arsenic trioxide was selected as the representative chemical to test.
Arsenic trioxide 1327-53-3	Private Individual 1993 NIEHS 1994	Arsenic trioxide is listed by IARC as a Group 1 human carcinogen. It was nominated for carcinogenicity studies in F344 rats and B6C3F$_1$ mice to further validate the NTP animal models and to strengthen the predictivity value of animal studies for assessment of human risk.	Selected for carcinogenicity testing - Deferred at this time. Lack of appropriate animal model for human carcinogenicity - Neurotoxicity assessment completed

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Articaine 23964-58-1	Private Individual 1994	See Local Anesthetic compounds	See Local Anesthetic compounds
Asbestos Fibers	Private Individual 1994	- Lack of adequate inhalation studies on asbestos fibers	Selected for toxicity studies
Aspartame 228309-47-0	Private Individual 1991	- Widespread consumer exposure; used as an artificial sweetener	- Selected for transgenic studies - Neurotoxicology assessment, completed - Completed subchronic studies - Positive/negative in micronucleus assay - Negative/negative in two micronucleus assays
Asphalt Fumes 8052-42-4	State of California EPA 1994 NIOSH 1997	- Potential for widespread occupational exposure - Unresolved questions regarding the effects of exposure	Selected for toxicity, carcinogenicity, immunotoxicity, and lung irritation and function tests
Atrazine 1912-24-9	Private Individual 1991 NIEHS 1994	- Wide use as pre-emergent herbicide that pollutes groundwater - Some studies have indicated tumor induction in mice. See Pesticides and Kids See Pesticide/Fertilizer Contamination	Further testing deferred pending review and assessment of industry and other studies for adequacy. - Immunotoxicity, completed - Negative in *Salmonella* See Pesticides and Kids
3'-Azido-3'-deoxythimidine (AZT) 30516-87-1	NCI 1990	- Primary drug used to treat AIDS and HIV positive patients - Concern over the chronic toxicity effects of the drug to humans	- Prechronic studies completed - Chronic studies peer reviewed 12/96 (TR-469) - Positive in *Salmonella* and micronucleus assays - Negative for CA and positive for SCE in CHO cells *in vitro* - Dominant lethal, completed - Immunotoxicity, report in preparation - Continuous breeding, report in review
Benlate DF with Flusilazole and Chlorothalonil	State of Florida, Dept. of Health and Rehab Svstem 1995	- Large number of agricultural workers exposed - Little is known about the toxicology of benlate in combination with suspected contaminants, flusilazole and chlorothalonil	Nominated for toxicological testing; under review. Benomyl and Benlate DF are regulated by the EPA. Chlorothalonil (1897-45-6): - Carcinogenicity dosed-feed technical report published (TR-41 reports CE- MR, FR; NE- MM, FM) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Positive in mouse lymphoma - Negative in *Salmonella* Benomyl (17804-35-2) - Mechanisms completed - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Benomyl 17804-35-2	State of Florida, Dept. of Health and Rehab Svstem 1995	See Benlate DF with flusilazole and chlorothalonil	See Benlate DF with flusilazole and chlorothalonil
Bentonite 1302-78-9	NIOSH 1998	- Need to determine its potential to cause lung disease. Reports note a relatively high incidence of fibrotic lung disease in workers exposed to bentonite and it is currently not regulated in the workplace.	Selected for inhalation carcinogenicity studies - May be difficult to procure pure substance
Benzene 71-43-2	Private Individual 1991	- High production volume - Widespread population exposure - Continuing interest in public health issues as well as to mechanisms of action	Nomination withdrawn by nominator - Final report of gavage carcinogenicity studies published (TR-289 reports CE- MR, FR, MM, FM) - Human metabolism (*in vitro*) chemical disposition completed - Neurotoxicology assessment, completed - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative in Mouse Lymphoma - Positive in micronucleus assays - Negative in *Salmonella*_ - Total reproductive capacity completed
Benzo[*a*]pyrene [B(a)P] 50-32-8	Dept. of Health Services, Health and Welfare Agency, State of California 1989	- Environmental pollutant produced by the incomplete combustion of carbon products - Widespread exposure - Sufficient dose-response data needed for low-dose extrapolation to establish health based exposure criteria for humans environmentally exposed to B(a)P	Nominated for carcinogenicity; under review - Total reproductive capacity, completed - Positive in *Salmonella* in two independent tests and one non-standard protocol - Positive male/female mouse lymphoma - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations and reciprocal translocation in *Drosophila* - Positive dominant lethal females
Benzocaine 94-09-7	Private Individual 1994	See Local Anesthetic compounds	See Local Anesthetic compounds
5,6-Benzoflavone 6051-87-2	NCI 1999	- Currently under review at NCI as a possible chemopreventive agent without an industry sponsor - Has not been tested for carcinogenicity and may exhibit reproductive toxicity	Selected - Deferred pending receipt of data from NCI preclinical toxicity studies
Benzophenone 119-61-9	NIEHS 1988	- Worker and consumer exposure - Lack of chronic toxicity data	- Subchronic dosed-feed complete; TOX-61 - Chronic, on test - Negative in *Salmonella* - Negative in micronucleus - Teratology pilot studies completed - Teratology pilot studies selected - Teratology studies completed - Toxicokinetics completed, report

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Benzothiazole 95-16-9	NCI 1997	- Potential for human exposure from its presence in foods and beverages, and as an environmental contaminant - Lack of chronic toxicity data	Deferred - uncertain human exposure - Negative in *Salmonella*
Benzoyl chloride 98-88-4	NCI 1990	- Potential for significant human exposure - Use as an acylating agent in many commercial processes - Suspicion of carcinogenicity as an acylating agent	- Previously selected for general toxicology study but deferred because of budgetary considerations - Inhalation study withdrawn because of experimental difficulties - Renominated for 2-stage initiation/promotion studies by intratracheal or implantation route
Benzyl chloride 100-44-7	State of California EPA (OEHHA) 1995	- Lack of acute exposure data	No additional testing. Lack of funding to conduct a repeat study or to fill data gaps when carcinogenicity and other study data are already available. - Chronic gavage bioassay reported in paper (W. Lijinsky (1986). Chronic Bioassay of Benzyl Chloride in F344 Rats and (C57BL/6JXBALB/C) F_1 Mice. J Nat Cancer Inst 76, No. 6:1231-1235) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Weakly positive in *Salmonella* in two independent tests
Benzyltrimethylammonium chloride 56-93-9	NIEHS 1988	- High production volume - Worker exposure - Lack of chronic toxicity data	- Subchronic gavage and topical studies completed, TOX-57 - Chemical disposition completed - Metabolism completed - Toxicokinetics completed - Negative in *Salmonella* - Positive in micronucleus assay
Berberine chloride dihydrate 5956-60-5	NIEHS 1998	- Potential for human exposure - Lack of chronic or carcinogenicity data	Teratology studies completed
Bis(tri-n-butyltin) oxide 56-35-9	NCI 1988	- High and increasing production volume - Potential for human exposure - Detected in fresh water - Associated with adrenal and pituitary tumors in Wistar rats - Lack of adequate chronic testing	Nominated for carcinogenicity; under review - Deferred pending receipt of mouse study results - Negative in *Salmonella*
Bisacodyl 603-50-9	NIEHS 1996	- Structurally related to phenolphthalein, which is currently being used in over-the-counter laxatives	Nominated for carcinogenicity testing; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Bisphenol A diglycidyl ether 1675-54-3	NIEHS 1988 United Automobile Workers (UAW) 1998 2000	- Found in the industrial environment in substantial levels	- Selected for testing - Referred to EPA for industry testing under TSCA Section 4(e) rule - Positive in *Salmonella* - Positive for chromosomal aberrations (CA) and sister chromatid exchanges (SCE) in Chinese hamster ovary (CHO) cells *in vitro*
Bisphenol S 80-09-1	NCI 1994	- Use expected to increase - Used in a variety of processes, especially as a chemical intermediate and monomer in the manufacture of plastics and resins	Withdrawn by nominator
Bixin 6983-79-5	NCI 1998	See Annatto	See Annatto
Black Cohosh 84776-26-1	NCI and NIEHS 2000	- Increased use as a dietary supplement used in the treatment of menstrual and menopausal symptoms in women - No chronic studies in humans or animals demonstrating the safety of black cohosh	Selected for subchronic, reproductive and developmental toxicity testing
Bladderwrack and Extract 68917-51-1 84696-13-9	NCI 2001	- Potential for widespread exposure as a dietary supplement promoted for weight loss - Lack of toxicity testing data coupled with a strong suspicion that adverse events may occur in humans exposed to it	Nominated for toxicity testing; under review
Blue Green Algae	NCI 2000	- Potential for widespread exposure; used as dietary supplement - Microcystins, a potent hepatotoxin and suspected liver carcinogen, and anabaena, which contain possible neurotoxins, have been found in the blue-green algae supplements.	Selected for subchronic, neurotoxicity, and genotoxicity testing
Brominated Chemicals	NIEHS 1995	- Most brominated chemicals evaluated to-date by the NTP were carcinogenic in rodents. The mechanisms of carcinogenesis are unknown. - Three of the nominated brominated chemicals have high production volumes and were identified as hazardous substances. - Five of the brominated chemicals were identified as pesticides that are regulated by the EPA.	Tetrabromophthalic anhydride (632-79-1): In review. Deferred pending receipt of industry data. - Negative in *Salmonella* 2-Bromo-2-nitro-1,3-propanediol (52-51-7): - Negative in *Salmonella* No testing - no significant toxicity effects observed in available studies; chemical not expected to have toxic effects at concentrations used Bromochloromethane (74-97-5) - Under review - Positive in *Salmonella* in two independent tests

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Brominated Chemicals (Continued)			2,4,6-Tribromophenol (118-79-6): No testing. Low production and low exposure - Negative in *Salmonella* Bromoacetic acid (79-08-3) - Under review - Positive in *Salmonella* Tribromosalan (87-10-5) - Under review - Negative in *Salmonella* Bromoxynil octanoate (1689-99-2) - Under review 1,2-Dibromo-2,4-dicyanobutane (35691-65-7) - Repeated dose gavage and skin paint, completed - Subchronic skin paint, completed - Selected for carcinogenicity testing - Metabolism completed; - Negative in *Salmonella* - Negative in micronucleus
2-Bromo-2-nitro-1,3-propanediol 52-51-7	Private Individual 1988 NIEHS 1995	See Brominated chemicals	See Brominated chemicals
1-Bromo-3-chloropropane 109-70-6	NIEHS 1999	- Structural similarity to 1,2-dibromo-3-chloropropane, a known animal carcinogen - Lack of toxicity and carcinogenicity data	No testing - low potential for human exposure
Bromoacetic acid 79-08-3	American Water Works Association Research Federation (AWWARF) 1991 NIEHS 1995 U.S. EPA, Office of Water 1995	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs See Brominated chemicals	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs) See Brominated chemicals
Bromochloroacetic acid 5589-96-8	U.S. EPA, Office of Water 1995 U.S. EPA 1997	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Bromochloroacetonitrile 83463-62-1	AWWARF 1991	See Water Disinfection By-Products	See Water Disinfection By-Products
Bromochloromethane 74-97-5	NIEHS 1995	See Brominated chemicals	See Brominated chemicals
Bromodichloroacetic acid 71133-14-7	AWWARF 1991 U.S. EPA, Office of Water 1995 U.S. EPA 1997	See Water Disinfection By-Products	See Water Disinfection By-Products
Bromodichloromethane 75-27-4	U.S. EPA, Office of Water 1995 U.S. EPA 1997	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs) Carcinogenicity gavage completed. (TR-321 reports CE- MR, FR, MM, FM)- Reproductive/developmental general toxicity study completed - Chemical disposition completed - Toxicokinetics study, on test - Negative in *Salmonella* - Positive in mouse lymphoma *In vitro* cytogenetics: negative (chromosome aberrations); inconclusive (sister chromatid exchanges) - Micronucleus: negative and inconclusive
Bromopropanes	OSHA 2000	- It is expected that domestic production and use of 1-bromopropane will increase significantly as companies use this industrial chemical in place of regulated substances. - 2-Bromopropane is a contaminant in commercial preparations of 1-bromopropane	1-Bromopropanes (106-94-5) Selected for toxicity, carcinogenicity, neurotoxicity, reproductive, and developmental toxicity testing 2-Bromopropanes (75-26-3) Selected for toxicity, carcinogenicity, neurotoxicity, reproductive, and developmental toxicity testing
N-Bromosuccinimide 128-08-5	NCI 1994	- Concern for possible chronic adverse health effects related to exposures - Widely used in many different kinds of laboratory settings	No testing. Since NBS is used as a brominating agent, it could be expected to be corrosive and would probably not produce systemic effects if ingested.
Bromoxynil octanoate 1689-99-2	NIEHS 1995	See Brominated Chemicals	See Brominated Chemicals
2,3-Butanedione (Diacetyl) 431-03-8	NCI 1994	-Wide-spread human exposure - Limited toxicity data	Selected for toxicity - No testing. NTP metabolism studies showed rapid and near complete metabolism to carbon dioxide. - Negative in micronucleus assay - Weakly positive in *Salmonella* - Chemical disposition, completed

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
1,2,3,4-Butanetetracarboxylic acid 1703-58-8	NCI 1989	- Potential use as substitute for formaldehyde-containing finishes in the textile industry - Significant increase in use of chemical is expected in the textile industry - Lack of toxicity data	Deferred pending verification of use in the textile industry - Positive in *Salmonella* - Continuous breeding cancelled - Teratology completed; report- - Teratology pilot studies completed
N-Butyl Bromide 109-65-9	NCI 2001	- A mutagenic alkylating agent that suggests a strong likelihood of carcinogenic activity - A high production volume chemical with increasing usage - Identified as a drinking water pollutant	Nominated for toxicity testing - Deferred pending receipt of additional information
tert-Butyl formate 762-75-4	U.S. EPA 1996	- *t*-Butyl formate (TBF) is an environmental degradation product of methyl *tert*-butyl ether (MTBE) the most widely used motor vehicle fuel oxygenate in the U.S. - Public health complaints have been voiced regarding acute health effects related to exposure to evaporative and/or exhaust emissions from use of oxygenated gasoline	Deferred pending receipt of EPA/industry testing data - Negative in *Salmonella*
n-Butyl nitrite 544-16-1	NCI 1989	- Used as a street drug - Potential for human exposure - Positive in *Salmonella* and mouse lymphoma assays - Lack of prechronic and chronic toxicity data	Recommended for carcinogenicity; NTP performed carcinogenicity studies on isobutyl nitrite in lieu of butyl nitrite on the basis that the isobutyl nitrite is the one which is commercially available Isobutyl nitrite (542-56-3): - Subchronic inhalation completed - Carcinogenicity by inhalation published (TR-448 reports CE- MR, FR; SE- MM, FM) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells in two studies - Positive male/female micronucleus - Positive in *Salmonella* - Negative for sex-linked recessive lethal mutations in *Drosophila*
tert-Butylcatechol 98-29-3	NCI 1994	- Industrial chemical with high and increasing level of production and usage - Potential for human exposure - Suspicion of carcinogenicity	- Dosed feed prechronic completed; TOX-70. - No chronic testing planned - Chemical disposition completed; report - Negative in micronucleus assay - Negative in *Salmonella*
tetra-N-Butyltin 1461-25-2	NIEHS 1999	- Structure-activity relationship to known toxic organotin compounds - Potential widespread release into the environment	- Not being considered at this time
Buvicaine 2108-82-9	Private Individual 1994	See Local Anesthetic Compounds	See Local anesthetic compounds
Cadmium 7440-43-9	Private Individual 1994	- Cadmium is considered by the ATSDR as the sixth most important environmental chemical to human health; however, little research is being performed in the U.S. on this metal. - IARC reclassified cadmium as a Group 1 carcinogen.	Nominated for carcinogenicity testing; under review - Chemical disposition completed

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Cafestol 469-83-0	Private Individual 1998	- May raise cholesterol levels - May be a FXR antagonists	Not being considered for testing
Caffeine 58-08-2	Private Individual 1991 Private Individuals 1996	- Widespread use - Lack of mouse cancer studies - Lack of consistent epidemiological data See Naturally Occurring Chemicals in the Diet	No chronic testing; epidemiology study may be planned by NIEHS. - Prechronic dosed water study completed - Negative in *Salmonella* - Conventional teratology completed - Continuous breeding completed; report See Naturally Occurring Chemicals in the Diet
Carbaryl 63-25-2	NIEHS 1994 Private Individual 1995	See Pesticides and Kids See Carbaryl, Kelthane (Dicofol), Dursban combination exposure	See Pesticides and Kids See Carbaryl, Kelthane (Dicofol), Dursban combination exposure
Carbaryl, Kelthane (Dicofol), Dursban Combination Exposure	Private Individual 1995	- Direct dermal exposure to chemical spray resulted in severe health problems consistent with chemical exposure reports	Nomination forwarded to EPA Office of Pesticide Programs. The NTP and EPA are working to respond to concerns and to ensure that hazardous chemicals are identified and that the public exposure to them is reduced as much as possible. Dicofol (115-32-2) - Carcinogenicity dosed-feed technical report published (TR-90 reports CE- MM NE- MR, FR, FM;) - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila;* - Positive in mouse lymphoma - Negative in *Salmonella* Carbaryl (63-25-2) - Juvenile pesticide assessment completed Chlorpyrifos (Dursban) (2921-88-2) - Toxicokinetics completed - Immunotoxicity completed - Juvenile pesticide assessment completed - *Salmonella* negative
Carbon Fiber and Carbon Fiber Composite Particulate	UAW 1998 2000	- Chemicals found in the industrial environment in substantial levels	Nominated for carcinogenicity testing; under review
Carbon tetrachloride 56-23-5	State of California EPA (OEHHA) 1995	- Data gaps should be filled in order to set scientifically based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments.	No testing - lack of funding to conduct a repeat study or to fill data gaps when carcinogenicity and other study data are already available. - Cell proliferation completed - Toxicokinetic study completed - Immunotoxicity completed - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila*; - Negative *Salmonella* in two independent tests

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Carbon/Graphite Fiber Composites	UAW 1994	See Synthetic Mineral Fibers	See Synthetic Mineral Fibers
Carbonyl sulfide 463-58-1	U.S. EPA 1996	- High production chemical that is listed as a hazardous air pollutant under the Clean Air Act amendments of 1990	Selected for toxicity via inhalation (including neurotoxicity and ototoxicity), genotoxicity. Decision on chronic testing will be deferred pending results of subchronic tests. - Weakly positive in *Salmonella* - Toxicokinetics completed; report - Neurotoxicity assessment selected
[(*o*-Carboxyphenyl)-thio] ethylmercury sodium salt 54-64-8	NIEHS 1988	- Worker exposure - Potential for high consumer exposure (widely used topical anti-infective) - Lack of chronic toxicity data	Nominated for toxicity testing review; waiting for additional information from FDA - Negative in *Salmonella* - *In vitro* cytogenetics studies (CA/SCE) in progress
beta-Carotene 7235-40-7	Private Individual 1996	- Widespread human exposure through vitamin supplements and food products - Clinical trials suggest increases in lung cancer and in total mortality in participants receiving beta-carotene alone or beta-carotene plus vitamin A	Nominated for carcinogenicity testing; under review - Positive in *Salmonella*
Carrageenan 9000-07-1	Private Individual 2001	- Potential for widespread exposure; widely used food additive - Associated with development of intestinal neoplasms in animals - It would be useful to consider production of free radicals and upregulation of known oncogenes following exposure to carrageenan.	Nominated for carcinogenicity testing; under review
beta-Caryophyllene 87-44-5	NCI 1998	-Widespread human exposure - Unknown potential for adverse health effects from long-term exposure	No Testing; insufficient use to warrant testing - Negative in *Salmonella*
Catechol 120-80-9	NCI 1989	- Significant production - Widespread occurrence - Potential for high human exposure - Suspicion of carcinogenicity as a benzene metabolite	Renominated for carcinogenicity; no testing. NTP terminated the toxicity study prior to chronic testing and alternate members of class of hydroxybenzenes were selected - Negative in *Salmonella* - Negative in micronucleus assay
Cefuroxime 55268-75-2	FDA 1999	- Lack of carcinogenicity data - Potential for prolonged exposures to this drug	Selected for genotoxicity testing
Cellulose Insulation	Private Individual 1994	- Used in several applications with potential for widespread human exposure in the workplace and in the general population - Proposed as a "safe" alternative to asbestos for use in the production of asbestos cement pipe and household/industrial insulation	Selected for carcinogenicity testing
alpha-Chaconine 20562-03-2	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet

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Chloral 75-87-6	AWWARF 1991	See Water Disinfection By-Products	See Water Disinfection By-Products
Chloral hydrate 302-17-0	FDA (Center For Drug Evaluation and Research) 1991, 1999	- Widely used in pediatric medicine to sedate children for medical procedures - Evidence of carcinogenic potential in male mice In 1999, the FDA requested p53 hemizygous studies using chloral hydrate.	- Gavage subchronic completed; TOX-59 - Gavage carcinogenicity completed (TR-502 and 503) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Inconclusive results for sex-linked recessive lethal mutations in *Drosophila* - Positive in Micronucleus assay - Positive in *Salmonella* - Total reproductive capacity completed
Chlorate (Chlorate Ion) 14866-68-3	U.S. EPA, Office of Water 1995	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)
Chlordane 57-74-9 (Reagent Grade) 12789-03-6 (Technical Grade)	NIEHS 1988 Citizens Against Pesticide Misuse 1989	- Previous carcinogenicity studies considered to be inadequate - Extensive human exposure - Chlordane has a long half-life and is frequently identified in hazardous waste sites and in ground water. - Although chemical is no longer used, there is significant human exposure from contaminated homes. - Toxic effects observed in people exposed to chlordane	Nominated for carcinogenicity - NCI/NTP feeding carcinogenicity studies of analytical grade chlordane completed (TR-008) - Analytical grade was negative in *Salmonella* - Negative for CA but positive for SCE in CHO ovary cells - Technical grade was positive in *Salmonella*, and positive in mouse lymphoma assay
2-Chloro-1-propanol 78-89-7	NCI 1981 Private Individual 1997	- Human epidemiology studies have shown an association between exposure to chlorohydrins and pancreatic lesions	Selected. No testing due to the difficulty of obtaining the pure compound. A mixture of 2-chloro-1-propanol and 1-chloro-2- propanol was selected in 1984 Nominated with 2-chloroethanol (107-07-3)
3-Chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX) 77439-76-0	AWWARF 1991 NIEHS 1994 U.S. EPA, Office of Water 1995	- By-product of water chlorination - Direct-acting mutagen in *Salmonella*. Nearly 50% of the mutagenic activity of finished drinking water has been attributed to MX. See Water Disinfection By-Products-Halogenated Acetic Acids (HAAs)	Selected for carcinogenicity/toxicity in dosed water - 14-day completed - 90-day assigned - 2-year assigned - Toxicokinetics, completed - Chemical disposition, completed
2-Chloro-6(trichloromethyl)pyridine 1929-82-4	NIEHS 1999	- High U.S. production volume - Potentially high human exposure	Not under consideration at this time. - Positive in *Salmonella*
Chloroethane 75-00-3	U.S. EPA 1996	In support of EPA's air toxic risk assessments, EPA needs additional data on chloroethane to help define the inhalation dose response for carcinogenicity and to better characterize the reproductive toxicity. A repeat bioassay of chloroethane in female mice was requested to examine the dose-response relationship involved in the development of uterine tumors.	Nominated for carcinogenicity and reproductive toxicity; under review - Inhalation carcinogenicity technical report published (TR-346 reports CE- FM; EE- MR, MM; IS- FM) - Positive in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
2-Chloroethanol (Ethylene chlorohydrin) 107-07-3	Private Individual 1997	- Human epidemiology studies have shown an association between exposure to chlorohydrins and pancreatic lesions.	Nominated for carcinogenicity testing; under review - Carcinogenicity dermal technical report published (TR-275 reports NE- MR, FR, MM, FM) - Negative for chromosome aberrations - Positive for *In vitro* cytogenetics - Negative for *Drosophila* (sex-linked recessive lethal/reciprocal translocation) - Positive in mouse lymphoma - Negative in micronucleus assay - *Salmonella*: positive in 3 independent tests - Conventional teratology (intravenous), completed
bis(2-Chloroethyoxy)methane 111-91-1	NIEHS 1998	- High production volume - Lack of toxicology studies	Selected - Repeat dose completed - Toxicity/carcinogenicity assigned - Chemical disposition on test - Micronucleus negative - Positive in *Salmonella*
Chloroform 67-66-3	State of California EPA (OEHHA) 1995	- Data gaps should be filled in order to set scientifically-based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments	No additional testing will be done due to a lack of resources and prior testing, - Carcinogenicity gavage technical report published (TR-00 published 1976 reports CE- MR, MM, FM; NE- FR) - Toxicokinetic study completed - Continuous breeding, completed - Negative for chromosome aberrations - Inconclusive for chromosomal aberrations and negative for sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma in two independent tests - Positive in micronucleus assay - Negative in *salmonella* - Negative for sister chromatid exchanges
Chlorogenic acid 327-97-9	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
p-Chloro-*m*-xylenol (PCMX) 88-04-0	Private Individual 1995	- The safety of PCMX needs to be verified and essential toxicological parameters need to be established. - Manufacturer lacks funds for performing long-term toxicological tests required by FDA.	In review FDA published the Tentative Final Monograph for Health Care Antiseptic Drug Products: Proposed Rule (FR Vol. 59, No 116, pages 31402-31452) dated June 17, 1994. NTP will consider PCMX for short- and long-term tests and pharmacokinetics studies in lab animals, but NTP does not perform human studies.

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Chloropicrin 76-06-2	State of California EPA (OEHHA) 1995	- Data gaps that need to be filled in order to set scientifically-based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments	No additional testing - lack of funding to conduct a repeat study or to fill data gaps when carcinogenicity and other study data are already available. - Gavage technical report published (TR-65 reports NE- MM, FM; IS- MR, FR) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Inconclusive for sex-linked recessive lethal mutations and reciprocal translocation in *Drosophila* - Positive in *Salmonella* in two independent tests
o-Chloropyridine 109-09-1	NCI 1997	- Increasing production and use as a pharmaceutical and agrochemical intermediate - Potential for occupational and environmental exposure - Evidence of mutagenicity based on results in several short-term test systems - Suspicion of carcinogenicity based on structure and evidence of mutagenic or carcinogenic effects associated with structurally related chemicals	Selected for carcinogenicity testing - Repeated dose completed - Chemical disposition on test - Positive in *Salmonella*
Chlorothalonil 1897-45-6	State of Florida, Dept. of Health and Rehab System 1995	See Benlate DF with flusilazole and chlorothalonil	See Benlate DF with flusilazole and chlorothalonil
Chlorpyrifos (Microencapsulated) (Dursban) 2921-88-2	Citizens Against Pesticide Misuse 1989 Private Individual 1994 NIEHS 1994 Private Individual 1995 Workplace Health Services 1996	- Used as a replacement for chlordane - Toxic effects observed in people exposed to chlorpyrifos See Pesticides and Kids See Carbaryl, Kelthane (Dicofol), Dursban combination exposure	Chlorpyrifos (Dursban) (2921-88-2) - Recommended for toxicity and carcinogenicity; referred to EPA - Negative in *Salmonella* - Immunotoxicity completed - Juvenile pesticide assessment completed; referred to EPA - Toxicokinetics, completed - Immunotoxicity, completed See Pesticides and Kids See Carbaryl, Kelthane (Dicofol), Dursban combination exposure Nomination letter forwarded to U.S. EPA, currently evaluating effects from exposure to chlorpyrifos
Chromium picolinate 14639-25-9	Private Individual 1998 NCI 1998	- Potential for widespread exposure as a dietary supplement used for weight loss - Significant chromosome damage to Chinese hamster ovary cells when the rodents were exposed to a non-toxic dose	Selected for toxicity/carcinogenicity testing - Chemical disposition on test - Negative in micronucleus assay - Negative in *Salmonella*
Cimetidine 51481-61-9	Private Individual 1991	- Appears to increase SCE frequency in ulcer patients and following *in vitro* incubation of human lymphocytes. It also produces chromosomal aberrations in rodent models. - Inadequate testing for carcinogenicity	Nominated for carcinogenicity testing; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
1,8-Cineol 470-82-6	NIEHS 1996	See Synthetic Fragrances	See Synthetic Fragrances
Cinnamaldehyde 104-55-2	FDA 1989	- Important flavoring agent in food - Significant human exposure - Suspicion of carcinogenicity based on structural considerations - Lack of adequate carcinogenicity data	Selected for carcinogenicity testing - Prechronic studies completed - Short term *in vivo* reproductive toxicity (STIV) study completed - Mechanisms completed - Toxicokinetics completed - Micronucleus negative *trans*-Cinnamaldehyde (14371-10-9) - Prechronic gavage and microencapsulation completed - Chronic carcinogenicity (microencapsulation in feed, draft report, TR-514 - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Positive for sex-linked recessive lethal mutations and negative for reciprocal translocation in *Drosophila* - Negative in *Salmonella* and weakly positive in *Salmonella*
Citronellol 106-22-9	NCI 1997	- High production volume - Widespread human exposure - Unknown potential for adverse health effects from long-term administration - Significant occupational exposure	Deferred pending the results of the Citral study
Clarithromycin 81103-11-9	FDA 1999	- Widespread exposure to drug - Rapid absorption and distribution into body tissues - Lack of carcinogenicity data	Selected for genotoxicity testing -Immunotoxicity completed
Cobalt Dust	UAW 1994 Private Individual 1998	The nominator is concerned about chemicals and combinations of chemicals found in the industrial environment in substantial levels. See Metals	See Metals In review
Cobalt Metal Dust And Soluble Cobalt Chemicals	UAW 1989	- High occupational exposure - Known toxic effects of cobalt inhalation exposure as indicated from occupational inhalation studies	- Nominated for carcinogenicity Cobalt Sulfate Heptahydrate (10026-24-1): - Prechronic inhalation toxicity study published (TOX-05) - Chronic inhalation carcinogenicity study-published (TR-471) - Weakly positive in *Salmonella*
Cobalt sulfate heptahydrate 10026-24-1	UAW 1989	See Cobalt metal dust and soluble cobalt chemicals	See Cobalt metal dust and soluble cobalt chemicals
Cocaine 50-36-2	Private Individual 1994	See Local anesthetic compounds	See Local anesthetic compounds

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Comfrey and Its Alkaloids	NIEHS 1998	- Potential for chronic human exposure - Limited carcinogenicity data	Comfrey (72698-57-8) - No testing recommended Symphytine (22571-95-5) - No testing recommended Comfrey Mixture - No testing recommended
Copper and Copper Compounds	State of California EPA (OEHHA) 1995	- Lack of acute exposure data	No testing - lack of funding to conduct a repeat study or to fill data gaps when carcinogenicity and other study data are already available. Copper and inorganic compounds (7440-50-8): - Chemical disposition completed
p-Coumaric acid 7400-08-0	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Silica, Crystalline-Quartz 14808-60-7	State of California Dept. of Health Services, Health and Welfare Agency 1991 NIEHS 1994	- Widespread occurrence and human exposure - Need to substantiate carcinogenicity	Silica, crystalline - quartz (14808-60-7) Nominated for carcinogenicity - Subchronic inhalation completed - 9th Report on Carcinogens - listed as a known carcinogen
Cumene 98-82-8	NIEHS 1996	- Widespread human exposure - High production level - Lack of chronic testing	Selected for carcinogenicity testing - Subchronic completed - Chronic on test - Positive in micronucleus assay - Negative in *Salmonella*
Cumene hydroperoxide 80-15-9	NIEHS 1998	- High production volume - Absence of chronic data	Selected for carcinogenicity testing - Positive in *Salmonella*
Cyanogen chloride 506-77-4	U.S. EPA, Office of Water 1995	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)
Cyclohexene oxide 286-20-4	NCI 1993	- Present in natural products and has a wide range of uses including laboratory and production of other intermediates that have human exposure	Selected - Topical repeated dose completed - Gavage repeated dose completed - Chemical disposition completed - Negative in micronucleus assay - Positive in *Salmonella* in three independent tests; negative in another *Salmonella* test

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
2-Cyclohexene-1-one 930-68-7	NCI 1992	- A representative cyclic alpha, beta-unsaturated ketone, with broad human exposure - Potential for biological activity - Lack of chronic toxicity data	- Subchronic inhalation completed - Negative in Micronucleus assay - Negative in *Salmonella*
Cylindrospermopsin 143545-90-8	NIEHS 2000	- Cyanobacteria, a blue-green algae associated with eutrophication, and their toxins have been identified by the EPA as drinking water contaminants with high health research priority.	Nominated for carcinogenicity testing; under review
D and C Red (Numbers 27 and 28)	FDA 2001	- Concerns about photocarcinogenicity	D and C Red Number 27 (13473-26-2) - Selected for *in vitro* percutaneous absorption testing - Photocarcinogenicity testing dependent on results of human dermal absorption studies D and C Red Number 28 (18472-87-2) - Selected for *in vitro* percutaneous absorption testing - Photocarcinogenicity testing dependent on results of human dermal absorption studies
DNA-Based Products	FDA 1999	- The number of DNA-based products being submitted to the FDA is growing rapidly. - More recently, DNA vaccines and synthetic oligos have been developed for use in relatively healthy individuals, making long-term safety a dominant concern.	Selected for study
2,4-Decadienal 25152-84-5	NCI 1993	See Dienaldehydes	See Dienaldehydes
Dehydroepiandrosterone	Private Individual 1997 NCI 1998	- Dietary supplement, available over-the-counter - Promoted as a muscle builder, to slow the aging process and as a weight loss aid	Dehydroepiandrosterone sulfate (651-48-9) - Deferred pending the receipt of additional information Dehydroepiandrosterone sulfate, Sodium Salt (78590-17-7) - Deferred pending the receipt of additional information
Diacetone alcohol (DAA) 123-42-2	NCI 1993	- High production volume - Widespread and increasing use - Potential for occupational and consumer exposure to the chemical as an atmospheric and surface water contaminant, and through its uses as a solvent and food additive	Deferred in order to review data submitted by industry on methyl isobutyl ketone (MIBK), which is a precursor to diacetone alcohol. DAA will be reconsidered following review of new data on MIBK in subsequent meetings. - Negative in *Salmonella* in two independent tests
Diazoaminobenzene 136-35-6	NIEHS 1988	- Worker exposure (widely used in scientific laboratories) - Existing carcinogenicity studies (oral) were equivocal	- Subchronic completed, TOX-73 - Positive in *Salmonella* - Toxicokinetics completed

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Dibenzofuran 132-64-9	NCI 2001	- Widespread general exposure as an air pollutant generated by municipal waste incinerators and exposure via contaminated ground water - Little information on the toxicity is available	Not being considered for testing at this time.
1,2-Dibromo-2,4-dicyanobutane 35691-65-7	NIEHS 1995	See Brominated chemicals	See Brominated chemicals
Dibromoacetic acid 631-64-1	AWWARF 1991 U.S. EPA, Office of Water 1995	See Water Disinfection By-Products See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)
Dibromoacetonitrile 3252-43-5	AWWARF 1991 U.S. EPA 1997	See Water Disinfection By-Products	See Water Disinfection By-Products Selected for testing under Water Disinfection By-Products initiative - Negative in *Drosophila* (sex-linked recessive lethal/reciprocal translocation) - Weakly positive in *Salmonella* - Reproductive/developmental/general toxicity (28-day) (SCREEN) (Dosed-Water), completed - Chemical disposition, on test
1,2-Dichloro-1,1-difluoroethane 1649-08-7	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
2,3-Dichloro-1,3-butadiene 1653-19-6	NIEHS 1997	- Lack of toxicity and carcinogenicity data	Nominated for carcinogenicity testing; under review
1,3-Dichloro-2-Butene 926-57-8	NIEHS 1999	- High U.S. production volume and potentially high human exposure - Structurally similar to a known carcinogen	Selected - Deferred pending receipt of industry information
Dichloroacetic acid 79-43-6	U.S. EPA 1988 U.S. EPA, Office of Water 1995 U.S. EPA 1997	- Breakdown product of drinking water disinfectants - High human exposure - Suspicion of carcinogenicity - The EPA is in the process of developing new drinking water regulations for water disinfection by-products See Water Disinfection By-Products	See Water Disinfection By-Products and Water Disinfection Model - Positive in *Salmonella* - Spermiation inhibition (gavage): completed
Dichloroacetonitrile 3018-12-0	Private Individual 1990 AWWARF 1991	- By-product formed during disinfection of drinking water - Potential for human exposure - Soft tissue malformations, cardiovascular and urogenital anomalies observed in oral toxicity studies in laboratory animals See Water Disinfection By-Products	See Water Disinfection Byproducts - Positive in *Salmonella* - Weakly positive for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Positive for sex-linked recessive lethal mutations and negative for reciprocal translocation in *Drosophila*
p,p'-Dichlorodiphenoldichloroethylene 72-55-9	University of Cincinnati 1994	See Pesticides and Herbicides	See Pesticides and Herbicides

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Dichlorodiphenyltrichloroethane (DDT) 50-29-3	Private Individual 1994 University of Cincinnati 1994	See Pesticides and Herbicides	See Pesticides and Herbicides
1,2-Dichloroethane 107-06-2	NIEHS 1991	Study to examine class of halogenated ethanes	- Gavage, carcinogenicity technical report published (TR-055 reports CE- MR, FR, MM, FM). - Prechronic gavage and dosed water toxicity report published (TOX-04) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative in Micronucleus assay in two studies - Positive in *Salmonella*
2,4-D (2,4-Dichlorophenoxyacetic acid) 94-75-7	Private Individual 1991	Continuing interest to public health as well as to mechanisms	No chronic testing - issues being addressed and industry has conducted a chronic study. - Chemical disposition completed - Toxicokinetics study completed - Neurotoxicity assessment completed - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative in *Salmonella* in two independent studies
Dichloropropane (Propylene dichloride) 78-87-5	State of California EPA (OEHHA) 1995	- Data gaps that should be filled in order to set scientifically-based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments.	No additional testing due to limited resources and existing data from prior testing - Gavage carcinogenicity technical report published (TR-263 reports SE- MM, FM; EE- FR; NE- MR) - Negative for chromosome aberrations - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations and reciprocal translocation in *Drosophila* - Positive in mouse lymphoma - Weakly positive in *Salmonella* in two independent tests - Negative for sister chromatid exchanges
Dichloropropane and Dichloropropene	U.S. EPA 2000	- These three short-chain halogenated chemicals are listed on the EPA drinking water candidate contaminant list. - Need for additional data	1,3-Dichloropropane (142-28-9) - Deferred pending receipt of additional information 2,2-Dichloropropane (594-20-7) - Deferred pending receipt of additional information 1,1-Dichloropropene (563-58-6) - Deferred pending receipt of additional information
Dicofol 115-32-2	Private Individual 1995	See Carbaryl, Kelthane (dicofol), Dursban combination exposure	See Carbaryl, Kelthane (Dicofol), Dursban combination exposure

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Dicyclohexylcarbodiimide (DCC)/ Diisopropylcarbodiimide (DIC)	NCI 1993	- Widespread low-level exposure - Absence of data on health effects	Under consideration for further testing Dicyclohexylcarbodiimide (538-75-0) - Subchronic report, TOX-70 - Immunotoxicity testing completed - Negative in micronucleus assay; weakly positive in another micronucleus assay - Negative in *Salmonella* Diisopropylcarbodiimide (693-13-0) - Subchronic report, TOX-70 - Immunotoxicity completed - Positive in two micronucleus assays and negative in one test - Negative in *Salmonella*
Dienaldehydes	NCI 1993	- Contained in a variety of foods and food components where both are regulated as additives and flavoring agents. - Known to be lipid peroxidation products found in meat, vegetable, and fish oils. Several researchers have implied that there would be a link between exposure to lipid peroxidation products and the development of human cancers.	2,4-Hexadienal (142-83-6) - Gavage repeated dose completed - Gavage prechronic completed - Gavage chronic completed - Negative in micronucleus assay - Positive in *Salmonella* in two independent tests 2,4-Decadienal (25152-84-5) - Gavage repeated dose completed - Gavage subchronic report, TOX-70 - Gavage chronic on test - Negative in micronucleus assay - Negative in *Salmonella* in two independent tests
Diesel Fuel No. 2 68476-34-6	NIOSH 1998	- Occupational exposure - High production volume - Lack of toxicity and carcinogenicity testing data – neurotoxicity effects reported following acute inhalation vapor exposure	Nominated for toxicity and carcinogenicity testing; under review
Diethanolamine 111-42-2	UAW 1994 2000	See Machining Fluid Constituents	See Machining Fluid Constituents
Diethylamine 109-89-7	NIEHS 1997	- High production volume - Ubiquitous natural occurrence in trace amounts - Lack of sufficient chronic study data - Occupational exposure	Selected for carcinogenicity studies - Negative in *Salmonella*
N,N-Diethylhydroxylamine 3710-84-7	NCI 1999	- High production volume chemical - Significant human exposure potential - Lack of adequate carcinogenicity.data	Nominated for toxicity testing. - No testing; industry testing is adequate

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Diethylene glycol 111-46-6	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
1,2-Difluro-1,1,2,2-tetrachloroethane 76-12-0	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
N,N-Diethyl-m-toluamide 134-62-3	NIEHS 1999	- High production volume - Widespread consumer use in commercial insect repellents	Nominated for carcinogenicity testing; under review - Negative in *Salmonella*
2,5-Dimercapto-1,3,4-thiadiazole (DMTD) 1072-71-5	Chemonics industries 1994	- Lack of health-related testing data	Nominated for carcinogenicity testing; under review
Dimethyl adipate 627-93-0	U.S. CPSC 1994	- Widespread and increasing consumer exposure - Potential for occupational exposure - Limited toxicity data available	- Deferred pending results of industry studies - Equivocal in micronucleus assay - Negative in *Salmonella*
Dimethyl disulfide 624-92-0	NCI 1988	- High and increasing production volume - Increasing usage - Identified in various food stuffs, a municipal potable water supply, and in ponds, lakes, and ocean water - Potential for human exposure - Lack of toxicity data	Nominated for carcinogenicity studies - Negative in *Salmonella* in two independent tests
Dimethylaminopropyl chloride, hydrochloride 5407-04-5	NCI 1995	- Potential for human exposure because of its wide use as an industrial and research organic intermediate - Member of the nitrogen mustard-type chemical class, which is associated with genetic toxicity and DNA-damaging effects	- Subchronic studies completed - Positive in *Salmonella*
Dimethylethanolamine 108-01-0	NIEHS 1997	- Widespread use and exposure potential	No testing
Dimethylethylamine 598-56-1	Private Individual 1998	- Potential for high occupational exposure	Nominated for toxicity and carcinogenicity testing; under review
Dimethylformamide 68-12-2	Private Individuals 1991	- Need for additional studies in combination with heavy metals - High production volume and potential for widespread exposure	No additional testing; adequate rodent carcinogenicity studies performed by industry - Prechronic inhalation toxicity report published (TOX-22) - Continuous breeding completed - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* in two tests - Positive in Mouse Lymphoma; - Negative in two other Mouse Lymphoma tests - Negative in *Salmonella*
Dimethyloldihydroxyethyleneurea 1854-26-8	NIEHS 1998	See Methylolurea Class nomination	See Methylolurea Class nomination

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Dimethylolurea 140-95-4	NIEHS 1998	See Methylolurea Class nomination	See Methylolurea Class nomination
Dimethylolureadimethylether 141-07-1	NIEHS 1998	See Methylolurea Class nomination	See Methylolurea Class nomination
N,N-Dimethyl-p-toluidine 99-97-8	NCI 2000	- High production volume - Potential for widespread human exposure by inhalation and dermal contact from its use in dental materials and bone cements - Member of a class of chemicals suspected of having carcinogenic activity	Selected for subchronic toxicity testing pending review of industry test plans and or data developed under EPA's High Production Volume Chemical Challenge Program
Dioxin Toxic Equivalence Factor Studies	NIEHS/U.S. EPA 1995	The use of TEFs to predict carcinogenicity remains an unresolved concept because of the limited database on carcinogenicity of this class of compounds.	Toxic Equivalency Factor Evaluation (TCDD) (1746-01-6): - Chronic gavage on test - Gavage, technical reports (TRs 201 and 209) - Toxicokinetics, on test - Chemical disposition completed - Mechanisms completed - Cell proliferation completed Toxic Equivalency Factor Evaluation (Pentachlorodibenzo-*p*-dioxin) (40321-76-4): - No testing Toxic Equivalency Factor Evaluation (Pentachlorodibenzofuran) (57117-31-4): - Chronic gavage on test - Chemical disposition completed - Toxicokinetics on test - Teratology completed Toxic Equivalency Factor Evaluation (dioxin mixture): - Chronic gavage on test
Dioxin Toxic Equivalence Factor Studies (continued)			Toxic Equivalency Factor Evaluation (PCB 126) (57465-28-8): - Chronic gavage on test - Toxicokinetic study on test Toxic Equivalency Factor Evaluation (2,2′,4,4′,5,5′-Hexachlorobiphenyl (PCB 153)) (35065-27-1): - Chronic gavage on test Toxic Equivalency Factor Evaluation (binary mixture): - Chronic gavage on test
Dipentaerythritol 126-58-9	NIEHS 1997	- High production volume - Inadequate or no toxicity studies	Nominated for carcinogenicity; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Diphenylamine (*N*-Phenylbenzenamine) 122-39-4	Private Individual 1994	- Health concerns related to dermal and oral exposure - Need to determine toxicity of pure compound	- Negative in *Salmonella* - Carcinogenicity studies deferred pending industry toxicity and oncogenicity studies as required under FIFRA re-registration guidelines as a pesticide regulated by EPA
Diphenolic Acid 126-00-1	NCI 2001	- Expected increase in use and exposure - Very little toxicity information is available	Not being considered for testing at this time
2,2'-Dipyridyl 366-18-7	NCI 1994	- Positive in Ames assay and a suspected of being carcinogenic - Precursor of the herbicide, diquat, and a metal chelating agent	Nominated for carcinogenicity testing - No testing
C.I. Disperse Red 60 17418-58-5	NCI 1989	See Dyes	See Dyes
Dyes	NCI 1989	- Most important dye in the rosamine category of xanthene dyes - High potential for human exposure - Interest in determining the activity of the sulfonated rhodamine structure	Information to be retrieved to evaluate dyes as part of complete class C.I. Acid Red 52 (3520-42-1): Nominated for metabolism and carcinogenicity studies C.I. Disperse Red 60 (17418-58-5): - Positive in *Salmonella* - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells
Ecdysterone 5289-74-7	NCI 1993	- Concern about the use/abuse of this drug by athletes, body builders and teens - Suspected of being carcinogenic	No testing - chemical is not available in over-the-counter drugs as originally suspected and pure compound is too expensive to test
Echinacea	NCI 1998	- Potential for widespread human exposure - Lack of scientific literature supporting its safety or efficacy	- Toxicity study, in design - Immunotoxicity, on test
Endocrine Disrupter Project	NIEHS 1996	The purpose of these studies is to determine if exposures to environmental chemicals that disrupt endocrine pathways can affect reproduction or the incidence of reproductive tumors	Endocrine Disrupter (Endosulfan) (115-29-7): - Under review Endocrine Disrupter (Nonylphenol) (104-40-5): - Multigeneration studies, on test Endocrine Disrupter (Vinclozolin) (50471-44-8): - Multigeneration studies, on test Endocrine Disrupter (Genistein) (446-72-0): - Multigeneration studies, on test Endocrine Disrupter (Methoxychlor) (72-43-5): - Multigeneration studies, on test Endocrine Disrupter (Ethinyl Estradiol) (57-63-6): - Multigeneration studies, on test
Endosulfan 115-29-7	NIEHS 1996	See Endocrine Disrupter Project	See Endocrine Disrupter Project

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Epicatechin 490-46-0	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Epichlorohydrin 106-89-8	State of California EPA (OEHHA) 1995	There are data gaps that should be filled in order to set scientifically based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments.	No testing; chemical too difficult to procure or handle - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in *Salmonella*
(-)-Epigallocatechin Gallate 989-51-5	NCI 2001	Being considered as a potential cancer chemopreventive agent and therefore requires evaluation with regard to its toxicity	Nominated for subchronic toxicity testing; under review
Ethanol 64-17-5	Private Individual 1991	See Ethyl Alcohol	See Ethyl Alcohol
Ethanolamine 141-43-5	UAW 1994 Private Individual 1998	See Machining Fluid Constituents	See Machining fluid constituents, under review - Negative in *Salmonella* - Teratology pilot study completed
Ethanone, 1-(1,2,3,4,5,6,7,8-Octahydro-2,3,8,8-Tetramethyl-2-Naphthalenyl)- 54464-57-2	Private Individual 1999	- Lack of safety data - High exposure level via dermal route and the possibility of absorption	Nominated for subchronic toxicity; under review
Ethidium bromide 1239-45-8	Private Individual 1994	- Known mutagen - Lack of toxicity and carcinogenicity data - Commonly used for identification of DNA in research settings	No testing at this time - Negative in two micronucleus assays - Positive in *Salmonella*
Ethinyl estradiol and/or mestranol	Private Individual 1991	Use of oral contraceptive steroids has been associated with increased incidences of liver neoplasms in women. In many studies these compounds were concluded to be promoters of hepatocarcinogenesis.	Referred to NIEHS functional toxicology group for interest and testing consideration. Ethinyl estradiol (57-63-6) - Negative in *Salmonella* in two independent studies - Negative in micronucleus assay
Ethoxyquin 91-53-2	FDA 1990	- Used as an antioxidant in animal feed - Uncertainty concerning its toxicological effects stemming from reports of purported toxicity in dogs - Need for adequate toxicity data to re-evaluate the currently approved levels in animal feed and human food	Industry studies currently being reviewed before additional NTP testing is undertaken. - Prechronic dosed-feed studies completed - Chemical disposition, metabolism, and toxicokinetics completed - Teratology pilot studies completed - Negative in *Salmonella* - Negative in micronucleus assay - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells
Ethyl acetate 141-78-6	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Ethyl alcohol 64-17-5	NIEHS 1988 Private Individual 1991	- High human exposure - International Agency for Research on Cancer (IARC) concluded that there is sufficient evidence of carcinogenicity from alcoholic beverages in humans - Lack of good animal studies	- Carcinogenicity (dosed-water) on test - Continuous breeding studies completed - Negative in *Salmonella* Urethane/Ethanol combination study: - Subchronic dosed water toxicity report (TOX-52) - Carcinogenicity study (dosed-water) on test - Positive in male/female micronucleus assay AZT/Ethanol combination: - Continuous breeding completed
Ethyl bromoacetate 105-36-2	NCI 1996	- Potential for human exposure through its uses as a chemical intermediate - Lack of chronic toxicity data - Suspicion of carcinogenicity based on its alkylating activity	Based on the results of metabolism testing, no additional testing will be performed.
Ethyl cyanoacrylate 7085-85-0	NCI 1991	- Widespread use as consumer instant adhesive - Lack of toxicity data - Potential biological activity	Nominated for carcinogenicity testing - No further testing; rapidly polymerizes in the presence of moisture - Negative in micronucleus in two assays - Negative in *Salmonella*
Ethyl silicate 78-10-4	NCI 1997	- Potential for occupational exposures - Suspicion of carcinogenicity - Lack of a full battery of genetic toxicity tests and lack of chronic toxicity data	Nominated for carcinogenicity testing - Deferred pending the receipt of additional information
Ethyl vinyl ketone 1629-58-9	NCI 1992	- Widespread human exposure - Limited available test data on this compound - Positive mutagenicity and the formation of DNA-damage adducts	- Subchronic inhalation completed - Negative in micronucleus assay - Positive in *Salmonella*
2-Ethyl-1,3-hexanediol 94-96-2	NCI 1993	- Limited developmental toxicity studies have been completed, and the results led to EPA action resulting in voluntary cancellation of pesticide registration. It would be useful to have another study using lower doses and more animals.	Nominated for reproductive and developmental toxicity - Deferred pending an evaluation of an industry study and EPA's risk management assessment. - Negative in *Salmonella*
2-Ethyl-2-hexenal 645-62-5	NIEHS 1997	- High production volumes - Potential for human exposure - Lack of data on carcinogenicity	No further testing- -Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Ethylbenzene 100-41-4	Private Individual 1991	- High production volume - Potential for human exposure - Lack of adequate evaluation for biological or toxicological effects	- Inhalation prechronic toxicity report (TOX-10) - Inhalation carcinogenicity report (TR-466 report) - Toxicokinetics study completed - Teratology completed - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in Mouse Lymphoma - Negative in Micronucleus assay - Negative in *Salmonella* - Negative in *Salmonella*
Ethylene 74-85-1	Private Individual 1991	- High production volume - Potential for human exposure - Lack of adequate evaluation for biological or toxicological effects	No further consideration at this time
Ethylenebis(tetrabromophthalimide) 32588-76-4	NIEHS 2000	- High production volume - Potential for human exposure as a flame retardant in plastics and fabrics	Deferred pending receipt of industry test data - Negative in *Salmonella*
di-2-Ethylhexanol 68915-36-6	UAW 1994	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions
2-Ethylhexanol 104-76-7	Private Individual 1998	- Potential for occupational exposure	In review - Negative for chromosome aberrations and sister chromatid exchanges - Negative in *Salmonella*: - Teratology completed
2-Ethylhexyl 2-cyano-3,3-diphenyl acrylate 6197-30-4	NCI 1990	- Nomination resulted from a class study of sunscreen ingredients - Potential for human exposure - Suspicion of carcinogenicity based on structural considerations (presence of 2-ethylhexyl and acrylate moieties)	Withdrawn by nominator based on adequate industry testing. - Negative in *Salmonella*
2-Ethylhexyl *p*-methoxycinnamate 5466-77-3	NCI 1990	- Nomination resulted from a class study of sunscreen ingredients - High usage - Potential for human exposure - Available toxicity studies implicated the chemical as a potential tumor promoter - Suspicion of carcinogenicity based on structural considerations (presence of 2-ethylhexyl and cinnamaic moieties)	Nominated for carcinogenicity studies; under review - Negative in *Salmonella*
1,1-Ethylidenebis(tryptophan) 132685-02-0	Private Individual 1997	- Need to determine if microcontaminants were responsible for illnesses such as eosinophilia-myalgia syndrome (EMS)	Nominated for carcinogenicity studies; under review
Fire-Trol PSF (Proprietary Mixture)	Chemonics Industries 1994	- Insufficient data exists on this chemical mixture	Nominated for carcinogenicty testing - No testing - the NTP will not test proprietary products.

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Flea/Tick Pesticides	Private Individual 1995	- Increase in use of these chemicals to eradicate fleas and ticks on dogs	Pyrethrin (584-79-2) No testing - referred to EPA Permethrin (52645-53-1) No testing - referred to EPA Precor (40596-69-8) No testing - referred to EPA Carbamate (302-11-4) No testing - referred to EPA
Flour Dust	UAW 1994	See Organic particulate	See Organic particulate
Fluasterone 112859-71-9	NCI 1998	- Fluasterone may be used in clinical trials. Rigorous testing to demonstrate Fluasterone's safety and efficacy is needed.	Selected for toxicological studies - Deferred; industry sponsor responsible for toxicological testing
Fluorosilicates	Private Individual 1999	- Use as drinking water fluoridation agent is increasing - Lack of testing data demonstrating its safety	Hexafluorosilicic Acid (16961-83-4) Nominated for carcinogenicity; under review Sodium Hexafluorosilicate (16893-85-9) Nominated for carcinogenicity; under review
Folic acid 59-30-3	Private Individual 1994	Toxicologic effects of excess folate in humans	Nominated for toxicologic effects of excess folate in humans; under review - Negative in *Salmonella*
Formaldehyde 50-00-0	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions; under review - Prechronic inhalation completed - Positive for chromosome aberrations and positive for sister chromatid exchanges - Positive in *Drosophila* sex-linked recessive lethal test; negative in two and positive in two reciprocal translocation test - Positive in *Salmonella* (5 tests) - Weakly positive in *Salmonella* (2 tests) - Conventional teratology completed
Freon 113 76-13-1	UAW 1994 Private Individual 1998	See Organic Solvents	See Organic Solvents

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Fuel Additives (ETBE And TAME)	Health Effects Institute 1995	- Use expected to increase with the introduction of reformulated gasoline - Increase in number of people exposed to ethers - Lack of health effects information for ethers such as ETBE and TAME	Nominated for carcinogenicity testing - Deferred pending receipt of industry testing data 2-Methyl-2-ethoxypropane (ETBE) (637-92-3) - Negative in micronucleus assay - Negative in *Salmonella* tertiary-Amyl methyl ether (TAME) (994-05-8) - Negative in *Salmonella*
Fumonisin B1 116355-83-0	FDA 1991	- Concern about adverse effects of fumonisins on animal health - Potential toxic effects of fumonisin residues on humans consuming animals exposed to contaminated corn products	- Dosed-feed carcinogenicity study report, TR-496 - Teratology study completed
2-Furancarboxylic acid 88-14-2	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Gasoline Exhaust Particulate	UAW 1994 2000 Private Individual 1998	- Diesel particulate is clearly carcinogenic in rats. Parallel studies with gasoline engine exhaust particulate are lacking.	Nominated for carcinogenicity testing; under review
Genistein 446-72-0	NIEHS 1996	See Endocrine Disrupter Project	See Endocrine Disrupter Project
Ginkgo Biloba Extract 90045-36-6	NCI 1998	- Potential for widespread exposure through use as a dietary supplement - Some ingredients in GBE are known mutagens	Selected for toxicity testing.
Ginseng 50647-08-0 Ginsana™	NCI 1999	- Widespread use as a dietary supplement - Lack of toxicity information - Possibility that ginseng and ginsenosides may have anticarcinogenic activity	Selected Ginsana™ will be tested in place of ginseng Ginsana™ selected for reproductive and neurotoxicity testing, carcinogenicity
Glutaraldehyde 111-30-8	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
Glycidamide 5694-00-8	Private Individual 1992	- Glycidamide is a metabolic product of acrylamide, a known carcinogen in mice - It would be of great value if carcinogenicity testing could be performed ideally in the same strains of animals as acrylamide	No additional testing; compound too difficult to procure and handle - Dominant lethal (male), completed - Heritable translocation test, completed
Glycolic acid 79-14-1	FDA 1997	- Widespread use of skin care products - Concern about health effects, especially from long-term use - Product manufacturers have not demonstrated the safety and efficacy of the products prior to marketing	Selected for toxicity and carcinogenicity testing - On test

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Glycoluril 496-46-8	NCI 1997	- Potential for human exposures in the workplace and in the general population - Lack of toxicity data - Suspicion of carcinogenicity based on potential for nitrosation on one of the ring amino groups to form nitrosamides	Selected for testing - In study design
Glyoxal 107-22-2	U.S. EPA, Office of Water 1995	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products- Halogenated Acetic Acids (HAAs)
Goldenseal 84603-60-1	NIEHS 1998	- Potential for human exposure - Lack of chronic or carcinogenicity data	Goldenseal (84603-60-1) - Powdered root selected for toxicity and developmental toxicity testing - Dosed feed, on test - Conventional teratology, on test - Teratology pilot studies, completed Hydrastine (118-08-1) - No testing; chemical too difficult to procure
Grape Seed And Pine Bark Extracts	NCI 2001	- Widespread use as dietary supplement - The health claims for grape seed and pine bark extracts include studies showing tumor inhibition. Given their potential benefits and the lack of testing data, toxicity testing of these extracts appears warranted.	Nominated for subchronic, reproductive and developmental toxicity; under review
Halazone 80-13-7	NIEHS 1988	- Potential for high consumer exposure - Water disinfectant - Lack of chronic toxicity data - Positive in *Salmonella*	Nominated for toxicological testing - No further testing - Positive in *Salmonella*
Halogenated Aldehydes Class	AWWARF 1991	- Widespread exposure - Lack of adequate carcinogenicity testing	Under consideration with other water disinfection by-product chemicals
Halogenated Ethanes Class Study	NIEHS 1991	Study to examine class of halogenated ethanes	Hexachloroethane (67-72-1): - Two gavage carcinogenicity technical reports published (TR-68 reports CE- MM, FM; and TR-361 reports CE- MR; NE- FR) - Subchronic gavage study report (TOX-45) - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative in *Salmonella* in two independent tests

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
			Pentachloroethane (76-01-7): - Gavage carcinogenicity technical report (TR-232 reports CE- MM, FM; EE- MR; NE- FR) - Subchronic gavage study report (TOX-45) - Negative for chromosome aberrations - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Positive in mouse lymphoma - Negative in micronucleus assay - Negative in *Salmonella*
Halogenated Ethanes Class Study (continued)			1,1,1-Trichloroethane (71-55-6): - Gavage carcinogenicity technical report (TR-3) - Subchronic gavage study report (TOX-41) - Chemical disposition completed - Mechanisms completed - Teratology completed - Positive for chromosomal aberrations and inconclusive for sister chromatid exchanges in Chinese hamster ovary cells - Negative and inconclusive in mouse lymphoma - Negative in *Salmonella* in four independent tests 1,1,1,2-Tetrachloroethane (630-20-6): - Gavage carcinogenicity technical report (TR-237 reports CE- MM, FM; EE- MR; NE- FR) - Subchronic gavage study report (TOX-45) - Positive for chromosome aberrations - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative in mouse lymphoma and positive in another study - Positive in micronucleus assay - Negative in *Salmonella* in two independent tests
Halogenated Ethanes Class Study (continued)			1,1,2,2-Tetrachloroethane (79-34-5): - Gavage technical report published (TR-27 reports CE, MM FM; EE, MR; NE, FR) - Prechronic microencapsulation in feed study completed and in review - Prechronic gavage completed - Subchronic gavage study report (TOX-45) - Teratology pilot studies completed - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in Drosophila - Negative in mouse lymphoma - Positive in micronucleus assay - Negative in *Salmonella* in two independent tests

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
			1,1,2,2-Tetrabromoethane (79-27-6): - Subchronic gavage study completed (TOX-45) - Chemical disposition completed - Metabolism completed - Negative in *Salmonella* 1,1,1,2-Tetrabromoethane (630-16-0): - Subchronic gavage study completed (TOX-45) - Weakly positive in *Salmonella*
Halogenated Ethanes Class Study (continued)			1,1,1-Trichloro-2,2,2-trifluoroethane (354-58-5): - Subchronic gavage study completed (TOX-45) 1,2-Dichloro-1,1-difluoroethane (1649-08-7): - Subchronic gavage study completed (TOX-45) - *Salmonella* on test 1,2-Difluro-1,1,2,2-tetrachloroethane (76-12-0): - Subchronic gavage study completed (TOX-45) - Weakly positive in *Salmonella* Pentabromoethane (75-95-6): - Subchronic gavage study completed (TOX-45) - Negative in *Salmonella*
Halogenated Ketones Class	AWWARF 1991	- Water disinfection by-product with wide exposure - Lack of adequate carcinogenicity testing	Under consideration with other water disinfection byproduct chemicals
2,2′,4,4′,5,5′-Hexachlorobiphenyl (PCB 153) 35065-27-1	NIEHS/ U.S. EPA 1995	See Dioxin Toxic Equivalence Factor Studies	See Dioxin Toxic Equivalence Factor Studies
1,3-Hexachlorobutadiene 87-68-3	State of California EPA 2001	- Insufficient data to clearly determine whether 1,3-hexachlorobutadiene is carcinogenic	Nominated for carcinogenicity testing; under review - Dosed-feed study report (TOX-01) - Toxicokinetics study completed - *In vitro* cytogenetics: negative in chromosome aberrations and positive in sister chromatid exchanges - Negative in *Drosophila* sex linked recessive lethal/reciprocal translocation - Negative in *Salmonella* - Conventional teratology completed
Hexachloroethane 67-72-1	NIEHS 1979	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
2,4-Hexadienal 142-83-6	NCI 1993	See Dienaldehydes	See Dienaldehydes

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Hexamethyldisilazane 999-97-3	Private Individual 1988 Private Individual 1990	- Used in semiconductor industry - Potential for worker exposure - Lack of chronic toxicity data - Potential for significant human exposure - Lack of toxicological data	No testing; originally selected for general toxicology studies but withdrawn due to its high reactivity and the fact that it is a severe irritant - *In vitro* cytogenetics: negative for chromosomal aberrations (CA), not tested in sister chromatid exchanges (SCE) - Negative in *Salmonella*
n-Hexane 110-54-3	Private Individual 1991	- Continuing interest in health-related effects as well as to potential mechanisms	No further testing. Industry-conducted inhalation study documents reviewed by NTP and determined that hexane has been adequately tested in rats and mice. - Prechronic inhalation toxicity technical report (TOX-02) - Teratology completed - Dominant lethal completed - Neurotoxicity assessment completed - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative in micronucleus assay - Negative in *Salmonella*
1,6-Hexanediamine dihydrochloride 6055-52-3	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions; under review - Subchronic toxicity technical report, (TOX-24) - Negative in micronucleus:assay
Hexavalent Chromium Compounds 7789-12-0	California: - Congressman Schiff (10/26/2000) - Drs. Denton and Bonta (2/15/2001) - Congressional Delegation (3/12/2001)	- Definitive data are needed on whether hexavalent chromium administered in drinking water is carcinogenic.	Selected for toxicity and carcinogenicity testing. Sodium Dichromate Dihydrate (7789-12-0) - In study design
trans-2-Hexenal 6728-26-3	Private Individual 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Hydralazine hydrochloride 304-20-1	Private Individual 1997	- Widespread exposure to antihypertensive drug - Suspected of being a carcinogen based on mutagenicity data and positive mutagenicity and carcinogenicity data in animals for structurally related compounds. - Lack of complete and adequate 2-year bioassay data for hydralazine hydrochloride	Nominated for carcinogenicity testing; under review
Hydrastine 118-08-1	NIEHS 1998	See Goldenseal	See Goldenseal

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Hydrazine 302-01-2	NASA, Lyndon B. Johnson Space Center 1991	- Shown to cause nasal tumors in rats and possibly lung adenomas in mice; however, the concentrations at which those effects were observed is quite uncertain. - Quality data lacking to set exposure levels for spacecraft as well as ground-based operations	Nominated for carcinogenicity testing; under review
[Hydrogen cyanide] Hydrocyanic acid 74-90-8	Private Individual 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Hydrogen fluoride 7664-39-3	State of California EPA (OEHHA) 1995	There are data gaps that should be filled in order to set scientifically based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments.	No testing; lack of funding to conduct a repeat study or to fill data gaps when carcinogenicity and other study data are already available.
Hydrogen sulfide and Sulfide Liberating Compounds	Private Individual 1996	- Highly toxic chemical and no known antidote - Widespread industrial use	Hydrogen sulfide (7783-06-4): Nominated for toxicity; under review
Hydroquinone 123-31-9	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers.
5-(Hydroxymethyl)furfural (HMF) 67-47-0	NIEHS 1995	- 5-(Hydroxymethyl)furfural (HMF) is a thermal decomposition product of sucrose, and has been identified in a wide variety of heat processed foods. HMF has mutagenic and DNA strand breaking activity - No long-term studies have been reported on HMF	Selected - Subchronic gavage completed - Chronic gavage on test - Chemical disposition completed
Hypericin 548-04-9	NCI 1998	- Increasing usage as a readily available self-medication for depression. It is also widely used to promote the healing of wounds.	Nominated for carcinogenicty testing - Deferred pending NTP evaluation of industry carcinogenicity testing
Imidacloprid 138261-41-3	Texas Dept. of Health 1995	- Imidacloprid is a new pesticide that is expected to have widespread home and commercial use.	Nominated for toxicity testing; under review pending receipt of information from the EPA regarding this pesticide
Indole 120-72-9	NASA, Lyndon B. Johnson Space Center 1991	- Spacecraft maximum allowable concentrations (SMACS) are required for indole as design criterion for the air revitalization system of the space station - Toxicological database is limited - Old studies indicate leukemogenic	Nominated for carcinogenicity testing; under review pending receipt of exposure information.
Indole-3-Carbinol 700-06-1	NCI 1999	- Under review at NCI as a chemopreventive agent for breast cancer - Marketed as a dietary supplement with projected rapid growth in sales - Substantial evidence exists that indole-3-carbinol can reduce the risk of cancers induced by several carcinogens when administered to animals.	Selected for toxicity and carcinogenicity studies
Insect Repellent Class	Private Individual 1991	- Widespread use by military in SE Asia, possible initiator of lupus and similar conditions.	Nominated for carcinogenicity testing; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Iodotrifluoromethane (CF_3I) 2314-97-8	Private Individual 1993	- A fire-extinguishing agent being considered for use by the U.S. Air Force as a replacement for halon - No literature is present on the biological effects of the chemical - Computational methods and physical measurements done at Johns Hopkins predict that CF3I would be a potent hepatocarcinogen.	Nominated for carcinogenicity testing; under review
Ipomeamarone 494-23-5	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Iron	Private Individual 1994	- Potential for widespread exposure; common contaminant in ground water and drinking water, common food additive and occupational hazard. - Recent studies indicate serious health effects from excess iron. - Increases the toxicity of dioxin by 100%	In review
Irradiated Meats	Private Individual 2000	- Based on recent proposals to alter labeling requirements for irradiated foods (changing 'irradiated' to 'electronic pasteurization'), it is important that the NTP provide relevant data on this issue.	Nominated for toxicity testing; under review
Isoamyl acetate 123-92-2	NIEHS 1994 Private Individual 1996	- High production volume - Widespread use as a food additive - Previously reported oral and subchronic studies of isoamyl acetate in Wistar rats indicated a possible carcinogenic response	No further testing - Toxicokinetics, completed - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative in *Salmonella*
Isoamyl nitrite 110-46-3	NCI 1989	- Used as a street drug - Potential for high human exposure - Lack of epidemiological data and adequate toxicity studies in animals	- Nominated for carcinogenicity; under review - Positive in *Salmonella* - Positive for CA and SCE in CHO cells
Isobutyl alcohol 78-83-1	Private Individual 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Isobutyl nitrite 542-56-3	NCI 1989	See n-Butyl nitrite	See n-Butyl nitrite
Triallyl isocyanurate 1025-15-6	NIEHS 1998	- Lack of toxicity data - Moderate volatility which enhances the potential for exposure - Potential release of allyl alcohol during the formulations of some rubber compounds	No testing - Negative for CA and SCE in CHO cells - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Isocyanuric acid 108-80-5	NIEHS 1997	- Widespread exposure of the general population through use in formulation for common household cleaners, and for swimming pool disinfection	No testing - Negative in *Salmonella*
Isophorone 78-59-1	NIOSH 1990	- Potential for occupational exposure - Lack of epidemiological studies and animal inhalation toxicity data - Evidence of carcinogenicity in male mice and rats in a 2-year gavage study	Nominated for inhalation studies; not being considered at this time - Carcinogenicity gavage technical report published (TR-291 reports SE- MR; EE- MM; NE- FR, FM) - Negative in *Salmonella* - Positive in mouse lymphoma - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative for chromosome aberrations - Negative for sister chromatid exchanges - Negative for CA and positive for CE in CHO cells
Isopropenyl acetate 108-22-5	NCI 1995	- Potential for human exposure based on its use pattern	No testing; anticipated metabolism to acetic acid and acetone - Negative in *Salmonella*
Isopropylamine 75-31-0	NIEHS 1997	- High production volume - Ubiquitous natural occurrence - Lack of chronic study data	Deferred; irritant properties similar to those of TEA and DEA. - Negative in *Salmonella*
Juglone 481-39-0	NCI 2000	- Potential chemotherapeutic or chemopreventive agent	Juglone (Pure) - No testing Black Walnut Extract/Juglone - Selected for subchronic and chronic toxicity testing
Kahweol 6894-43-5	Private Individual 1998	- Ability to raise cholesterol levels in humans and to activate the nuclear receptor FXR	No testing
Kava Kava Extract 9000-38-8	NCI 1999	- Widespread use - Promoted as a substitute for ritilin in children - Insufficient toxicity data available	Selected for carcinogenicity, subchronic toxicity, neurotoxicity, reproductive toxicity, and genotoxicity
Lactic acid 50-21-5	FDA 1997	- Widespread consumer exposure to cosmetic products containing alpha-hydroxy acids - Safety and efficacy of products have not been demonstrated.	- No testing - salicylic acid will be tested in place of lactic acid.
Lemon Oil and Lime Oil	FDA 2001	- Widespread consumer exposure from use of fragrances and cosmetics containing lemon and lime oil - Studies have shown that lemon and lime oil are phototoxic. - Safe use levels have been recommended for avoiding short-term phototoxicity, but long-term use and effects have not been addressed.	Lemon Oil (8008-56-8) - Selected for photogenotoxicity testing - Photocarcinogenicity testing dependent on results of photogenotoxicity testing Lime Oil (8008-26-2) - Selected for photogenotoxicity testing - Photocarcinogenicity testing dependent on results of photogenotoxicity testing

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Leucomalachite Green 129-73-7	FDA 1993	See Malachite Green	See Malachite Green
Lidocaine 137-58-6	NCI 1992	- Significant human exposure; widely used as local anesthetic and arrhythmic agent - Lack of carcinogenicity data	No testing. Because it is used on a short-term basis, the amount of the drug to which humans are exposed is low; the metabolism data indicated that lidocaine is metabolized to 2,6-xylidine, a known animal carcinogen at low levels.
Linalool 78-70-6	NCI 1997	- High production volume - Widespread human exposure - Unknown potential for adverse health effects from long-term administration - Significant occupational exposure	Deferred pending results from citral and beta-myrcene studies - Negative in *Salmonella*
Lindane 58-89-9	University of Cincinnati 1994	See Pesticides and Herbicides	See Pesticides and Herbicides
Local Anesthetic Compounds	Private Individual 1994	- Need for evaluation in long-term studies - Concern re metabolic conversion to aniline	Acetaminophen (4-Hydroxyacetanilide) (103-90-2): - No additional testing - Dosed feed carcinogenicity technical report published (TR-394 reports EE- FR; NE- MR, FR, FM) - Continuous breeding completed - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative in *Salmonella* Metronidazole (443-48-1): - No testing - Positive in *Salmonella* - IARC has classified as a Group 2B carcinogen – sufficient information available; it will not be considered for testing by NTP

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Local Anesthetic Compounds (Continued)			Lidocaine (137-58-6): - No testing because it is used on a short-term basis, the amount of the drug to which humans are exposed is low and the metabolism data indicated that Lidocaine is metabolized to a known animal carcinogen at low levels. Mepivicaine (96-88-8): - No testing Buvicaine (2108-82-9): - No testing Prilocaine (721-50-6): - Selected for *in vivo* mutation studies Procaine (59-46-1): - Received Propoxycaine (550-83-4): - Received Benzocaine (94-09-7): - Received Cocaine (50-36-2): - No testing Articaine (23964-58-1): - Received
Luminol 521-31-3	Private Individual 1996 Private Individual 1997	- Used as a forensic tool for locating trace blood residues at the crime scene - Lack of toxicity testing	No additional testing - Metabolism study completed. Testing showed a lack of absorption from skin and rapid metabolism and elimination of oral doses as nontoxic metabolites. - Negative in *Salmonella* - Negative in micronucleus assay

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Machining Fluid Constituents	UAW 1994 1998 2000	The UAW is concerned about chemicals and combinations of chemicals (including particulates) found in the industrial environment in substantial levels. The UAW nominations are intended to assist in evaluating hazards and setting standards for inhalation exposure	Mineral Oil (8012-95-1) - In review Petroleum Sulfonates (61789-85-3) - In review Triethanolamine (102-71-6) - In review - Subchronic dosed-water, topical, and inhalation studies completed - Carcinogenicity topical technical report published (TR-449 reports EE- MR; NE- FR; IS- MM, FM) - Immunotoxicity completed - Teratology pilot completed - Chemical disposition completed - Negative for chromosomal aberrations and sister chromosome exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila*; - Negative in micronucleus assay (M/F) - Negative in *Salmonella* Ethanolamine (141-43-5) - In review Non-Ionizing Surfactants - In review
Malachite Green 569-64-2	FDA 1993	- Strong potential for bioaccumulation in fish grown for human consumption - Potential for exposure through recreational activities and drinking water	Malachite green (569-64-2) - Dosed-feed repeated dose study completed - Chronic study completed (report due 12/02) - Negative in two independent micronucleus assays - Negative in *Salmonella* Malachite green oxalate (2437-29-8): - Negative in micronucleus assay - Negative in *Salmonella* Leucomalachite green (129-73-7): - Dosed-feed repeated dose study completed - Chronic study completed (report due 12/02)
Malachite Green oxalate 2437-29-8	FDA 1993	See Malachite Green	See Malachite Green
Malathion 121-75-5	Private Individual 1994	See Pesticides	See Pesticides

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Maleic Anhydride 108-31-6	State of California EPA (OEHHA) 1995	- Lacks acute exposure data	No testing. No resources to do acute inhalation testing; many anhydrides already tested - Negative in *Salmonella*
Marijuana Smoke 8063-14-7	Private Individual 1996 2000	- Need to investigate health effects - Carcinogenic potential of marijuana smoke	No further consideration at this time.
MBT (2-Mercaptobenzothiazole) 149-30-4	Private Individual 1994	- Used in the formulation of pesticides - Need for additional animal testing	No additional testing; extensively tested by NTP. - Gavage carcinogenicity technical report published (TR-332 reports SE- MR, FR; EE- FM; NE- MM) - Immunotoxicity completed - Negative in *Salmonella* assay and inconclusive in another independent test - Positive in mouse lymphoma - Positive for sister chromatid exchanges in Chinese hamster ovary cells; not tested for chromosomal aberrations - Positive for chromosomal aberrations in Chinese hamster ovary cells; not tested in sister chromatid exchanges - Negative in two independent micronucleus assays
Medicinal Herbs	Private Individual 1997	- Potential for widespread exposure to herbal products - Toxicity of ingredients should be tested	Nominated for toxicity testing; under review
Melatonin 73-31-4	NIEHS 1996	- Potential for widespread exposure from use as an over-the-counter hormone supplement as well as being used as a chemotherapeutic agent in cancer. - Lack of toxicity testing including ocular toxicity	Selected for limited short-term testing with emphasis on ocular toxicity. - Subchronic (14 and 90 day) gavage (methylcellulose) study, on test - Repeated dose gavage (water) study, completed - Teratology pilot study, completed - Conventional teratology, completed Prevention 1 (Melatonin) - Completed subchronic gavage study Prevention 2 (Melatonin) - Completed subchronic dosed-feed study Prevention 3 (Melatonin) - Completed subchronic dosed-feed study Prevention 4 (Melatonin) - Completed subchronic dosed-feed study Prevention 5 (Melatonin) - Completed subchronic dosed-feed study

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Menthofuran 494-90-6	NIEHS 1998	- Potential for human exposure; component of pennyroyal - Lack of carcinogenicity data	- No testing; major metabolite of pulegone and no need to test it separately. - Negative in *Salmonella*
Menthyl anthranilate 134-09-8	NCI 1990	- Nomination resulted from a class study of sunscreen ingredients - Used in many combination products - Potential for human exposure - Lack of toxicity data	- Nominated for carcinogenicity studies; in review - Consult with FDA concerning all sunscreens
Mepivicaine 96-88-8	Private Individual 1994	See Local anesthetic compounds	See Local anesthetic compounds
Metals	UAW 1994	The UAW is concerned about chemicals and combinations of chemicals (including particulates) found in the industrial environment in substantial levels. The UAW nominations are intended to assist in evaluating hazards and setting standards for inhalation exposure.	Welding fume (copper, zinc, lead oxide) - In review Cobalt dust - In review
Metal Working Fluids	NIOSH 2001	- High production volume - Potential for significant occupational exposure - Lack of carcinogenicity and chronic toxicology data for this class of mixtures	Nominated for toxicity testing; under review
Methanol 67-56-1	U.S. EPA 1989 Private Individual 1991	- Potential for significant human exposure if methanol is used as an alternative fuel for vehicles - Data needed to determine the toxicity of methanol at low environmental levels of exposure and to evaluate health effects	No additional testing - Mechanisms, completed - Metabolism, completed - Teratology, completed - Inconclusive in *Salmonella*
Methoxychlor 72-43-5	NIEHS 1994 NIEHS 1996	See Pesticides and Kids See Endocrine Disrupter Project	See Pesticides and Kids See Endocrine Disrupter Project
Methyl bromide 74-83-9	State of California EPA (OEHHA) 1995	- Testing needed to fill data gaps in order to set scientifically based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments.	No additional testing - Two prechronic inhalation studies completed - Inhalation carcinogenicity technical report published (TR-385 reports NE- MM, FM) - Two chemical disposition studies completed - Neurotoxicology assessment, completed - Two teratology studies completed - Positive in *Salmonella* - Positive in micronucleus assay
Methyl ethyl ketone peroxide 1338-23-4	UAW 1994 Private Individual 1998	The nominator is concerned about chemicals and combinations of chemicals found in the industrial environment in substantial levels.	No additional testing - Topical short-term toxicity report (TOX-18 published 1993) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Negative in micronucleus assay (M/F) - Positive in *Salmonella* and negative in another independent test

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Methyl glyoxal 78-98-8	U.S. EPA, Office of Water 1995	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)
Methyl Soyate 67784-80-9	NCI 2001	- Exposure may increase if methyl soyate is used as an industrial solvent to substitute for chlorinated hydrocarbon and fluorocarbon solvents. - Lack of toxicity testing	Deferred pending receipt of additional information
Methyl styryl ketone 122-57-6	NCI 1994	- Potential for worker and consumer exposure - Positive in Ames assay in strain TA100 with S-9 activation	No testing - Negative in micronucleus assay - Positive in *Salmonella* Methyl *trans*-styryl ketone (1896-62-4): - On test prechronic dosed-feed and topical studies - Chemical disposition completed - Two metabolism studies completed
Methyl *tert*-butyl ether 1634-04-4	NIOSH 1990 State of Alaska, Dept. of Health and Social Services 1994 UAW 2000	- Potential for worker and consumer exposure - Lack of animal toxicity data - Adverse health effects	Deferred pending receipt of industry testing data - Negative in micronucleus assay - Negative in *Salmonella*
2-Methyltetrahydrofuran 96-47-9	NCI 2001	- Use as an alternative fuel is expected to increase - Lack of toxicity testing	Nominated for toxicity and carcinogenicity studies; under review
Methyl vinyl ketone 78-94-4	NCI 1992	- Suspicion of carcinogenicity	- Subchronic inhalation completed - Micronucleus assay, inconclusive - Inconclusive male and negative female micronucleus assay - Positive in *Salmonella*
3-Methyl-1,2-benzenediol 488-17-5	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
2-Methyl-2-ethoxypropane (ETBE) 637-92-3	Health Effects Institute 1995	See Fuel additives	See Fuel additives
Methylal 109-87-5	NCI 1997	- High production volume and potential for occupational exposures - Potential for general population exposures based on use as a solvent in consumer products and occurrence in environment - Suspicion of carcinogenicity based on potential for metabolic release of formaldehyde and positive mutagenicity data - Lack of chronic toxicity data	Deferred pending receipt of production, use, exposure, and health effects data - Negative in *Salmonella*
Methylamine 74-89-5	Private Individuals 1996 NCI 1996	- Potential for occupational and consumer exposure - Suspicion of carcinogenicity - High production volume chemical present in many consumer products and the environment	Not under consideration at this time - Positive in mouse lymphoma - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Methylene Blue 61-73-4; 7220-79-3	NCI 1989	- Widely used to treat manic depressives and to counteract nitrate poisoning - High potential for human and animal exposure - Lack of adequate toxicity data	Methylene Blue (61-73-4) No testing Methylene Blue Trihydrate (7220-79-3) - Two prechronic gavage studies completed- - Carcinogenicity gavage study on test - Toxicokinetic study on test - Two teratology studies completed - Two teratology pilot studies completed - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative in micronucleus - Positive in *Salmonella*
4-Methylimidazole 822-36-6	NCI-CSWG 1991	- Widespread use in food products - Potential for widespread exposure - Lack of chronic toxicity data - Suspicion of carcinogenicity	- Prechronic dosed-feed study completed - Dosed-feed carcinogenicity study on test - Toxicokinetic study completed - Negative in micronucleus assay in three independent tests - Negative in *Salmonella* in two independent tests
Methylolurea Class Study	NIEHS 1998	- High production volumes (including urea-formaldehyde resins which contain methylolurea or dimethylolurea as impurities) - Potential for human exposure - Lack of carcinogenicity data	Methylolurea (1000-82-4) - Nominated for toxicological characterization; under review Dimethyloldihydroxyethyleneurea (1854-26-8) - Chemical disposition, completed - Toxicokinetics, completed - Negative in *Salmonella* - Positive in *Salmonella* - Positive in Drosophila sex-linked recessive lethal and negative in reciprocal translocation assays Dimethylolurea (140-95-4) - No further consideration at this time Dimethylolurea dimethyl ether - No further consideration at this time
N-Methylpyrrolidone (*N*-methyl-α-pyrrolidinone) 872-50-4	Private Individual NIEHS U.S. CPSC 1988	- High production volume - Worker exposure - Used in semi-conductor industry - Potential for increased use as a solvent - Lack of chronic toxicity data	- Referred to EPA for industry testing - Chemical disposition completed - Metabolism completed - Negative in *Salmonella* in two independent tests
Metronidazole 443-48-1	Private Individual 1994	See Local anesthetic compounds	See Local anesthetic compounds

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Microcystin LR	NIEHS 2000	Microcystin, a toxin produced by blue-green algae associated with eutrophication, has been identified by the EPA as a drinking water contaminant with high health research priority.	Selected for subchronic toxicity, carcinogenicity, reproductive toxicity, and toxicokinetic testing
Milk Thistle Extract 84604-20-6	NCI 1999	- Used as a dietary supplement; potential for widespread consumer exposure - Limited information on its safety	On test for subchronic toxicity and carcinogneicity testing - Negative in *Salmonella* assay and positive in another independent test
Mineral Oil 8012-95-1	UAW 1994 Private Individual 1998	See Machining fluid constituents	See Machining fluid constituents
Mineral Particulate	UAW 1994 2000	The UAW is concerned about chemicals and combinations of chemicals (including particulates) found in the industrial environment in substantial levels. The UAW nominations are intended to assist in evaluating hazards and setting standards for inhalation exposure.	Talc (14807-96-6): NIOSH assistance requested in evaluating nomination from the standpoint of occupational exposure - Inhalation carcinogenicity technical report published (TR-421 reports CE- FR; SE- MR; NE- MM, FM)
Monoethanolamine (Ethanolamine) 141-43-5	Private Individual 1991	- Widely used in cosmetic preparations and other commercial products - Caused toxic responses at multiple organ sites in prechronic studies	No further testing of monoethanolamine - Short-term *in vivo* reproductive toxicity completed - Teratology pilot studies completed - Negative in *Salmonella*
Myristicin 607-91-0	NCI 1997	- Potential for widespread human exposure through foods and beverages - Limited testing data - May have the potential to be both a carcinogen and an anti-carcinogen	Selected for carcinogenicity/toxicity studies - On test metabolism (*in vitro*) study - Negative in *Salmonella*
1-Naphthylamine 134-32-7	Private Individual 1991	- High production volume - Potential for widespread exposure - Continuing interest in health effects	Nominated for carcinogenicity testing; under review - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Naturally Occurring Chemicals in the Diet	Private Individuals 1996	- Naturally occurring chemicals in the diet have not been a focus of research - Since regulatory agencies are considering a change in the standard protocol from *ad libitum* feeding to dietary restriction, it is important to know what impact that change will have on carcinogenicity sensitivity.	Caffeine (58-08-2): No additional testing - Completed prechronic dosed-water study - Three continuous breeding studies completed - Two teratology studies completed - Negative in *Salmonella* in two independent tests alpha-Chaconine (20562-03-2): Defer testing pending results of alpha-solanin testing Chlorogenic acid (327-97-9): No testing - Negative in *Salmonella* *p*-Coumaric Acid (7400-08-0): No testing Epicatechin (490-46-0): In review Ethyl acetate (141-78-6): No testing - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative in *Salmonella*
Naturally Occurring Chemicals in the Diet (continued)			2-Furancarboxylic acid (88-14-2): No testing trans-2-Hexenal (6728-26-3): No testing [Hydrogen cyanide] Hydrocyanic acid (74-90-8): No testing Ipomeamarone (494-23-5): In review Isoamyl alcohol (123-51-3): No testing Isobutyl alcohol (78-83-1): No testing - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Naturally Occurring Chemicals in the Diet (continued)			Methylamine (74-89-5): In review - Positive in mouse lymphoma - Negative in *Salmonella* 3-Methyl-1,2-benzenediol (488-17-5): No testing Oxalic acid (144-62-7): No testing - Continuous breeding, completed - Negative in *Salmonella* Phenethyl alcohol (60-12-8): No testing - no suspicion for carcinogenesis based on structure and genetic toxicity tests Piperine (7780-20-3): No testing Propyl alcohol (71-23-8): No testing - Teratology completed
Naturally Occurring Chemicals in the Diet (continued)			Pyrogallol (87-66-1): Selected for carcinogenicity/toxicity studies - Toxicokinetic study on test - Immunotoxicity study on test - Negative in micronucleus assay - Positive in *Salmonella* alpha-Solanine (20562-02-1): Selected for carcinogenicity/toxicity studies - Teratology study on test - Teratology pilot on test Theobromine (83-67-0): In review - Continuous breeding completed - Negative in *Salmonella* Trigonelline (535-83-1): Withdrawn - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Nickel Salts (Soluble And Insoluble)	Department of Health Services, Health and Welfare Agency, State of California 1990	- Need for studies to ascertain the carcinogenic potential of nickel compounds by the oral route - Need dose-response data for low dose extrapolation to establish health-based exposure criteria for humans environmentally exposed to nickel	- NTP toxicology studies of nickel and several nickel compounds (soluble and insoluble) already in progress Nickel sulfate hexahydrate (10101-97-0): - Subchronic inhalation completed - Inhalation carcinogenicity technical report published (TR-454 reports NE- MR, FR, MM, FM): - Positive in mouse lymphoma - Negative in *Salmonella* Nickel subsulfide (12035-72-2): - Subchronic inhalation completed - Inhalation carcinogenicity technical report published (TR-453 reports CE- MR, FR; NE- MM, FM) - Negative micronucleus male/female - Inconclusive in *Salmonella* Nickel (II) oxide (1313-99-1): - Subchronic inhalation completed - Inhalation carcinogenicity technical report published (TR-451 reports SE- MR, FR; EE- FM; NE- MM) - Negative micronucleus male/female - Negative in *Salmonella*
Nitrapyrin 1929-82-4	NIEHS 1999	- High production volume - Potentially high human exposure.	Not being considered for testing at this time - Positive in *Salmonella*
5-Nitroindazole 5401-94-5	NCI 1994	- Need to understand the chronic health effects related to exposure to photographic chemical mixtures.	No testing; lack of evidence of significant human exposure.
4-(N-Nitroso-N-Methylamino)-1-(3-Pyridyl)-1-Butanone 64091-91-4	UAW 1994	See Tobacco-specific N-nitrosamines	See Tobacco-specific N-nitrosamines
Non-Ionizing Surfactants	UAW 1994 Private Individual 1998	See Machining Fluid Constituents	See Machining Fluid Constituents
Nonylphenol 104-40-5	NIEHS 1996	See Endocrine Disrupter Project	See Endocrine Disrupter Project

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Octachloronaphthalenes	NCI 1996	Octachloronaphthalene (OCN) is nominated for an estrogenic activity screen and induction of p450 studies. - Potential for bioaccumulation - Widespread exposure - Inadvertent formation from incineration of products containing OCN.	Octachloronaphthalene (2234-13-1) - Withdrawal pending response from NCI recommendation to replace octachloronaphthalene with PCN 66 and 67 1,2,3,4,6,7-Hexachloronaphthalene (PCN 66) - Selected for testing 1,2,3,5,6,7-Hexachloronaphthalene (PCN 67) - Selected for testing
1-Octene 111-66-0	NIEHS 1995	- High production volume - Potential for worker exposure - Lack of adequate toxicity and carcinogenicity data	No testing - Negative in *Salmonella*
Omeprazole 73590-58-6	Private Individual 1991	- Widespread exposure; used as an anti-ulcer drug. - Investigate the genotoxic and/or cell proliferative effects	Not being considered at this time
Organic Particulate	UAW 1994 2000	The UAW is concerned about chemicals and combinations of chemicals (including particulates) found in the industrial environment in substantial levels. The UAW nominations are intended to assist in evaluating hazards and setting standards for inhalation exposure.	NIOSH assistance requested in evaluating nomination from the standpoint of occupational exposure. Wood dust Flour dust
Organic Solvents	UAW 1994 2000	The UAW is concerned about chemicals and combinations of chemicals (including particulates) found in the industrial environment in substantial levels. The UAW nominations are intended to assist in evaluating hazards and setting standards for inhalation exposure.	Trichloroethylene (79-01-6): In review - Three gavage technical reports published (TR-002 reports CE- MR, MM, FM; NE- MR; TR-243 reports CE MM, FM; IS- MR, NE FR, ; TR-273 reports IS- MR, FR) - Dosed feed and gavage repeated dose and gavage prechronic studies completed - Chemical disposition completed - 4 Immunotoxicity, completed - Immunotoxicity report in preparation - 2 Continuous breeding completed - Negative for chromosome aberrations - Negative for chromosomal aberrations and positive for sister chromosome exchanges in Chinese hamster ovary cells - Inconclusive for sex-linked recessive lethal mutations in *Drosophila*; - Positive in 2 independent mouse lymphoma - Negative in micronucleus assay - Negative in *Salmonella* in two independent tests - Negative for sister chromatid exchanges (nonstandard protocol)

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Organic Solvents (continued)			1,1,1-Trichloroethane (Methyl chloroform) (71-55-6): No testing. EPA has required reduced production with a complete phase-out of manufacturing by Jan. 1996 due to the depletion of the ozone layer. - Subchronic gavage studies completed - Subchronic microcapsules in feed study completed (Tox 41) - Gavage technical report published (TR-003 reports IS- MR, FR, MM, FM) - Microencapsulation in feed toxicity report in preparation - Chemical disposition completed - Mechanisms completed - 2 Teratology completed - Positive for chromosomal aberrations and inconclusive for sister chromatid exchanges in Chinese hamster ovary cells - Negative in mouse lymphoma; inconclusive in mouse lymphoma in another test - Equivocal in male and negative in female micronucleus assay - Negative in *Salmonella* in four independent tests Stoddard solvent (8052-41-3) No testing; CAS 64742-88-7 selected - Negative in *Salmonella* in two independent tests
Organic Solvents (continued)			Stoddard Solvent Type IIC, (64742-88-7): - Report in preparation for carcinogenicity testing - Completed subchronic inhalation testing - Negative in micronucleus M/F Freon 113 (76-13-1): In review
Organotins	NIEHS and U.S. EPA 2000	- High priority for health research needs - Lack of toxicity and mechanistic data on the organotins occurring in drinking water	Selected for long-term single chemical and binary mixture drinking water studies to address pharmacokinetics, neurotoxicity, immunotoxicity, and reproductive and developmental toxicity. Di-N-Butyltin Dichloride (683-18-1) Dimethyltin Dichloride (753-73-1) Monobutyltin Trichloride (1118-46-3) Trichloromethylstannane (993-16-8)
Orthanilic acid 88-21-1	NIEHS 1997	- Limited toxicological information available	No testing; low production and exposure - Negative in micronucleus assay - Weakly positive in *Salmonella*
Oxalic acid 144-62-7	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet.	See Naturally Occurring Chemicals in the Diet.
10,10'-Oxydiphenoxarsine 58-36-6	Private Individual 1996	- Investigate the relationship between the chemical's structure and its potential carcinogenicity.	Nominated for carcinogenicity testing; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Paint Dust	UAW 1994	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions
Paint Mist Solids	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions
Parathion 56-38-2	Private Individual 1994 NIEHS 1994	See Pesticides and Kids	See Pesticides and Kids
PCB 126 57465-28-8	NIEHS/ U.S. EPA 1995	See Dioxin Toxic Equivalence Factor Studies	See Dioxin Toxic Equivalence Factor Studies
2,2',4,4',5-Pentabromodiphenyl ether 60348-60-9	Private Individual 1998	- Bioaccumulative properties and the possibility for widespread human exposure - Lack of subchronic and chronic toxicity information and a suspicion of neuro-developmental toxicity.	In review
Pentabromoethane 75-95-6	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
Pentachlorodibenzofuran 57117-31-4	NIEHS/ U.S. EPA 1995	See Dioxin Toxic Equivalence Factor Studies	See Dioxin Toxic Equivalence Factor Studies
Pentachlorodibenzo-*p*-dioxin 40321-76-4	NIEHS/ U.S. EPA 1995	See Dioxin Toxic Equivalence Factor Studies	See Dioxin Toxic Equivalence Factor Studies
Pentachloroethane 76-01-7	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
N-Pentanal (Valeraldehyde) 110-62-3	NCI 1997	- High production volume (25-100 million lbs) - Potential for widespread consumer and worker exposure - Suspicion of carcinogenicity based on short-term test results and aldehyde structure - Lack of chronic toxicity data.	In review - Negative in *Salmonella*
Perchloromethyl mercaptan 594-42-3	NIEHS 1988	- High production volume - Worker exposure - Lack of chronic toxicity data - Structural interest	No testing; refer to ITC - Positive in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Perfluorinated Compounds	Private Individual 1990	- Determine carcinogenicity potential - Perfluorinated compounds are potent peroxisome proliferators and were found to induce 8-hydroxydeoxyguanosine in the livers of treated rats	- Nominated for carcinogenicity studies; under review. Perfluorodecanoic acid (335-76-2): - 2 Mechanisms completed - Developmental toxicity completed - Conventional teratology completed Perfluorooctanoic Acid (335-67-1): - Cell proliferation completed NTP has performed prechronic studies on the following peroxisome proliferators: Dibutyl Phthalate (Peroxisome Project) (84-74-2) Gemfibrozil (Peroxisome Project) (25812-30-0) 2,4- Dichlorophenoxyacetic Acid (Peroxisome Project) (94-75-7) WY-14643 (Peroxisome Project) (50892-23-4)
Perfluorodecanoic acid 335-76-2	Private Individual 1990	See Perfluorinated Compounds	See Perfluorinated Compounds
Perfluorooctanoic acid 335-67-1	Private Individual 1990	See Perfluorinated Compounds	See Perfluorinated Compounds
Pesticides	Private Individual 1994	Investigate the relationship between pesticides and breast cancer, the link between pesticides and lowered sperm counts, and the feminization of bird/fish/mammal species.	No additional testing. As a consequence of the testing that has already been performed, or is ongoing on these pesticides, and the authority of the EPA to require testing by the registrants, it is unlikely that the NTP will be performing any additional carcinogenicity testing on these pesticides. Dichlorodiphenyltrichloroethane (DDT) (50-29-3): - Dosed-feed carcinogenicity technical report published (TR-131 reports NE- MR, FR, MM, FM) - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative in mouse lymphoma - Negative in *Salmonella* Malathion (121-75-5): - Two carcinogenicity dose-feed technical reports published (TR-24 and TR-192 report NE- MR, FR, MM, FM) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Inconclusive in mouse lymphoma - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Pesticides (continued)			Parathion (56-38-2): - Dosed feed carcinogenicity technical report published (TR-70 reports EE- MR, FR; NE- MM, FM) - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Weakly positive in *Salmonella* in one test and negative in another
	Private Individual 2000	-Widespread use and misapplication. - Chlordane, although banned, persists in the environment and in homes that were sprayed with it. - More recent applications of Dursban and diazinon in these same homes has created a complex mixture of poisons. - New information regarding the action of endocrine disruptors makes this group of poisons appropriate chemicals for study.	Chlordane (12789-03-6) - Received - Positive in mouse lymphoma - Positive in *Salmonella* Dursban (2921-88-2) - Received - Toxicokinetic completed - Immunotoxicity completed - Juvenile pesticide assessment completed - Negative in *Salmonella* Diazinon (333-41-5) - Received - Carcinogenicity dosed-feed technical report published (TR-137 reports NE- MR, FR, MM, FM) - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Negative in *Salmonella* in two independent tests
Pesticides and Herbicides	University of Cincinnati 1994	- Potential carcinogenic effects of pesticides and herbicides. - Circumstantial evidence puts new suspicion on these chemicals.	No testing. These chemicals are regulated by the EPA There have been extensive rodent carcinogenesis and *in vivo* mutagenicity studies performed. Dichlorodiphenyltrichloroethane (DDT) (50-29-3): No testing - Carcinogenicity dosed-feed technical report published (TR-131 reports NE- MR, FR, MM, FM) - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative in mouse lymphoma - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Pesticides and Herbicides (continued)			p,p′-Dichlorodiphenoldichloroethylene (72-55-9): No testing - Carcinogenicity dosed-feed technical report published (TR-131 reports CE- MM, FM; NE- MR, FR) - Negative for chromosomal aberrations and weakly positive for sister chromatid exchanges in Chinese hamster ovary cells - Positive for sex-linked recessive lethal and negative for reciprocal translocation in *Drosophila* - Positive in mouse lymphoma - Negative in *Salmonella* in two independent tests Lindane (58-89-9): No testing - Carcinogenicity dosed-feed technical report published (TR-14 reports NE- MR, FR, MM, FM) - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Inconclusive in mouse lymphoma - Negative in *Salmonella*
Pesticides and Kids	NIEHS 1994	- Little is known about the long-term effects of perinatal exposure to pesticides.	Trichlorfon (52-68-6): - Prechronic dosed-feed completed - Neurotoxicity assessment completed - Total reproductive capacity, completed - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Negative in micronucleus assay - Weakly positive in *Salmonella* Parathion (56-38-2): No testing - Carcinogenicity dosed-feed technical report published (TR-70 reports EE- MR, FR; NE- MM, FM) - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative in *Salmonella* and weakly positive in another independent test Kid Pest Project (Carbaryl) (63-25-2): - Juvenile pesticide assessment completed

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Pesticides and Kids (continued)			Atrazine (1912-24-9): - Four immunotoxicity completed - Negative in *Salmonella* Chlorpyrifos (Dursban) (2921-88-2): - Toxicokinetics completed - Immunotoxicity completed - Juvenile pesticide assessment, completed - Negative in *Salmonella* Kid pest project (Methoxychlor) (72-43-5): - Juvenile pesticide assessment, completed
Petroleum Sulfonates 61789-85-3	UAW 1994 Private Individual 1998	See Machining Fluid Constituents	See Machining Fluid Constituents
Phenethyl alcohol 60-12-8	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Phenol 108-95-2	Private Individual 1991	- High production volume with potential of widespread exposure	Limited resources will not permit further testing of this compound. - Carcinogenicity dosed water technical report published (TR-203 reports NE- MR, FR, MM, FM) - Two teratology completed - Total reproductive capacity completed - Positive in Mouse Lymphoma - Positive in Micronucleus assay - Negative in *Salmonella* in two independent tests - Negative for sex-linked recessive lethal mutations in *Drosophila* - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive for sister chromatid exchanges in one study and negative in another - Positive for chromosomal aberrations in two independent studies
Phenol-Formaldehyde Resin Dust 9003-35-4	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions In review
Phenothiazine 92-84-2	NIEHS 1997	- High production volume - Limited toxicological information	Withdrawn - Negative in Micronucleus assay - Negative in *Salmonella* in two independent tests
3-(Phenylamino)alanine 145545-23-9	Private Individual: 1997	- Use of the dietary supplement L-tryptophan may be related to the development of illnesses such as eosinophilia-myalgia syndrome (EMS).	Nominated for carcinogenicity testing; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
4-Phenylcyclohexene 4994-16-5	Private Individual 1990	- Byproduct formed during the manufacture of latex carpet backings - Chemical is suspected of off gassing after carpet installation and may cause the "sick building syndrome"	Nominated for prechronic and developmental studies; under review
Phenylglyoxal 1074-12-0	NCI 1995	- Potential for exposure associated with use as a reagent. - Shown to be mutagenic - Member of the ketoaldehydes chemical class, which has not been adequately tested for carcinogenicity.	Testing deferred pending receipt of additional information. - Positive in *Salmonella*
Phosphine 7803-51-2	NCI 1989 NCI 1992	- High production volume - High worker exposure - Predicted sharp increase in its use as a grain fumigant. - Increased risk of workers developing non-Hodgkin's lymphoma	No additional testing; phosphine is unstable and decomposes readily - Prechronic (2-week) studies completed - Negative micronucleus (non-standard protocol)
Photographic Fixers and Developers	Private Individual 1991	- Determine health effects of group of chemicals to which workers in photographic and radiologic industries are exposed.	Glutaraldehyde (111-30-8): - Prechronic inhalation toxicity report published (TOX-25) - Carcinogenicity inhalation technical report published (TR-490 reports NE- MR, FR, MM, FM) - Positive for chromosomal aberrations - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Weakly positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* in two tests - Positive in mouse lymphoma - Equivocal in micronucleus assay - Negative in two other micronucleus assays - Inconclusive, weakly positive and positive in *Salmonella* in three independent tests Hydroquinone (123-31-9): - No additional testing - Gavage carcinogenicity technical report published (TR-366 reports SE- MR, FR, FM; NE- MM) - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Inconclusive for sex-linked recessive lethal mutations in *Drosophila* - Positive in mouse lymphoma - Positive in micronucleus assay - Negative in *Salmonella* Silver nitrate (7761-88-8): - No additional testing - Neurotoxicology assessment completed

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Photographic Fixers and Developers (continued)			Diethylene glycol (111-46-6): - Chemical disposition completed - Continuous breeding completed - Short-term in vivo reproductive toxicology completed - Teratology completed - Negative in *Salmonella* Acetic acid (64-19-7): - Negative in *Salmonella* Potassium hydroxide (1310-58-3): - No testing Sodium acetate (127-09-3): - No testing Sodium borate (1303-96-4): - No testing Ammonium sulfate (10043-01-3): - No testing Aluminum sulfate (7783-20-2): - No testing
3-Picoline 108-99-6	NIEHS 1999	- High U.S. production volume - Potential for human exposure - Inadequate toxicity information.	Selected for subchronic toxicity and carcinogenicity testing - Negative in *Salmonella* in two independent tests
Pilocarpine 92-13-7	FDA 1999	- Potential orphan drug The FDA is requesting that studies be conducted using p53 and TG.AC transgenic mice to validate alternative test models for regulatory use and to add to the p53 and TG.AC database.	Nomination temporarily withdrawn by nominator.
Piperine 7780-20-3	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Polybrominated Diphenyl Ethers	State of California EPA and Private Individual 1998 1999 2000	- Bioaccumulate in animal and human tissues - Disrupt thyroid hormone balance - Appear to be neurodevelopmental toxicants	Nominated for carcinogenicity and neurodevelopmental toxicity; under review Pentabromodiphenyl ether (technical) (32534-81-9) - Negative in *Salmonella* Octabromodiphenyl ether (technical) (32536-52-0) 2,2',4,4'-Tetrabromodiphenyl ether (5436-43-1) 2,2',4,4',5-Pentabromodiphenyl ether (60348-60-9) 2,2',4,4',5,5'-Hexabromodiphenyl ether (68631-49-2)
Polybrominated Diphenyl Ethers (Mixture)	Private Individual 1998	- PBDE levels have been exponentially increasing in Sweden - Potential for bioaccumulation	Nominated for carcinogenicity testing; under review

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Polyester-Polystyrene Dust [In Combination With Fibrous Glass]	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions
Potassium hydroxide 1310-58-3	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
Potassium Ferricyanide 13746-66-2	NCI 2000	- Potential for widespread exposure of workers and consumers.	Selected for genotoxicity and subchronic toxicity testing.
Powdered Root of Goldenseal	NIEHS 1998	- Potential for human exposure associated with use as a dietary supplement - Lack of chronic or carcinogenicity data.	Selected for carcinogenicity and reproductive and developmental toxicity. - Dosed-feed repeated dose study on test - Two teratology study completed; report in review - Teratology pilot study completed; report in review
Power-Line Frequency Electric And Magnetic Fields	Electric Power Research Institute 1989	- Recent epidemiological studies weakly support an association between exposure to magnetic fields and the incidence of cancer in both residential and occupational environments. - Data from carcinogenicity studies needed to resolve public health concerns about the possible effects of electric and magnetic fields on human health	- Prechronic toxicity study via whole body exposure published (TOX-58) - Carcinogenicity study via whole body exposure published (TR-488) - Continuous breeding completed - Conventional teratology completed
Prednisone 53-03-2	NCI 1991	- Significant human exposure; commonly prescribed anti-inflammatory - Lack of adequate carcinogenesis data.	No testing When used as an anti-inflammatory agent, exposure period is short and administered doses are low. - Positive in *Salmonella* in two independent tests
Premarin 12126-59-9	Private Individual 1991	- Epidemiological evidence for carcinogenicity inconclusive - Widespread use by post-menopausal women	No testing
Prilocaine 721-50-6	Private Individual 1994	See Local anesthetic compounds	See Local anesthetic compounds
Procaine 59-46-1	Private Individual 1994	See Local anesthetic compounds	See Local anesthetic compounds
Propargyl alcohol 107-19-7	NCI 1996	- High production volume - Potential for human exposure - Suspicion of carcinogenicity - Chronic toxicity data is lacking.	Selected for toxicity and carcinogenicity testing - Two year inhalation study assigned - Subchronic inhalation studies completed - Chemical disposition completed - Positive in *Salmonella*
Propoxycaine 550-83-4	Private Individual 1994	See Local anesthetic compounds	See Local anesthetic compounds
Propyl alcohol 71-23-8	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Propylene glycol dinitrate 6423-43-4	Private Individual 1991	- Past and current human exposure - Potential for human health risks - Suspect agent for neurotoxicity observed in employees of an incineration plant	Deferred pending EPA testing
Propylene glycol mono *tert*-butyl ether 57018-52-7	CPSC 1988	- Potential for increased use - Potential substitute for some ethylene glycol based ethers, which are known teratogens - Potential for widespread exposure at high levels - Lack of adequate toxicity data	- Subchronic inhalation completed - Inhalation carcinogenicity on test - Chemical disposition completed - Negative for CA and SCE in CHO cells - Negative male and weakly positive female micronucleus assay - Positive in *Salmonella*
Pulegone 89-82-7	NIEHS 1998	- Potential for human exposure - Lack of carcinogenicity data	Selected for toxicity and carcinogenicity testing - Repeated dose gavage study assigned - Chemical disposition on test - Negative in *Salmonella*
Pyridostigmine bromide 101-26-8	NCI 1995	- Concern about possible link to the unexplained illness of Gulf War veterans.	No testing Carcinogenicity testing of pyridostigmine bromide alone is not warranted but should be performed in combination studies with other Gulf War chemicals. - Negative in *Salmonella*
Pyrogallol 87-66-1	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Resveratrol 501-36-0	NIEHS 2001	- Marketed in pure or extract form as a dietary supplement - Numerous reported beneficial effects but toxicity is poorly characterized.	Nominated for toxicity testing; under review
All-trans-retinyl palmitate 79-81-2	FDA 2001	- Increasing widespread use of this compound in cosmetic retail products for use on sun-exposed skin - Need to investigate the biochemical and histological cutaneous alterations elicited by retinyl palmitate and the association between topical application of retinoids and enhancement of photocarcinogenesis.	Nominated for phototoxicity and photocarcinogenicity testing; under review
Retroviral Vectors	NIEHS 1991	- To study the long-term effects of experimental treatment of immune deficiency disorders	- Two intraperitoneal injection repeated dose completed - Whole body exposure repeated dose completed - Intravenous injection repeated dose completed
Rosin 8050-09-7	NCI 1989	- High production volume - Used in a variety of consumer products - Potential for significant human exposure - Carcinogenic potential is unknown	Nominated for tumor promotion studies; not under consideration at this time.

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Saw Palmetto	Private Individual 1997	- Increasing use of herbal dietary supplement being promoted as a prostate hypertrophy preventative agent, and as a therapy for this condition. - Some clinical data show beneficial effects greater than those from prescription medications, with very good tolerance. - Lack of long-term and carcinogenicity testing data	No testing; low potential for reproductive toxicity. Saw Palmetto Extract (84604-15-9) beta-Sitosterol (83-46-5) - Negative in micronucleus assay - Negative in *Salmonella*
Senna (Powdered) 8013-11-4	FDA 1999	- The safety of laxatives is currently being reassessed by the FDA as a result of the testing of phenolphthalein for carcinogenicity in rodents. Senna has been reported as positive in the Ames test, and a preliminary 2-year rat study showed an increase in lymph node hyperplasia.	Selected for carcinogenicity testing - Positive in *Salmonella*
Sesamol 533-31-3	NCI 1989	- Potential for human exposure to sesamol as a common constituent of sesame oil - Lack of adequate toxicity data	No testing; no commercial production or use
Biogenic silica	Private Individual 1988	- Potential for widespread environmental contamination - Respirable size silica fibers identified in smoke from sugar cane burning - Reports of toxic effects associated with sugar cane farming (e.g., mesothelioma, leukemia)	- Deferred pending response from nominator regarding definition of a representative test sample. Will be considered with study of fibers.
Silicones (Class Study)	Private Individual 1994	- Testing performed in the 1960s and 1970s is inadequate - Immunotoxicity needs to be addressed	No testing by NTP at the present time.
Silver nitrate 7761-88-8	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
Simazine 122-34-9	NIEHS 1992	See Acetochlor	- Chronic dosed-feed, on test - Subchronic completed
beta-Sitosterol 83-46-5	Private Individual 1997	See Saw Palmetto	See Saw Palmetto
Sodium acetate 127-09-3	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers
Sodium benzoate 532-32-1	Private Individual 2001	- Widespread use as a food additive - Could be a health hazard if it is carcinogenic.	Not being considered for testing
Sodium borate 1303-96-4	Private Individual 1991	See Photographic Fixers and Developers	See Photographic Fixers and Developers

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Sodium bromate 7789-38-0	U.S. EPA 1997	- Data from toxicity and carcinogenicity studies needed for developing new drinking water regulations for water disinfection by-products. - The EPA requested that the DBPs be evaluated in chronic mouse transgenic studies as well as the standard 2-year cancer bioassay.	Selected for testing under the Water Disinfection Model Evaluation initiative - Toxicokinetics completed - Repeated dose topical study completed - Subchronic dosed-water and topical studies, on test - Continuous breeding report in preparation - Reproductive/Developmental/General Toxicty (28-day) dosed-water (screen) completed - Immunotoxicity completed
Sodium chlorate 7775-09-9	U.S. EPA, Office of Water 1995	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)
Sodium metasilicate 6834-92-0	NIOSH 1998	- Potential for widespread occupational exposure - Biologically active - Existing data gaps	Nominated for subchronic inhalation testing; under review - Immunotoxicity completed
Sodium molybdate 12680-49-8	NCI 1999	See Ammonium molybdate	See Ammonium molybdate
Sodium thioglycolate 367-51-1	NCI 1996	- Widespread worker and consumer exposure. - Since it is used in cosmetic products, permanent wave and hair straightening products, exposure is mainly to the female population.	In review - Repeated dose topical study completed - Negative in *Salmonella* - Teratology completed - Teratology report in review - Two teratology pilot studies completed
alpha-Solanine 20562-02-1	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet
Spirits (Alcoholic Beverages)	Private Individual 1992	- Lack of studies on alcoholic beverages - Widespread consumer exposure	No testing; NTP currently testing ethanol and urethane
Stoddard Solvent 8052-41-3	UAW 1994	See Organic Solvents	See Organic Solvents
Stoddard Solvent (Type IIC) 64742-88-7	UAW 1994	See Organic Solvents	See Organic Solvents
Styrene 100-42-5	Private Individual 1991	None given by nominator	No further testing at this time; industry is performing chronic studies - Carcinogenicity gavage technical report published (TR-185 reports EE- MM; NE- MR, FR, FM) - Prechronic inhalation completed - Mechanisms completed - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative in *Salmonella* in two independent tests

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Styrene oxide 96-09-3	State of California EPA (OEHHA) 1995	- Lack of acute exposure data.	No further testing - Carcinogenicity study by gavage reported in literature - Two teratology studies completed - Positive in mouse lymphoma - Positive in *Salmonella*
Sulfuric Acid Mist	UAW 1994 1999	The nominator is concerned about chemicals and combinations of chemicals found in the industrial environment in substantial levels.	Sulfuric acid (7664-93-9): No testing; IARC has determined that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans (Group 1).
Symphytine 22571-95-5	NIEHS 1998	- Potential for chronic human exposure - Limited carcinogenicity data	Selected for reproductive and developmental toxicity and carcinogenicity testing.
Synthetic Fragrances	Private Individual 1996	- Increasing complaints that synthetic fragrances are having an adverse effect on health - Many people have developed sensitivities to chemicals used in fragrances.	In review. NTP has requested information from the Consumer Product Safety Commission (CPSC) on adverse health effects and testing strategies for fragrances or for substances that create symptoms described by fragrance-sensitive people. 1,8-Cineol (470-82-6): - Prechronic dosed-feed completed - Prechronic gavage completed - Negative for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Negative in *Salmonella*
Synthetic Mineral Fibers	UAW 1994 1998 2000	The nominator is concerned about chemicals and combinations of chemicals found in the industrial environment in substantial levels.	Carbon/graphite fiber composites -Under review -Consider as part of NIOSH/NIEHS toxicity evaluation of complex industrial exposures
Synthetic Polymer Process Emissions	UAW 1994 1999	The nominator is concerned about chemicals and combinations of chemicals found in the industrial environment in substantial levels.	Methyl ethyl ketone peroxide (1338-23-4): No additional testing - Topical toxicity technical report published (TOX-18) - Positive for chromosomal aberration and sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Negative in micronucleus assay - Negative in *Salmonella* and positive in another *Salmonella* test Formaldehyde (50-00-0): - Prechronic inhalation completed - Teratology completed - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive for chromosomal aberrations and weakly positive for sister chromatid exchanges in Chinese hamster ovary cells

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Synthetic Polymer Process Emissions (continued)			- Positive for sex-linked recessive lethal mutations and negative for reciprocal translocation in *Drosophila* in two independent tests - Positive for sex-linked recessive lethal mutations and reciprocal translocation in *Drosophila* in two independent tests - Negative for sex-linked recessive lethal reciprocal translocation in *Drosophila* - Positive in *Salmonella* in seven independent tests; weakly positive in *Salmonella* in two tests. 1,6-Hexanediamine dihydrochloride (6055-52-3): - Inhalation and dosed-water subchronic toxicity report (TOX-24) - Negative in micronucleus assay (male and female) Triethylamine (121-44-8): Selected - Negative in *Salmonella*
Synthetic Polymer Process Emissions (continued)			Phenol-formaldehyde resin dust (9003-35-4) In review di-2-Ethylhexanol (68915-36-6) In review Thermoplastic pyrolysis products (thermoplastic) In review Epoxy-polyurethane catalysts In review Paint dust: No testing planned because of the diverse nature of this category of substance, and because any sample selected for testing would be representative of only a limited class of potential samples. Polyester-polystyrene dust [in combination with fibrous glass]: In review
Synthetic Polymer Process Emissions (continued)			Paint mist solids: No testing planned because of the diverse nature of this category of substance, and because any sample selected for testing would be representative of only a limited class of potential samples Dimethylethylamine (598-56-1) In review
Talc 14807-96-6	UAW 1994 Private Individual 1998	See Mineral Particulate	See Mineral Particulate

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Tamoxifen	Private Individual 1992	- May induce or promote the development of aggressive hormone independent tumor - Teratogen on the developing human genital tract.	Tamoxifen citrate (54965-24-1) - Chemical disposition completed - Toxicokinetics completed - Continuous breeding completed
TCDD 1746-01-6	NIEHS/ U.S. EPA 1995	See Dioxin Toxic Equivalence Factor Studies	See Dioxin Toxic Equivalence Factor Studies
2,2'4,4'-Tetrabromodiphenyl ether 5436-43-1	Private Individual 1998	See Polybrominated Diphenyl Ethers	See Polybrominated Diphenyl Ethers
1,1,1,2-Tetrabromoethane 630-16-0	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
1,1,2,2-Tetrabromoethane 79-27-6	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
Tetrabromophthalic anhydride 632-79-1	NIEHS 1995	See Brominated chemicals	See Brominated chemicals
3,3′,4,4′-Tetrachloroazoxybenzene (TCAB) (21232-47-3) and 3,3′,4,4′-Tetrachloroazobenzene (TCAOB) (14047-09-7) In Drinking Water	U.S. EPA 1988 U.S. EPA 1991	- Potential for worker and consumer exposure - Contaminants of several herbicides derived from dichlorophenol - Potential for persistence and accumulation on food crops - Potential for contamination of drinking water	TCAB: - Selected for gavage carcinogenicity/toxicity study - Gavage prechronic toxicity report (TOX-65) - Chemical disposition completed - Metabolism completed - Continuous breeding on test - Positive in *Salmonella* and negative in another independent test - Positive male/female micronucleus and negative in another independent test TCAOB: - Gavage prechronic toxicity report (TOX-66) - Chemical disposition completed - Two metabolism completed - Positive male/female micronucleus and negative in another independent test - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin 1746-01-6	Private Individual 1991	- Evidence that ovarian hormones, probably estrogens, are required for hepatocarcinogenic actions of TCDD - Excellent candidate to study the relationship between cell proliferation and cancer	Consider with studies of Dioxin Toxic Equivalence Factor studies. - Carcinogenicity gavage technical report published (TR-209 reports CE- MR, FR, MM, FM) - Carcinogenicity topical technical report published (TR-201 reports CE- FM; EE- MM) - Cell proliferation completed - Four chemical disposition studies completed - Four mechanisms completed - Toxicokinetics on test - Immunotoxicity completed - Three teratology pilot studies completed - Negative for chromosome aberrations - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative in mouse lymphoma - Negative in *Salmonella* - Negative for sister chromatid exchanges
1,1,1,2-Tetrachloroethane 630-20-6	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
1,1,2,2-Tetrachloroethane 79-34-5	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
2,3,5,6-Tetrachloropyridine 2402-79-1	NIEHS 1997	- High production volume - Inadequate or no toxicity studies	Nominated for carcinogenicity; under review
Tetralin/Decalin	NCI 1993	- High potential for consumer exposure through their use as solvents in paints, waxes, and polishes - Potential for contamination of drinking water supplies	Decalin (91-17-8) - Carcinogenicity inhalation technical report draft (TR-513) - Short-term *in vivo* teratology completed - Weakly positive male and negative female micronucleus assay - Negative in *Salmonella* Tetralin (119-64-2) - Inhalation prechronic completed - Subchronic toxicity review - Chronic inhalation assigned - Negative in micronucleus assay (M/F) - Negative in *Salmonella*
Theobromine 83-67-0	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Thermoplastic Pyrolysis Products	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions
Thimerosal 54-64-8	FDA 2001	- Neurodevelopmental, immunologic, and reproductive toxicity of data are lacking.	Nominated for developmental and reproductive toxicity and immunotoxicity testing; under review - *In vitro* cytogenetics on test - Negative in *Salmonella*
Tobacco-Specific N-Nitrosamines	American Health Foundation 1994	- The first TSNA to be studied should be NNK, which induces lung tumors independent of route or site of application. - Suspected of inducing lung tumors not only seen in active smokers, but also in passive smokers	4-(*N*-Nitroso-*N*-methylamino)-1-(3-pyridyl)-1-butanone (64091-91-4): Nominated for carcinogenicity testing; under review - Two special studies completed - Negative in micronucleus assay
Topoisomerase II Inhibitors	Private Individual 1995	- Potent carcinogens causing cancers with characteristic cytogenetic modifications and short latent periods - Extensive study needed	No specific agents identified by nominator In review
Toxaphene Isomers	Private Individual 2000	- Although now banned in the U.S., they were once used as pesticides and have a high potential for bioaccumulation across the food chain.	No further consideration at this time
Tremolite (Non-Asbestiform)	CPSC 1988	- Used in play sand - Potential for human exposure, especially children - Congressional and public interest in the safety of play sand - Lack of adequate chronic toxicity data	Selected for carcinogenicity testing. No testing based on inability to obtain representative test material
Triamcinolones Class Study	NCI	- Extensive use in pharmaceuticals over an extended period of time - Significant human exposure - Lack of adequate carcinogenicity data	Nominated for carcinogenicity. NCI recommended triamcinolone acetonide (76-25-5) as the most suitable chemical to test in order to obtain information on the carcinogenicity potential of triamcinolone and its derivatives.
1,3,5-Triazine-1,3,5(2h,4h,6h)-Triethanol 4719-04-4	NCI 1999	- An industrial biocide with very high production volume and worker exposure potential - Inadequate testing - Possibility of the release of formaldehyde from TZT-like biocides	Deferred pending receipt of additional information - Weakly positive in *Salmonella*
Tribromophenol 118-79-6	NIEHS 1995	See Brominated chemicals	See Brominated chemicals
Tribromosalan 87-10-5	NIEHS 1995	See Brominated chemicals	See Brominated chemicals
Tributyltin Chloride 1461-22-9	NIEHS 1999	- Identified as a representative organotin for testing consideration	Not being considered at this time

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Trichlorfon 52-68-6	NIEHS 1994	See Pesticides and Kids	See Pesticides and Kids
1,1,1-Trichloro-2,2,2-trifluoroethane 354-58-5	NIEHS 1991	See Halogenated Ethanes Class Study	See Halogenated Ethanes Class Study
Trichloroacetic acid 76-03-9	U.S. EPA 1988 U.S. EPA, Office of Water 1995	- Water disinfection by-product - High human exposure - Suspicion of carcinogenicity See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)	No testing; other water disinfection byproducts selected for study See Water Disinfection By-Products - Halogenated Acetic Acids (HAAs)
1,1,1-Trichloroethane 71-55-6	NIEHS 1991 UAW 1994 Private Individual 1998	See Halogenated Ethanes Class Study See Organic Solvents	See Halogenated Ethanes Class Study See Organic Solvents
Trichloroethylene 79-01-6	UAW 1994 Private Individual 1998	See Organic Solvents	See Organic Solvents
2,4,5-Trichlorophenoxyacetic acid 93-76-5	Private Individual 1992	- Widespread human exposure based on past use as herbicide - Evidence of association between exposure and non-Hodgkin's lymphoma	Nominated for carcinogenicity testing; under review - Immunotoxicity completed - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Negative for sex-linked recessive lethal mutations in *Drosophila* - Negative in *Salmonella* in two independent tests
Triethanolamine	UAW 1994 Private Individual 1998	See Machining Fluid Constituents	See Machining Fluid Constituents
Triethylamine 121-44-8	UAW 1994 Private Individual 1998	See Synthetic Polymer Process Emissions	See Synthetic Polymer Process Emissions
1,3,5-Triglycidyl isocyanurate 2451-62-9	NCI 1993	- Nomination based on current level of use, predicted growth, and indications of potential exposures - Toxicity data available for related compounds show that it may be carcinogenic.	Deferred pending EPA's risk management assessment of the chemical. - Positive for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in *Salmonella*
Trigonelline 535-83-1	Private Individuals 1996	See Naturally Occurring Chemicals in the Diet	See Naturally Occurring Chemicals in the Diet

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Trimethoprim/Sulfamethoxazole (Commercial) 8064-90-2	NCI 1992	- Significant human exposure as extensively used drug for treatment of urinary tract infections and pneumonia caused by *P. carinii* (PCP) and its potential use in AIDS patients with PCP	- Selected for carcinogenicity/toxicity study; testing deferred pending results of industry testing - Positive in micronucleus assay
S-Trioxane 110-88-3	NIEHS 1999	- High production volume and potentially high human exposure..	Nominated for carcinogenicity testing; deferred pending receipt of additional information - Negative in *Salmonella*
Turpentine 8006-64-2	UAW 2000	The nominator is concerned about chemicals and combinations of chemicals found in the industrial environment in substantial levels.	In review
Vinclozolin 50471-44-8	NIEHS 1996	See Endocrine Disrupter Project	See Endocrine Disrupter Project
5-Vinylnorbornene 3048-64-4	NIEHS 1997	- Lack of data on chemical disposition, metabolism, toxicokinetics, reproduction, development, carcinogenicity, and immunotoxicity	No further consideration; low worker exposure
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs)	AWWARF 1991 U.S. EPA, Office of Water 1995	The process of water purification can produce unwanted contaminant by-products. There is widespread exposure to treated drinking water, yet there is limited toxicity study data upon which to base human risk.	Chloral (75-87-6): No further testing recommended - Weakly positive In *Salmonella* Bromochloroacetonitrile (83463-62-1): No testing Dibromoacetonitrile (3252-43-5): - Selected as a water disinfection by-product for carcinogenicity testing - Chemical disposition on test - Reproductive, developmental, and general toxicity completed - Negative for sex-linked recessive lethal mutations in *Drosophila*; - Weakly positive in *Salmonella* in three independent tests and inconclusive in another test - Neurotoxicology assessment selected - Repeated dose and subchronic dosed-water study completed, carcinogenicity on test
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Dichloroacetonitrile (3018-12-0): - Weakly positive for chromosomal aberrations and positive for sister chromatid exchanges in Chinese hamster ovary cells - Positive for sex-linked recessive lethal mutations in *Drosophila* and negative for reciprocal translocation in *Drosophila* - Positive in *Salmonella* Bromodichloroacetic acid (71133-14-7): - Subchronic dosed-water tests completed, carcinogenicity study assigned

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Bromoacetic acid (79-08-3): In review - Positive in *Salmonella* in two independent tests 3-Chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX) (77439-76-0): - Repeated dosed-water study completed - Subchronic and carcinogenicity assigned - Toxicokinetic study completed - Chemical disposition completed Dibromoacetic acid (631-64-1): - Repeated dose and subchronic dosed-water study completed, carcinogenicity on test - Subchronic dosed-water study on test - Neurotoxicology assessment (report in preparation) - Toxicokinetic study completed - Spermiation inhibition study completed - Immunotoxicity study completed - Immunotoxicity study (report in preparation) - Positive in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Bromodichloromethane (75-27-4): - Gavage technical report published (TR-321 reports CE- MR, FR, MM, FM) - Two chemical disposition completed - Toxicokinetic study on test - Reproductive, developmental, and general toxicity completed - Negative for chromosomal aberrations and inconclusive for sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Inconclusive male and negative female micronucleus assay - Negative in two independent micronucleus assays (M/F) - Inconclusive in micronucleus assays (M/F) - Negative male and inconclusive female micronucleus assay - Negative in micronucleus assay - Negative in two independent *Salmonella* Water disinfection byproduct - 28-day and 13-week dosed-water on test - 28-day gavage on test - 21-day dosed-water completed and chronic in histopathology Water disinfection model - 14-day topical completed and 26 wk/9 mo on test - 26 week dosed-water on test - 26 week gavage on test - Carcinogenicity/toxicity (9 mo) dosed-water and gavage studies on test Transgenic Model Evaluation - Gavage and dosed-water 26-week studies completed
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Glyoxal (107-22-2): - Dosed-water subchronic completed - Positive in two independent *Salmonella* Dichloroacetic acid (79-43-6): - Positive in *Salmonella* - Spermiation inhibition completed Water disinfection byproduct - 90-day dosed-water study completed, 2 year study assigned Water disinfection model -14-day topical completed and 26 wk/9 mo on test - 26 week dosed-water on test - Carcinogenicity/toxicity (9 mo) dosed-water study on test - Immunotoxicity study (report in preparation)

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Trichloroacetic acid (76-03-9): No testing; deferred to ascertain whether EPA requires additional toxicity studies. - Negative in *Salmonella* Bromodichloroacetic acid (71133-14-7): - Water Disinfection By-Product 14-day and 90-day dosed-water completed, chronic assigned Bromoacetic acid (79-08-3) In review - Positive in two independent *Salmonella* 3-Chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX) (77439-76-0): - Water Disinfection By-Product 14-day dosed-water completed, 90-day and chronic assigned - Chemical disposition completed - Toxicokinetic completed
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Dibromoacetic acid (631-64-1): - Toxicokinetic study completed - Neurotoxicology assessment report in preparation - Spermiation inhibition completed - Positive in *Salmonella* Water Disinfection By-Product - 28-day dosed-water study on test - 14-day and 90-day dosed water studies completed and 2 year on test - Immunotoxicity completed and report in preparation for another independent test Methyl glyoxal (78-98-8): In review Chlorate (Chlorate Ion) (14866-68-3): No testing Cyanogen chloride (506-77-4): - No further testing - Negative in *Salmonella*
Water Disinfection By-Products-Halogenated Acetic Acids (HAAs) (continued)			Bromochloroacetic acid (5589-96-8): Water disinfection by-products -14-day and 90-day dosed-water studies completed and 2-year assigned - Reproductive, developmental, and general toxicity (28-day) completed - Positive in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
			Sodium chlorate (7775-09-9): Water Disinfection By-Products - 21-day dosed-water completed and 2-year in histopathology - Teratology report in review - Teratology pilot study completed - Negative in micronucleus assay (M/F) - Negative in *Salmonella*
Waxes used on fruits and vegetables	Private Individual 1994	Waxes used on fruits and vegetables should be tested for human toxicity.	No testing; these chemicals are regulated by FDA.
Welding Fume (Copper, Zinc, Lead Oxide)	UAW 1994 Private Individual 1998	See Metals	See Metals
Wireless Communication Devices	FDA 1999	- Use of wireless communication devices like cellular phones is increasing rapidly. - Little is known about the possible health effects of repeated or long-term exposure to low levels of radio frequency radiation (RFR) of the types emitted by such devices. - The data from animal exposure studies are conflicting and most of the research was not conducted with actual cellular phone radiation.	Selected -An interagency program to design studies assessing cancer and non-cancer health effects will be established.
Wood Dust	UAW 1994 Private Individual 1998	See Organic Particulate	See Organic Particulate
Xylenes	State of California EPA (OEHHA) 1995	There are data gaps that should be filled in order to set scientifically based acute and chronic non-cancer reference exposure levels for use in human and environmental risk assessments.	No additional testing by NTP. NTP does not perform human clinical or exposure studies. Lack of funding to conduct a repeat study or to fill data gaps when carcinogenicity and other study data are already available. Xylenes (Mixed) (1330-20-7): - Gavage, technical report published (TR-327 reports NE, MR FR MM FM) - Teratology completed - Negative for chromosomal aberrations and sister chromatid exchanges in Chinese hamster ovary cells - Positive in mouse lymphoma - Negative in *Salmonella*

Chemical Name/ CAS Number	Nomination Source/Year	Rationale for Request	Current NTP Status[1,2]
Xylenes (Continued)			*o*-Xylene (95-47-6): - Negative in *Salmonella* *p*-Xylene (106-42-3): - Negative in *Salmonella* *m*-Xylene (108-38-3): - Negative in *Salmonella*

[1]This table contains updated information through August 2001. For additional information about NTP studies listed in this table contact Central Data Management, Mail Drop E1-02, NIEHS. P.O. Box 12233, Research Triangle Park, NC 27709 (Phone: 919-541-3419; Fax: 919-541-3687; e-mail: CDM@niehs.nih.gov). The abstracts for all published NTP long-term carcinogenicity technical reports and short-term toxicity study reports are available electronically over the Internet. To view all abstracts and additional NTP information, use the URL http://ntp-server.niehs.nih.gov/.
[2]CE = clear evidence of carcinogenic activity; SE = some evidence of carcinogenic activity; EE = equivocal evidence of carcinogenic activity; NE = no evidence of carcinogenic activity; IS = inadequate study of carcinogenic activity; MR = male rats; FR = female rats; MM = male mice; and FM = female mice