2013

Minnesota Chemicals of High Concern Report

Minnesota Department of Health

Toxic Free Kids Program

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About This Report
This report and the 2013 update of the Minnesota Chemicals of High Concern list (CHC) were completed by the Toxic Free Kids (TFK) program. Through the TFK program, the Minnesota Department of Health (MDH) is working to identify and communicate the potential for hazardous chemical exposures which could be harmful to human health, particularly to vulnerable or susceptible populations, such as children and pregnant women. The TFK program is housed in the Health Risk Assessment Unit within the Environmental Health Division at MDH. The TFK program works on updating and reviewing the CHC and Priority Chemical (PC) lists established by Minnesota statute, nominating chemicals for development of health based guidance values within other MDH programs such as the Contaminants of Emerging Concern (CEC) program, and is involved in risk communication efforts. The TFK program supports the MDH mission to protect, maintain, and improve the health of all Minnesotans.

This 2013 TFK program report describes the review and revision of the CHC list since it was first published in 2010. This document lists chemicals added and excluded from the 2013 CHC list and includes web links to the full 2013 CHC list. In addition, this document includes an update on a second list, the PC list. MDH also describes TFK program plans for future actions regarding this Minnesota statute. This document concludes with a brief update on the status of other states with similar chemical legislation which were integral in the original formation of the Minnesota 2010 CHC list.

Minnesota Department of Health

Environmental Health Division--Health Risk Assessment Unit--Toxic Free Kids Program

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Acronyms and Abbreviations

ATSDR	Agency for Toxic Substances and Disease Registry
BCF	Bioconcentration Factor
BBP	Butyl benzyl phthalate
BPA	Bisphenol A
CA EPA	California Environmental Protection Agency
CAL Prop 65	California Proposition 65 (under CA EPA)
CDR	Chemical Data Reporting (under EPA)
CEC	Chemicals of Emerging Concern (under MDH)
ChAMP	Chemical Assessment and Management Program (under EPA)
CHC	Chemicals of High Concern (States of Minnesota and Maine)
CHCC	Chemicals of High Concern for Children (State of Washington)
ChV	Chronic Value
COC	Chemicals of Concern (States of Maine and California)
CSPA	Children's Safe Product Act (under State of Washington)
DBP	Dibutyl phthalate
decaBDE	Decabromodiphenyl ether
DEHP	Di (2-ethylhexyl) phthalate
DfE	Design for the Environment (under EPA)
EC	European Commission
EC_{50}	Effective Concentration 50
EPA	U.S. Environmental Protection Agency
ESIS	European chemical Substances Information System
EU	European Union
HB	House Bill
HBCD	Hexabromocyclododecane
HHS	U.S. Department of Health and Human Services
HPV	High Production Volume
HSDB	Hazardous Substances Data Bank (maintained by NLM)
IARC	International Agency for Research on Cancer (under WHO)
IRIS	Integrated Risk Information System (maintained by EPA)
LC_{50}	Lethal Concentration 50
LOAEC	Lowest Observed Adverse Effect Concentration
LOAEL	Lowest Observed Adverse Effect Level
LOEC	Lowest Observed Effect Concentration
Maine DEP	Maine Department of Environmental Protection
MDH	Minnesota Department of Health
MPCA	Minnesota Pollution Control Agency
NIH	U.S. National Institute of Health
NLM	U.S. National Library of Medicine
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NTP	U.S. National Toxicology Program
OECD	Organisation for Economic Co-operation and Development

Acronyms and Abbreviations Continued

OSPAR	Oslo and Paris Commission
OPPT	Office of Pollution Prevention and Toxics (under EPA)
PC	Priority Chemical (States of Minnesota and Maine)
PBT	Persistent, Bioaccumulative, and Toxic
PBiT	Persistent, Bioaccumulative, and inherently Toxic
REACH	Registration, Evaluation, Authorisation, & Restriction of Chemicals (under EU)
SIDS	Screening Information Data Set
TDCPP	tris(1, 3-dichloro-2-propyl)phosphate
TSCA	Toxic Substances Control Act (under EPA)
vPvB	very Persistent and very Bioaccumulative
WHO	World Health Organization

Executive Summary

The Minnesota Chemicals of High Concern (CHC) list was created by the Minnesota Department of Health (MDH) as a result of state legislation, Minnesota Statutes 116.9401 to 116.9407, which passed in 2009 (Minnesota Statutes 2012). The purpose of the CHC list is to identify chemicals which could be harmful to human or environmental health and specifically chemicals which are suspected carcinogens, reproductive or developmental toxicants, or persistent, bioaccumulative, and toxic or very persistent and very bioaccumulative.

The original CHC list was published in 2010 and contained 1,756 chemicals. From this CHC list a smaller chemical list, called the Priority Chemical (PC) list, was derived which consists of nine chemicals. The chemicals on the PC list meet the CHC requirements and are high production volume (HPV) chemicals (as identified by the U.S. Environmental Protection Agency (EPA)) that have been found, through sampling and analysis, to be in human tissue, the natural environment or the household environment.

Both the CHC list and PC list are dynamic lists and reviews and revisions of the lists are a continuous process. Part of the 2013 CHC list update included rapid evaluation of chemicals on the 2010 CHC list for the data needed to meet the Minnesota requirements for a CHC. The evaluation involved determining whether each chemical would be retained on the 2013 CHC list or flagged for further, in-depth review and possible 2013 CHC list exclusion. In particular, new data and updated models provided more information for evaluating the persistent, bioaccumulative and inherently toxic (PBiT), chemicals listed by Canada. As a result of the rapid evaluation of data and the PBiT chemical review, MDH excluded 57 chemicals from the 2013 CHC list that had been listed in 2010 CHC list (Appendix 1).

An update to the CHC list also included reviewing chemicals that could be added to the list. MDH monitors new toxicity literature as well as authoritative state, national, and international chemical hazard lists for chemicals which meet the Minnesota CHC requirements. Through this process MDH added 32 chemicals to the 2013 CHC list (Appendix 2). As a result of the removals and additions, the CHC list went from 1,756 chemicals in 2010 to 1,731 chemicals in 2013. There are around 260 chemicals on the 2013 CHC list that are flagged for further review in the coming year.

There is no change to the nine chemicals on the PC list. MDH is in the process of reviewing one candidate chemical and one candidate chemical group for potential PC list inclusion. The chemical is tris(1, 3-dichloro-2-propyl)phosphate (TDCPP) and the chemical group is nonylphenol including its ethoxylates (see Appendix 3 for CAS numbers). MDH is working with its state partners to assess the data for these candidate chemicals in a way that ensures consistency in priority chemical listing.

In early 2013 the U.S. Environmental Protection Agency (EPA) released the non-confidential 2012 Chemical Data Reporting (CDR) information which contains data for HPV chemicals (U.S. Environmental Protection Agency, 2013). This is the first update of HPV chemical data since the last reporting cycle in 2006. This most recent cycle of HPV chemical data reporting provides information for 7,674 chemicals which MDH is in the process of reviewing. Review of the latest HPV data could result in one of three outcomes for a CHC's HPV status: 1) no change, 2) added HPV status, or 3) removal of HPV status. The HPV status of a chemical on the CHC list is important because it affects the eligibility of a chemical for PC list consideration. Any changes in status will be reflected in the 2013 published list once MDH completes the HPV chemical review (see web link below).

Moving forward with chemical toxicity assessments, MDH will no longer use the chemical hazard guidelines of EPA's now defunct Chemical Assessment and Management Program (ChAMP) and will instead use EPA's Design for the Environment (DfE) Alternatives Assessment chemical hazard guidelines (U.S. Environmental Protection Agency, 2011). These guidelines provide a basis by which to assess and prioritize chemical hazards. This change is being made because it is more practical to use hazard guidelines of an active program (DfE). MDH chose to use the guidelines of the DfE program because the criteria ranges are agreed upon by other national and international organizations as being appropriate for chemical hazard identification (e.g. United Nation's Globally Harmonized System for the Classification and Labeling of Chemicals). The DfE Alternatives Assessment program contains similar hazard categories as ChAMP, which also allows for a smooth transition.

MDH monitors the status of chemical legislations across the country to understand the similar actions being taken by other states and to gather information on the direction of chemical policies within the United States. MDH closely monitors chemical hazard laws of the states of Maine and Washington because of similar legislation and mandates to that of Minnesota's. Currently the states of California, Oregon and North Carolina are attempting to pass related chemical hazard legislation.

The updated 2013 CHC list and this report are published to the MDH website and can be found here: http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/index.html. Future updates and revisions will also be published to this MDH website. To receive notifications of MDH activity related to this legislation the public can sign up for GovDelivery e-mails at the above web link as well.

Minnesota Chemicals of High Concern Report

Legislative Background

In 2009 state legislation was passed related to concerns about potentially hazardous chemicals being found in consumer products, especially those intended for children. This legislation requires the Minnesota Department of Health (MDH), in consultation with the Minnesota Pollution Control Agency (MPCA), to create and maintain two lists of chemicals. The first list, called the Chemicals of High Concern, is defined in Minnesota Statutes 2012, 116.9401:

> (e) "Chemical of high concern" means a chemical identified on the basis of credible scientific evidence by a state, federal, or international agency as being known or suspected with a high degree of probability to:
> (1) harm the normal development of a fetus or child or cause other developmental toxicity;
> (2) cause cancer, genetic damage, or reproductive harm;
> (3) disrupt the endocrine or hormone system;
> (4) damage the nervous system, immune system, or organs, or cause other systemic toxicity;
> (5) be persistent, bioaccumulative, and toxic; or
> (6) very persistent, and very bioaccumulative.

The statute notes in Minnesota Statutes 2012, 116.9402:

> (c) The department shall consider chemicals listed as a suspected carcinogen, reproductive or developmental toxicant, or as being persistent, bioaccumulative, and toxic, or very persistent and very bioaccumulative by a state, federal, or international agency. These agencies may include but are not limited to, the California Environmental Protection Agency, the Washington Department of Ecology, the United States Department of Health, the United States Environmental Protection Agency, the United Nation's World Health Organization, and European Parliament Annex XIV concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals.
>
> (d) The department may consider chemicals listed by another state as harmful to human health or the environment for possible inclusion in the list of chemicals of high concern.

MDH published the first Chemicals of High Concern list in July of 2010 on the MDH website at http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/. The statute requires, in Minnesota Statutes 2012, 116.9402:

> (b) The department must periodically review and revise the list of chemicals of high concern at least every three years. The department may add chemicals to the list if the chemical meets one or more of the criteria in section 116.9401, paragraph (e).

2013 Chemicals of High Concern Update

MDH staff developing the Minnesota 2010 CHC list relied in part upon the state of Maine's original Chemicals of High Concern (CHC) list. The Maine statute is similar to that of Minnesota's statute and the original Maine CHC list was published in July of 2009, making it available before work on Minnesota's CHC list began. Maine's original CHC list contained a large number of chemicals (1739) and, given the relatively short time frame for the creation of Minnesota's CHC list, it was not possible to carefully review all chemicals on the Maine CHC list. This means that a large portion of the Maine CHC list was retained for the Minnesota 2010 CHC list (Minnesota Department of Health, 2010) without opportunity to verify that each chemical's profile adhered to the toxicity or persistence and bioaccumulative criteria adopted by MDH.

The update of the Minnesota CHC list involved reviewing each of the 1,756 chemicals on the 2010 list. The work on each chemical included a rapid evaluation of the data needed to meet the Minnesota requirements for a CHC. The result of this review was to either retain the chemical on the Minnesota CHC list or flag the chemical for additional, in-depth review. The same method was conducted while reviewing other authoritative lists and considering the inclusion of chemicals for the 2013 CHC list which were not on the 2010 CHC list.

For example, if a chemical was listed as persistent, bioaccumulative, and toxic (PBT) based on Maine's CHC list, staff found the papers or reports that Maine cited, read through the information, and decided whether the data met Minnesota's criteria for PBT (or other toxic endpoints). If staff determined that the criteria were met, the chemical stayed on the list. However if the data cited by Maine did not meet Minnesota's criteria or if no empirical data (measured or experimental data) could be found from the original source, then staff searched for and evaluated additional data, looking in data bases and the scientific literature for chemical data that might meet the Minnesota CHC criteria.

While the Maine CHC list was used as a starting point for the original Minnesota CHC list it was not the only source used. Other sources to identify potential chemicals for the 2010 CHC list included high production volume chemicals (HPV) named by the EPA; Priority Persistent Pollutants named by the Oregon Department of Environmental Quality; chemicals with non-cancer endpoints in the EPA Integrated Risk Information System (IRIS); Minnesota Health-Based Guidance for drinking water and air; and other sources named in Minnesota Statute 116.9402 (2012). Examples of sources used to evaluate a chemicals candidacy included but were not limited to:

- U.S. Department of Health and Human Services (HHS)
  - Agency for Toxic Substances and Disease Registry (ATSDR)
  - National Institutes of Health (NIH)
    - National Toxicology Program (NTP)
    - National Library of Medicine (NLM)
      - Hazardous Substances Data Bank (HSDB)
      - PubMed

- ChemID
- U.S. Environmental Protection Agency
  - Office of Pollution Prevention and Toxics (OPPT)
  - Integrated Risk Information System (IRIS)
  - High Production Volume Challenge Program
    - Hazard Characterization
    - Risk-Based Prioritizations
- California Environmental Protection Agency (CA EPA)
  - Office of Environmental Health Hazard Assessment
    - California Proposition 65 (CAL Prop 65)
- World Health Organization (WHO)
  - International Agency for Research on Cancer (IARC)
- European Commission (EC)
  - European chemical Substances Information System (ESIS)
- Organisation for Economic Co-operation and Development (OECD)
  - eChemPortal
- Government of Canada
  - Chemical Substances
  - Health Canada
  - Environment Canada

Chemicals with credible scientific data that met the CHC criteria were retained. If no data or inadequate data (not reliable or did not meet CHC criteria) was found then the chemical was flagged for exclusion from the 2013 CHC list.

During this round of review there was a particular focus on chemicals which were listed as PBT and had either the Canada persistent, bioaccumulative, and inherently toxic (PBiT) list or the Oslo-Paris (OSPAR) Commission as their source. Chemicals listed on the Canada PBiT list were more closely reviewed for two reasons: 1) Canada recently published more information about several of these chemicals under "The Challenge" program, allowing for a more in-depth review of this data set (Government of Canada, 2011). 2) Many chemicals on Canada's PBiT list were identified through modeled data which has since been updated.

MDH took the additional step of analyzing PBT data using an EPA model when it was apparent that the only data available for a chemical were modeled (estimated) PBT data. For example, MDH staff reviewed the information collected by Environment Canada for the PBiT chemicals and determined whether the PBT information was estimated or measured in a field or laboratory study. When only modeled (estimated) data were reported, staff validated the results by using the EPA's online PBT screening tool, PBT Profiler. This EPA-developed model predicts the potential for PBT activity based on the structure of the chemical. MDH used the most recently updated version of this EPA tool to check many of the Canada PBiT chemicals (U.S. Environmental Protection Agency, 2012). If PBT profiler indicated that a chemical was not expected to have PBT activity then the chemical was no longer considered PBT. The results of

the PBT model are predictive and are only used when experimental or measured data are not available.

The OSPAR Commission uses more inclusive PBT criteria than most other agencies or organizations, including the PBT criteria MDH uses from the EPA (Oslo-Paris Commission, 2002). Some chemicals classified by OSPAR as PBT would not be considered PBT by MDH. Table 1 provides an example of how the two sets of PBT criteria are different. Because of this discrepancy in PBT definitions, it was important to review chemicals with the OSPAR PBT source.

Table 1: Comparison of PBT Criteria

PBT Criteria		
	OSPAR	MDH[1]
Persistence (water and soil)	≥ 50 Days	60 – 180 Days
Bioconcentration Factor (BCF)	≥ 500	1000 - 5000
Toxicity	Acute[2]: ≤1.0 mg/L Chronic[3]: ≤0.1 mg/L	Acute[2]: >1 - 10 mg/L Chronic[3]: >0.1 - 10 mg/L

1: MDH 'Moderate' values. Values are categorized as low, moderate, or high by MDH
2: LC_{50} or EC_{50}
3: LOEC, NOEC, or ChV

Through this update and review process MDH identified 57 chemicals for exclusion from the 2013 CHC list (Appendix 1). A majority of these chemicals were excluded because modeled PBT data could not be validated. Chemicals were also removed because they were exempted by statute, new experimental data were available, or for other reasons (see appendix 1 for removal reasons).

The review of the CHC list includes considering if there are chemicals which should be added to the list. MDH monitors new toxicity literature as well as updates to state, national, and international agency lists. As a result MDH identified 32 chemicals to add to the 2013 CHC list (Appendix 2). These chemicals were found on authoritative state, national, and/or international chemical hazard lists and met the Minnesota CHC list requirements. The names of these organizations and the reviewed lists can be found in appendix 2.

After this review and update the total number of chemicals on the CHC list decreased from 1,756 in 2010 to 1,731 in 2013. The review and revision process of the CHC list (and PC list) is viewed as a dynamic and continuous process. There are around 260 chemicals on the 2013 CHC list that are flagged for further review in the coming year. New data and information will be considered for future list updates. Updates to the CHC list can be expected at least every three years as mandated in Minnesota Statutes 2012, 116.9402 (Minnesota Statutes 2012).

Work Plan

The following section describes some of the future work activities MDH plans for updating the CHC and PC lists. Activities include thoroughly reviewing the PC list, considering new candidate PC chemicals, evaluating CHC chemicals which have been flagged for further review, and reevaluating the status of high production volume chemicals using information recently released by EPA. MDH will also be updating the chemical hazard guidelines it uses while assessing and prioritizing chemical toxicity.

Priority Chemicals

The 2009 Minnesota legislation called for the creation of a Priority Chemical (PC) list. This list is built from the CHC list and is defined in Minnesota Statutes 2012, 116.9403 (Minnesota Statutes 2012):

> (a) The department, after consultation with the agency, may designate a chemical of high concern as a priority chemical if the department finds that the chemical:
>
> (1) Has been identified as a high-production volume chemical by the United States Environmental Protection Agency; and
>
> (2) Meets any of the following criteria:
> (i) The chemical has been found through biomonitoring to be present in human blood, including umbilical cord blood, breast milk, urine, or other bodily tissues or fluids;
> (ii) The chemical has been found through sampling and analysis to be present in household dust, indoor air, drinking water, or elsewhere in the home environment; or
> (iii) The chemical has been found through monitoring to be present in fish, wildlife, or the natural environment.
>
> (b) By February 1, 2011, the department shall publish a list of priority chemicals in the State Register and on the department's Internet Web site and shall update the published list whenever a new priority chemical is designated.

The original and current list of priority chemicals consist of the following nine chemicals:

- bisphenol A (BPA)
- butyl benzyl phthalate (BBP)
- dibutyl phthalate (DBP)
- di (2-ethylhexyl) phthalate (DEHP)
- decabromodiphenyl ether (decaBDE)
- hexabromocyclododecane (HBCD)
- lead

- cadmium
- formaldehyde

After creating the 2010 PC list, the TFK program nominated all nine chemicals to the MDH Contaminants of Emerging Concern (CEC) program. The CEC program reviews substances that have been released to, found in, or have the potential to enter Minnesota waters. The substances reviewed in this program also pose a real or perceived health threat, have new or changing health or exposure information, or do not have a Minnesota human health-based guidance value. Since their nominations, three of the nine priority chemicals have gone through a full CEC review. These three chemicals, BPA, BBP, and DBP, now have a Minnesota health-based guidance value for exposure from water ingestion. The CEC program is currently in the process of reviewing DEHP and the remaining priority chemicals are on the CEC nominations list for future consideration (for more information on the CEC program visit http://www.health.state.mn.us/cec).

MDH is in the process of reviewing other chemicals for PC list inclusion and will provide updates at a later time. Currently MDH is reviewing one candidate chemical and one candidate chemical group for addition to the PC list. The chemical is tris(1, 3-dichloro-2-propyl)phosphate (TDCPP) and the chemical group is nonylphenol including its ethoxylates (see Appendix 3 for CAS numbers). The term 'candidate chemical' is used purposefully to indicate that these chemicals are under consideration but have not at this time been added to the PC list. MDH is working with its state partners to assess the data for these candidate chemicals in a way that ensures consistency in priority chemical listing. MDH updates the PC list through publication on the MDH website at http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/priority.html. Interested parties can monitor changes in the lists by visiting the web site and signing up to receive GovDelivery e-mail notices of new activities and postings.

High Production Volume Chemicals

A high production volume (HPV) chemical is a chemical that is manufactured or imported into the U.S. in quantities of one million pounds or more per year. Minnesota's statutory definition of a PC requires that the chemical be a HPV chemical named by the EPA. Because the PC list must be derived from the CHC list, HPV chemicals are reviewed for inclusion on the CHC list.

Under the U.S. Toxic Substances Control Act (TSCA), manufacturers or importers of a chemical in the quantity of 25,000 pounds or more per year must report to the EPA during what was called the Inventory Update Reporting (IUR) cycle, which occurred every four years. For the original publication of the 2010 CHC list, MDH retrieved IUR lists available from approximately the past 20 years, which included inventories for 1990, 1994, 1998, 2002, and 2006. Because HPV chemicals can vary over time and reviewing all the HPV chemicals of the past 20 years was impractical, MDH focused on chemicals that were listed on both the most recent inventory of the time, 2006, and on three of four remaining inventories from 1990-2002. After reviewing chemicals that fit these HPV criteria, as well as the health endpoint and hazard criteria of a CHC

chemical, 443 chemicals were designated as HPV on the 2010 CHC list. This HPV status is shown on the 2010 CHC list by an "x" in the HPV column.

In February of 2013 the EPA released the non-confidential 2012 Chemical Data Reporting (CDR) information (U.S. Environmental Protection Agency, 2013). The CDR replaces the IUR cycle and is the first update of chemical reporting on HPV information since the final IUR in 2006. The 2012 CDR provided information for 7,674 individual chemicals. MDH is in the process of reviewing the chemical information presented. MDH will also consider re-evaluating the HPV criteria established for the 2010 CHC list

While there is a large amount of information to analyze, MDH has confirmed that eight of the nine PCs are still reported as HPV chemicals in the 2012 CDR. One PC, HBCD, has production volume information withheld in the 2012 CDR. The annual production volume range was 10 million to 50 million pounds for each IUR cycle from 1994 through 2006. Without additional information, MDH will continue to consider HBCD to be a HPV chemical at this time. This means that none of the chemicals currently listed on the PC list will be removed as a result of a change in HPV status.

Moving forward, MDH will continue to review the 2012 CDR information to identify chemicals which meet the HPV criteria and may be considered for CHC and PC list inclusion(s). It is also possible that after reviewing the 2012 CDR data, chemicals currently listed on the 2013 CHC list as HPV will no longer meet the HPV criteria. When the review of this information is complete, MDH will update the HPV status (as indicated by an "x" in the HPV column) of any effected chemicals on the 2013 CHC list. This update will be posted on-line at the MDH website http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/

Toxicity Criteria

The statutory criteria states that a CHC needs to be "known or suspected with a high degree of probability" to cause adverse health effects, or be a chemical that is PBT, or be very persistent and very bioaccumulative (vPvB). Because "high degree of probability" was not defined and because time and resources to develop a full process for chemical evaluation were limited in 2010, MDH relied on work already done by the EPA for determining likelihood of a chemical to cause harm. MDH used hazard guidelines established by the EPA's Chemical Assessment and Management Program (ChAMP). The ChAMP program developed guidelines based on lowest-observed-adverse-effect-level (LOAEL) from mammalian toxicity studies which classified chemicals into categories of "High", "Moderate", or "Low" toxicity. More information about ChAMP and why the ChAMP criteria were initially used can be found in MDH's 2010 publication on CHC list methodology or from the EPA (Minnesota Department of Health, 2010; U.S. Environmental Protection Agency, 2010).

Because the ChAMP program is no longer active at the EPA, MDH decided it is prudent to use hazard guidelines of an updated and active program. After reviewing process documentation of programs within the EPA, it was determined that MDH would use the hazard guidelines

established by the Design for the Environment (DfE) Alternatives Assessment program which has a framework and use similar to ChAMP. EPA's DfE program works to identify safer chemical alternatives that reduce the risk to people and the environment while still performing well and being cost effective.

DfE has developed the Alternatives Assessment Criteria for Hazard Evaluation to be used as a tool for evaluating and comparing chemicals based on their human health and environmental hazards (U.S. Environmental Protection Agency, 2011). Similar to ChAMP, DfE identifies hazard categories of "High", "Moderate", or "Low". DfE also includes a "Very High" or "Very Low" hazard category for some of the endpoints.

The DfE Alternatives Assessment program created a rigorous and useful system for comparing chemicals based on hazard criteria that could be used by other agencies and organizations. In developing the criteria, DfE used authoritative sources such as the United Nation's Globally Harmonized System (GHS) for the Classification and Labeling of Chemicals and other EPA programs such as the Office of Pollution Prevention & Toxics (OPPT) criteria for HPV chemical categorization (U.S. Environmental Protection Agency, 2011). The DfE program gave careful consideration to selecting the toxicity value ranges which would categorize a chemical within different hazard groups. These ranges and the included health endpoints are generally agreed upon by other national and international organizations as being appropriate for chemical hazard identification.

For example, the included health endpoints are those from the Screening Information Data Set (SIDS) used by the international organization, OECD, for assessing chemical hazards. Some of these health endpoints include reproductive and developmental toxicity, neurotoxicity, repeated dose toxicity, aquatic toxicity, and acute mammalian toxicity. All health hazard endpoints that MDH used in chemical classification under the ChAMP program are included in the DfE Alternatives Assessment criteria.

An area of difference between ChAMP and DfE is that the range of values for a health endpoint which would classify a chemical as 'Moderate' or of a greater hazard category in ChAMP has expanded for a few of the endpoints in DfE. One example of this is within the aquatic toxicity endpoint. Under ChAMP a chemical would have a moderate hazard designation for acute aquatic toxicity with a lethal concentration 50 (LC_{50}) or effective concentration 50 (EC_{50}) of >1-10 mg/L. Under the DfE Alternatives Assessment a chemical would have a moderate hazard designation for acute aquatic toxicity with an LC_{50} or EC_{50} of >10-100 mg/L (see table 2). For other health endpoints, the toxicity values within a hazard category are exactly the same (e.g., repeated dose toxicity criteria). The document detailing the DfE Alternatives Assessment criteria for hazard evaluation can be found at EPA's website for DfE (U.S. Environmental Protection Agency, 2011).

Table 2: Comparison of Hazard Category Ranges

Aquatic Toxicity Criteria				
	Acute LC_{50} or EC_{50} (mg/L)			
Guideline	**Very High**	**High**	**Moderate**	**Low**
ChAMP	N/A	≤ 1.0	> 1.0 - 10	> 10
DfE	< 1.0	1.0 - 10	> 10 - 100	> 100

As previously mentioned, this transition from ChAMP to DfE uses a broader range of toxicity values for certain health endpoint hazard classifications. Therefore a CHC previously reviewed by MDH using the ChAMP criteria would be in either the same hazard classification level under DfE or could have increased in hazard classification (from moderate to high). This means that chemicals will not need to be reviewed for a decrease in hazard level classification. No chemicals currently on the 2013 CHC list will need to be removed due to the use of the DfE Alternatives Assessment hazard guidelines. The change of guidelines from ChAMP to DfE does potentially increase the pool of chemicals which could be considered "Moderate" toxicity for some of the health endpoints (e.g., acute aquatic toxicity and acute mammalian toxicity).

Moving forward MDH will use these DfE Alternatives Assessment criteria as part of the process to determine if chemicals pose a potential health hazard qualifying them for the CHC list. MDH will consider all relevant routes of exposure including oral, inhalation, and dermal and will use the Lowest Observed Adverse Effect Level/Lowest Observed Adverse Effect Concentration (LOAEL/LOAEC) or the No Observed Adverse Effect Level/No Observed Adverse Effect Concentration (NOAEL/NOAEC) identified in published peer reviewed studies and/or authoritative agency reports to determine hazard categories. In a review process which includes conflicting data, a weight of evidence approach will be applied in making the hazard determination. Chemicals which fall into hazard categories of "Moderate", "High", or "Very High" will be considered for CHC list inclusion.

States Legislative Updates

In Minnesota, a bill that would have amended the current CHC and PC statutes was introduced in January of 2013. It would have added chemical reporting requirements for the Minnesota PC list similar to the reporting requirements of the state of Washington's Chemicals of High Concern to Children list (CHCC). However, this bill was not passed out of committee thus resulting in no change to the existing Minnesota statutes.

Two other bills involving chemicals on the PC list were passed into Minnesota law during the 2013 legislative session. The first bill (Senate File 357) bans the use of formaldehyde in certain products intended for children less than 8 years of age. The second bill (Senate File 379) prohibits the sale of baby food, infant formula, and toddler food stored in a container that contains bisphenol A. Copies of both bills can be found at the Minnesota State Legislature website by searching for the bill numbers in the 88th legislative session at https://www.revisor.mn.gov/bills/status_search.php?body=Senate.

The remainder of this section provides some brief updates to the status of the chemical lists for both Maine and Washington. This update is provided because both Maine and Washington have legislation that is similar to the Minnesota statute and both states' lists were used as starting points in the original creation of Minnesota's 2010 CHC list. There is also a brief update on proposed chemical legislation in other states for 2013.

Maine

Maine's 2009 law was amended in June of 2011. The amendment changed Maine's system from a two tiered system of prioritization to a three tiered system of prioritization. The three tiers in increasing level of prioritization are:

1. The Chemicals of Concern (COC) list;
2. The Chemicals of High Concern (CHC) list; and
3. The Priority Chemical (PC) list.

The newly created COC list is similar to Maine's 2009 CHC list but removes already regulated pesticides and pharmaceuticals, leaving a more focused list of approximately 1400 chemicals.

Another requirement of the amended law was to publish between 10 and 70 chemicals on the new CHC list. This new CHC list was published in July 2012 and is a subset of the COC list. For a chemical on the Maine COC list to be promoted to the Maine CHC list there needs to be strong evidence that the chemical is a developmental or reproductive toxicant, an endocrine disruptor, or human carcinogen (COC list criteria) and the chemical must meet one or more of the following:

- Through biomonitoring studies to be present in human blood, human breast milk, human urine or other bodily tissues or fluids;

- Through sampling and analysis to be present in household dust, indoor air or drinking water or elsewhere in the home environment; or
- To have been added to or is present in a consumer product used or present in the home.

This newly created CHC list has 49 chemicals. From this list the commissioner of the Maine Department of Environmental Protection (Maine DEP) can designate one or more of the chemicals on the CHC list as a priority chemical (PC). When a chemical is promoted to the PC list the Maine DEP has the authority to:

1. Require manufacturers to disclose use of the PC in certain consumer product categories;
2. Require an alternatives assessment of the PC (the only state currently implementing this authority); and
3. Recommend a state-wide sale prohibition based on information gathered in the first two items.

Currently the two chemicals listed on the Maine PC list are bisphenol A and nonylphenol (including its ethoxylates). More information on all three of Maine's chemical lists can be found at the Maine DEP website http://www.maine.gov/dep/safechem/index.html (Maine Department of Environmental Protection, 2011).

Washington

The state of Washington also has similar legislation to the Minnesota statute, called the Children's Safe Product Act (CSPA). However, unlike Minnesota and Maine, Washington has only one chemical list called the Chemicals of High Concern for Children (CHCC). The current Washington CHCC list contains 66 chemicals. Chemicals on this list are considered toxic and have been found in children's products or have been found to be present in human tissue. These criteria for the CHCC list make it similar to Maine's new 2012 CHC list and to Minnesota's PC list. All nine of Minnesota's PCs can be found on the Washington CHCC list.

The major area in which Washington's chemical legislation differs from that of Minnesota and Maine is that Washington has a reporting requirement associated with the CHCC list and the information collected is available on-line (Washington Department of Ecology, 2009). Final rules were adopted in July of 2011 which required manufacturers of children's products to report to the Washington Department of Ecology if their products contained any of the 66 chemicals on the CHCC list. The reporting timeline is staggered based on the size of the manufacturer and the intended use of the children's product. Thus, the first deadline to report was in August of 2012 with each subsequent round of reporting following in six month increments. As of the writing of this report Washington has published results on the first two rounds of manufacturer product reporting.

Washington's CHCC list is dynamic, just as Minnesota's and Maine's lists are, and may change as new information becomes available. Recently, Washington has initiated the process of adding a new chemical, tris(1, 3-dichloro-2-propyl)phosphate (TDCPP), to the CHCC list and removing n-butanol from the CHCC list. Both of these changes were in response to petitions under the State's Administrative Procedures Act. These changes to the CHCC list will likely be completed by November 2013. More information on Washington's CSPA as well as reporting information and data can be found at the Washington Department of Ecology website http://www.ecy.wa.gov/programs/swfa/cspa/ (Washington Department of Ecology, 2009).

Other States

As of the writing of this report, the states of California, Oregon, and North Carolina have proposed similar legislation.

California's proposed legislation, titled Safer Consumer Products regulations, would create two lists of hazardous chemicals titled Candidate Chemicals (CC) and Chemicals of Concern (COC). The COC list would be built from the CC list and would represent chemicals with particular hazard traits combined with exposure concerns. This regulation would then create a consumer products list, titled Priority Products, for certain consumer products containing COCs. Consumer products listed on the Priority Products list would be subject to alternatives analyses to limit exposure to the COC(s) contained within them as well as a possible regulatory response. The alternatives analysis is the key portion of this regulation that would set it apart from other state chemical laws. More information can be found at the California Department of Toxic Substances Control website (California Department of Toxic Substances Control, 2013).

Oregon's proposed legislation would create a list of "high priority chemicals of concern" for children's health. It would also require product reporting similar to that of the state of Washington's and includes a provision for eventual removal of high priority chemicals of concern from certain children's products. The House version of this bill was recently voted on and passed. More information can be found at the Oregon State Legislature website by searching for House Bill (HB) 3162 (Oregon State Legislature, 2013).

In North Carolina a bill has been proposed to study children's health and toxic chemicals. The bill (General Assembly of North Carolina House Bill 848) creates a joint legislative study committee to investigate ways to protect children from health impacts of potentially toxic chemicals which can be found in children's products. The study committee would also examine other federal and state laws which are intended to prevent children's exposure to toxic chemicals and determine a strategy for the state of North Carolina to identify "chemicals of high concern" and "priority chemicals". The North Carolina current definitions of "chemicals of high concern" and "priority chemicals" are similar to Minnesota's statutory definitions of the CHC and PC lists. The bill can be found at the North Carolina General Assembly website for House Bill (HB) 848 (North Carolina General Assembly, 2013-2014).

Summary

The review of the Minnesota CHC list is a continuous process which can result in chemical removals and additions to the list. This update to the Minnesota 2013 CHC list has resulted in 57 chemicals being excluded and 32 chemicals being added, changing the size of the CHC list from 1,756 chemicals in 2010 to 1,731 chemicals in 2013. Around 260 chemicals have been flagged for further review in the coming year.

Moving forward, MDH is in the process of reviewing one candidate chemical (tris(1, 3-dichloro-2-propyl)phosphate (TDCPP)) and one candidate chemical group (nonylphenol including its ethoxylates), for potential additions to the PC list. MDH is working with its state partners to assess the data for these candidate chemicals in a way that ensures consistency in priority chemical listing.

MDH is currently analyzing the EPA's recently released 2012 CDR data in order to review the HPV status of chemicals on the 2013 CHC list. Once this review is completed, HPV chemical status of CHCs will be updated on the MDH website at http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/

MDH is now using the EPA's DfE Alternatives Assessment Program chemical hazard criteria when assessing and prioritizing chemical toxicity (U.S. Environmental Protection Agency, 2011). This program incorporates nationally and internationally agreed upon hazard criteria and health hazard endpoints. It will replace the EPA ChAMP guidelines which MDH had previously used in developing the 2010 CHC list.

MDH continues to monitor the status of chemical hazard legislation in other states. In particular, chemical hazard legislation of the states of Maine and Washington are monitored closely because of similar bill language and mandates to that of Minnesota's. MDH monitors the status of chemical legislations across the country to understand the similar actions being taken by other states and to gather information on the direction of chemical policies within the United States.

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Appendix 1

Chemicals Excluded from the 2013 CHC List: Reasons for Removal

	Chemical Name	CAS Registry Number	Statute Exemption	Model Not Validated	Lacks Empirical Data	New Data
1	Testosterone and its esters	58-22-0	X[1]			
2	1,4-pentanediamine, N4-(6-chloro-2-methoxy-9-aziridinyl)-N1,N1-diethyl-, dihydrochloride	69-05-6	X[1]			
3	9H-Carbazole-3-carboxamide, N-(4-chlorophenyl)-2-hydroxy-	132-61-6		X[4]	X	
4	Diosgenin	512-04-9	X[1]			
5	2-Naphthalenol, 1-[(2-nitrophenyl)azo]- (C.I. Pigment Orange 2)	6410-09-9				X[5]
6	1-Naphthalenesulfonic acid, 4-hydroxy-3-[[4'-[(1-hydroxy- 5-sulfo-2-naphthalenyl)azo]-3,3'-dimethyl[1,1' -biphenyl]-4-yl]azo]-, disodium salt	6420-06-0		X[4]	X	
7	Spiro[isobenzofuran-1(3H),9'-[9H]xanthen]-3-one, 2',4',5',7'-tetrabromo-3',6'-dihydroxy- (D & C Red no. 21)	15086-94-9				X[5]
8	1-Nonanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-nonadecafluoro-, ammonium salt	17202-41-4		X[6]	X	
9	Benzoxazolium, 2-[3-[5,6-dichloro-1-ethyl- 1,3-dihydro-3-(3-sulfopropyl)-2H-benzimidazol-2 -ylidene]-1-propenyl]-3-ethyl-, hydroxide, inner salt	19163-98-5		X[4]	X	
10	Propanenitrile, 3-[[4-[(5,6-dichloro-2-benzothiazolyl) azo]phenyl]ethylamino]-	25176-89-0				X[5]
11	1H-Benzimidazolium, 5,6-dichloro-2-[3-(5,6-dichloro- 1,3-diethyl-1,3-dihydro-2H-benzimidazol-2-ylidene)-1-propenyl]-1-ethyl-3-(3-sulfobutyl)-, hydroxide, inner salt	28118-10-7		X[4]	X	

	Chemical Name	CAS Registry Number	Statute Exemption	Model Not Validated	Lacks Empirical Data	New Data
12	Benzenesulfonic acid, 4-[[3-[[2-hydroxy-3-[[(4-methoxyphenyl)amino]carbonyl]-1-naphthalenyl]azo] -4-methylbenzoyl]amino]-, calcium salt (2:1)	43035-18-3				X[5]
13	Ethanol, 2,2'-[[4-[(2,6-dibromo-4-nitrophenyl)azo]phenyl]imino]bis-, diacetate (ester) (EDD)	55619-18-6				X[5]
14	ß-Alanine, N-[4-[(2-bromo-6-chloro-4- nitrophenyl)azo]phenyl]-N-(3-methoxy-3-oxopropyl)-, methyl ester (Disperse Yellow Brown)	59709-38-5				X[5]
15	1-Propanaminium, 3-[[4-[(2,4-dimethylphenyl) amino]-9,10-dihydro-9,10-dioxo-1-anthracenyl]amino]-N,N,N-trimethyl-, methyl sulfate	60352-98-9		X[4]	X	
16	3-Pyridinecarbonitrile, 5-[(2-cyano-4-nitrophenyl) azo]-2-[(2-hydroxyethyl)amino]-4-methyl-6-[[3-(2 -phenoxyethoxy)propyl]amino]-	61799-13-1		X[4]	X	
17	3-Pyridinecarbonitrile, 5-[[2-chloro-4-(methylsulfonyl) phenyl]azo]-4-methyl-2,6-bis[[3-(2-phenoxyethoxy)propyl]amino]-	63281-10-7		X[4]	X	
18	3-Pyridinecarbonitrile, 5-[(2-cyano-4-nitrophenyl) azo]-6-[(2-hydroxyethyl)amino]-4-methyl-2-[[3-(2 -phenoxyethoxy)propyl]amino]- (Disperse Red)	63833-78-3		X[4]	X	
19	Glu-P-2 (2-Aminodipyrido[1,2-a:3',2'-d]imidazole)	67730-10-3	X[2]			
20	Glu-P-1 (2-Amino-6-methyldipyrido[1,2- a:3',2'-d]imidazole)	67730-11-4	X[2]			
21	1-Heptanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-, ammonium salt	68259-07-4		X[6]	X	

	Chemical Name	CAS Registry Number	Statute Exemption	Model Not Validated	Lacks Empirical Data	New Data
22	2,7-Naphthalenedisulfonic acid, 4-amino-5-hydroxy-6-[[4'- [(4-hydroxyphenyl)azo]-3,3'-dimethyl[1,1'-biphenyl]-4-yl]azo]-3-[(4-nitrophenyl)azo]-, disodium salt	68400-36-2		X[4]		
23	Propanenitrile, 3-[[2-(acetyloxy)ethyl][4- [(2-chloro-4-nitrophenyl)azo]-3-methylphenyl]amino]-	68516-64-3		X[4]	X	
24	Ethanamine, N-ethyl-N-hydroxy-, reaction products with hexamethylcyclotrisiloxane, silica and 1,1,1-trimethyl-N-(trimethylsilyl)silanamine	68583-58-4			X	X[5]
25	Siloxanes and Silicones, Me 3,3,3-trifluoropropyl, Me vinyl, hydroxy-terminated	68952-02-3			X	X[5]
26	1-Heptanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)	70225-15-9		X[6]	X	
27	1-Naphthalenamine, 4-[(2-bromo-4,6-dinitrophenyl) azo]-N-(3-methoxypropyl)-	70660-55-8		X[4]	X	
28	Siloxanes and Silicones, di-Me, hydrogen-terminated	70900-21-9				X[5]
29	2-Naphthalenesulfonic acid, 5-[[4-(4-cyclohexylphenoxy) -2-sulfophenyl]azo]-6-[(2,6-dimethylphenyl)amino]-4-hydroxy-, disodium salt	71720-89-3		X[4]	X	
30	2-Naphthalenecarboxylic acid, 4-[(5-chloro-4-methyl-2-sulfophenyl) azo]-3-hydroxy-, magnesium salt (1:1)	71832-83-2				X[5]
31	Benzenesulfonic acid, 3-[[4-amino-9,10-dihydro- 9,10-dioxo-3-[sulfo-4-(1,1,3,3-tetramethylbutyl)phenoxy]-1-anthracenyl]amino]-2,4,6-trimethyl-, disodium salt	72243-90-4				X[5]

	Chemical Name	CAS Registry Number	Statute Exemption	Model Not Validated	Lacks Empirical Data	New Data
32	1,3-Benzenedicarbonitrile, 2-[[4-[[2-(acetyloxy)ethyl] butylamino]-2-methylphenyl]azo]-5-nitro-	72828-64-9		X[4]	X	
33	1-Propanaminium, 3-[[9,10-dihydro-4-[(4-methylphenyl) amino]-9,10-dioxo-1-anthracenyl]amino] -N,N,N-trimethyl-, methyl sulfate	72828-93-4		X[4]	X	
34	Benzenamine, 4-[(2,6-dichloro-4-nitrophenyl) azo]-N-(4-nitrophenyl)- (DNAN)	72927-94-7				X[5]
35	2,4,10-Trioxa-7-azaundecan-11-oic acid, 7-[4-[(2,6-dichloro-4-nitrophenyl) azo]-3-methylphenyl]-3-oxo-, methyl ester	73003-64-2		X[4]	X	
36	3-Pyridinecarbonitrile, 5-[(9,10-dihydro-9,10-dioxo- 1-anthracenyl)azo]-2,6-bis[(2-methoxyethyl)amino]-4-methyl-	73398-96-6		X[4]	X	
37	Benzenesulfonic acid, oxybis[(1,1,3,3-tetramethylbutyl)-, dipotassium salt	75908-83-7		X[4]	X	
38	Butanamide, 2-[[3,3'-dichloro-4'-[[1- [[(2-chlorophenyl)amino]carbonyl]-2-oxopropyl]azo][1,1'-biphenyl]-4-yl]azo]-N-(2,4-dimethylphenyl)- 3-oxo-	78952-70-2		X[4]	X	
39	Benzenesulfonic acid, 2,2'-[(9,10-dihydro-5,8-dihydroxy- 9,10-dioxo-1,4-anthracenediyl)diimino]bis [5-(1,1-dimethylethyl)-, disodium salt (ADIBSS)	83006-67-1		X[4]	X	
40	1,7-Naphthalenedisulfonic acid, 6-[[2-(4-cyclohexylphenoxy) phenyl]azo]-4-[[(2,4-dichlorophenoxy)acetyl]amino]-5-hydroxy-, disodium salt	83027-51-4		X[4]	X	

	Chemical Name	CAS Registry Number	Statute Exemption	Model Not Validated	Lacks Empirical Data	New Data
41	1,7-Naphthalenedisulfonic acid, 6-[[2-(2-cyclohexylphenoxy) phenyl]azo]-4-[[(2,4-dichlorophenoxy)acetyl]amino]-5-hydroxy-, disodium salt	83027-52-5		X[4]	X	
42	Benzonitrile, 3-bromo-2-[[4-(diethylamino) -2-methylphenyl]azo]-5-methyl-	83249-49-4		X[4]	X	
43	3-Pyridinecarbonitrile, 5-[[2-chloro-4-(phenylazo) phenyl]azo]-2,6-bis[(3-methoxypropyl)amino]-4-methyl -	85392-21-8		X[4]	X	
44	Benzenesulfonic acid, 5-amino-2,4-dimethyl-, diazotized, coupled with diazotized 2,4-, 2,5-and 2,6-xylidine and 4-[(2,4-dihydroxyphenyl)azo]benzenesulfonic acid, sodium salts	90218-20-5		X[6]	X	
45	2,7-Naphthalenedisulfonic acid, 5-amino-4-hydroxy-3-[[6-sulfo- 4-[(4-sulfo-1-naphthalenyl)azo]-1-naphthalenyl]azo]-, diazotized, coupled with diazotized 4-nitrobenzenamine and resorcinol, potassium sodium salts	90459-02-2		X[6]	X	
46	phenol, nonyl-, manuf. of, by-products from, high-boiling	90481-05-3		X[6]	X	
47	[2,6'-Bibenzothiazole]-7-sulfonic acid, 2'-(4-aminophenyl)-6-methyl-, diazotized, coupled with diazotized 4-aminobenzenesulfonic acid and resorcinol, sodium salts	91696-90-1		X[6]	X	
48	Naphthalenesulfonic acid, reaction products with formaldehyde and hydroxybenzenesulfonic acid, ammonium salts	93384-84-0		X[6]	X	
49	Phenol, 4-[[2-methoxy-4-[(2-methoxyphenyl) azo]-5-methylphenyl]azo]- (MMMP)	93805-00-6				X[5]

	Chemical Name	CAS Registry Number	Statute Exemption	Model Not Validated	Lacks Empirical Data	New Data
50	Fatty acids, tallow, hydrogenated, [6-[bis(methoxymethyl)amino] -1,3,5-triazine-2,4-diyl]bis[[(methoxymethyl)imino]methylene] ester	103331-97-1	X[3]		X	
51	Fatty acids, tallow, hydrogenated, hexaesters with 2-[[[4-[[[2-hydroxy-1-(hydroxymethyl) ethoxy]methyl](hydroxymethyl)amino]-6 -[(hydroxymethyl)(methoxymethyl) amino]-1,3,5-triazi n-2-yl](methoxymethyl)amino]methoxy]-1,3-propanediol	103331-98-2	X[3]		X	
52	Formaldehyde, reaction products with branched nonylphenol and xylenol, ethoxylated	104376-69-4		X[6]	X	
53	Alkenes, C12-14, hydroformylation products, distn. residues, ethoxylated propoxylated, dihydrogen phosphates, sodium salts	113089-51-3		X[6]	X	
54	Formaldehyde, reaction products with sulfonated 1,1'-biphenyl and sulfonated terphenyl, sodium salts	113163-36-3		X[6]	X	
55	1-Naphthalenediazonium, 4-[[4-[(4-nitro-2-sulfophenyl) amino]phenyl]azo]-6-sulfo-, chloride, reaction products with formaldehyde and salicylic acid, ammonium sodium salts	114910-04-2		X[6]	X	
56	Alkenes, C12-14, hydroformylation products, distn. residues, ethoxylated, dihydrogen phosphates, sodium salts	119209-64-2		X[6]	X	
57	9,10-Anthracenedione, 1,4-bis[(4-methylphenyl)amino]-, sulfonated, potassium salts (AMS)	125351-99-7				X[5]

1: Pharmaceutical
2: Food
3: Biologic
4: EPA model (PBT Profiler) estimates not PBT
5: Chemical investigated under Canada's Challenge Program. New data indicates not PBT
6: Chemical structure can't be reliably modeled by EPA program for PBT estimation

Appendix 2

Chemicals Added to the 2013 CHC List

	Chemical Name	CAS Registry Number	Authoritative List	Toxicological Endpoint
1	triphenyltin (group)	No CAS	EU Category 1 Endocrine Disruptor[1]	Endocrine Disruptor
2	DDT, technical, p,p'DDT	50-29-3	EU Category 1 Endocrine Disruptor[1]	Endocrine Disruptor
3	methanol	67-56-1	Cal Prop 65[2]	Developmental
4	Formamide	75-12-7	REACH SVHC[3]	Reproduction
5	Chloral	75-87-6	IARC[4] 2A	Carcinogenic
6	Trichloroacetic acid	76-03-9	IARC[4] 2B	Carcinogenic
7	1,3-Dichloro-2-propanol (1,3-DCP)	96-23-1	IARC[4] 2B	Carcinogenic
8	α-Methyl styrene (alpha-Methylstyrene)	98-83-9	IARC[4] 2B and Cal Prop 65 [2]	Carcinogenic
9	Methyl isobutyl ketone (MIBK)	108-10-1	IARC[4] 2B	Carcinogenic
10	Diethanolamine	111-42-2	IARC[4] 2B	Carcinogenic
11	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	REACH SVHC[3]	Reproduction
12	Bis(2-methoxyethyl) phthalate (DMEP)	117-82-8	Reach SVHC[3]	Reproduction
13	Monomethylarsonic acid (methylarsonic acid; MMA)	124-58-3	IARC[4] 2B	Carcinogenic
14	N,N-dimethylacetamide (DMAc)	127-19-5	Reach SVHC[3]	Reproduction
15	Chloral Hydrate	302-17-0	IARC[4] 2A	Carcinogenic
16	Tricosafluorododecanoic acid	307-55-1	REACH SVHC[3]	vPvB
17	Heptacosafluorotetradecanoic acid	376-06-7	REACH SVHC[3]	vPvB
18	1,2-Diethoxyethane	629-14-1	REACH SVHC[3]	Developmental/ Reproductive
19	2-Methylimidazole	693-98-1	IARC[4] 2B	Carcinogenic
20	4-Methylimidazole	822-36-6	IARC[4] 2B	Carcinogenic
21	tri-n-propyltin chloride	2279-76-7	EU Category 1 Endocrine Disruptor[1]	Endocrine Disruptor
22	Dibromoacetonitrile	3252-43-5	IARC[4] 2B	Carcinogenic
23	1-nitropyrene	5522-43-0	IARC[4] 2A; NTP[5] Reasonably Anticipated	Carcinogenic
24	Lead dinitrate	10099-74-8	REACH SVHC[3]	Developmental

	Chemical Name	CAS Registry Number	Authoritative List	Toxicological Endpoint
25	Asbestos (non-asbestiform Actinolite)	13768-00-8	IARC[4] 1	Carcinogenic
26	Asbestos (non-asbestiform Tremolite)	14567-73-8	IARC[4] 1	Carcinogenic
27	Formaldehyde, oligomeric reaction products with aniline	25214-70-4	Reach SVHC[3]	Carcinogenic
28	3,4',5-Trichlorobiphenyl	53555-66-1	EU Category 1 Endocrine Disruptor[1]	Endocrine Disruptor
29	beta-Triglycidyl isocyanurate (β-TGIC)	59653-74-6	REACH SVHC[3]	Mutagenic
30	Pentacosafluorotridecanoic acid	72629-94-8	REACH SVHC[3]	vPvB
31	1,3-Dinitropyrene	75321-20-9	IARC[4] 2B and Cal Prop 65 [2]	Carcinogenic
32	Microcystin-LR	101043-37-2	IARC[4] 2B; MN HRL[6]	Carcinogenic; Liver Toxicity
	Boric Acid*	11113-50-1	REACH SVHC[3]	Reproduction

1: European Union Category 1 Endocrine Disruptor (EU Category 1 Endocrine Disruptor)
2: California Proposition 65 List (Cal Prop 65)
3: Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH), Substances of Very High Concern (SVHC)
4: International Agency for Research on Cancer (IARC)
5: National Toxicology Program (NTP)
6: Minnesota Health Risk Limit (MN HRL)
*: Adding 2nd CAS Number (11113-50-1) to Boric Acid entry. Already on CHC list under CAS Number 10043-35-3

Appendix 3

Candidate Chemicals Under Consideration for the PC list

	Chemical Name	CAS Registry Number
1	tris(1,3-dichloro-2-propyl)phosphate (TDCPP)	13674-87-8
2	Phenol, 4-nonyl-, branched	84852-15-3
	Polyethylene glycol nonlyphenyl ether*	9016-45-9
	Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched*	127087-87-0

*: These two chemicals are both nonylphenol ethoxylates