Government of Canada Gouvernement du Canada

Rapid Screening Assessment of Polymers Identified from Phase Two of the Domestic Substances List Inventory Update

Environment and Climate Change Canada

Health Canada

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Synopsis

As part of the Chemicals Management Plan, the Government of Canada is assessing and managing, where appropriate, the potential health and ecological risks associated with certain polymers under the *Canadian Environmental Protection Act, 1999* (CEPA). These polymers were identified as priorities for further action following completion of categorization in 2006. A section 71 Notice for the second phase of the *Domestic Substances List* Inventory Update initiative was published in the *Canada Gazette*, Part I in December 2012 to collect data on approximately 2700 substances including polymers. As a result of this data collection exercise, 336 polymers were identified as not being in-commerce at quantities greater than 1000 kg during the 2011 calendar year. A polymer rapid screening approach was applied to these 336 polymers. It involved using conservative assumptions to identify polymers that warrant further evaluation of their potential to cause harm to either human health or the environment, and those that are expected to have a low likelihood of causing harmful ecological or human health effects.

The ecological component of the polymer rapid screening approach consisted of four main steps to identify substances that warrant further evaluation of their potential to cause harm. The first step involved identifying the substances that have similar structural characteristics to polymeric substances that have been previously subject to risk management under the *New Substances Notification Regulations* (NSNR) *(Chemicals and Polymers)*. The second and third steps of the process involved identifying polymers that are likely to have water extractability greater than 2 % and determining whether these polymers contain reactive functional groups, as described under Schedule 7 items 1 and 5 of NSNR (Chemicals and Polymers), respectively. The final step involved applying different exposure scenarios using assumptions that are protective of the environment and comparing to a conservative acute ecotoxicity value for polymers.

The human health component of the polymer rapid screening approach consisted of a process to determine whether each polymer warranted further assessment from a human health perspective. A key element of the characterization of potential risk for human health was a determination of the potential for exposure to the general population. Polymers reported to be in commerce in Canada at less than or equal to 1000 kg during the 2011 calendar year are considered to warrant further assessment if there is evidence of direct exposure (e.g., exposure from products) of the general population in Canada. Polymers that posed a potential for direct exposure were also screened against a set of criteria in order to identify those likely to pose a low hazard to human health. If the potential for exposure to a polymer is not expected or the polymer is likely to pose low hazard to human health, it is concluded that that polymer is unlikely to cause harm to human health at current levels of exposure.

Conclusion

In total, 61 polymers were identified as requiring further assessment (5 identified for both ecological and human health considerations, 13 identified for human health considerations only, and 43 identified for ecological considerations only). Based on the information available, it is concluded that the 275 polymers listed in Appendix B do not meet any of the criteria under section 64 of CEPA, since they are not entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity, that constitute or may constitute a danger to the environment on which life depends, or that constitute or may constitute a danger in Canada to human life or health.

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1. Introduction

The *Canadian Environmental Protection Act, 1999* (CEPA) (Canada 1999) requires the Minister of the Environment and Climate Change and the Minister of Health to conduct screening assessments of substances that have met the categorization criteria set out in the Act to determine whether these substances present or may present a risk to the environment or human health[1].

Under CEPA, screening assessments focus on information critical to determining whether a substance meets the criteria for defining a chemical as toxic as set out in section 64 of the Act, where:

"**64.** [...] a substance is toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that

(a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity;
(b) constitute or may constitute a danger to the environment on which life depends; or
(c) constitute or may constitute a danger in Canada to human life or health."

The Government of Canada has identified 336 substances, which are polymers[2], as candidates for a polymer rapid screening assessment, a component of the approach to address priority polymers on the *Domestic Substances List* (DSL) (Environment Canada, Health Canada 2014). These 336 polymers were not identified as being in commerce at greater than 1000 kg during the 2011 calendar year based on information submitted pursuant to section 71 of CEPA regarding commercial activity in Canada under Phase Two of the *Domestic Substances List* Inventory Update (DSL IU; Canada 2014). Thirty-nine polymers from the *Confidential Domestic Substances List* (CDSL) were included as part of the 336 polymers in this rapid screening. The identities of these polymers have been masked in this report to prevent the release of confidential business information, as required under section 88 of CEPA.

Polymers that meet the above criteria, but that have already been assessed and managed under CEPA, or are currently being addressed under other assessment activities, are not included in this report. Furthermore, assessments and conclusions

1 A determination of whether one or more of the criteria of section 64 are met is based upon an assessment of potential risks to the environment and/or to human health associated with exposures in the general environment. For humans, this includes, but is not limited to, exposures from ambient and indoor air, drinking water, foodstuffs, and the use of consumer products. A conclusion under CEPA is not relevant to, nor does it preclude, actions being taken under other sections of CEPA or other Acts.

2 As described in subsection 1(1) of the *New Substances Notification Regulations (Chemicals and Polymers)* (Canada 2005), "polymer" means a substance that consists of:
(a) molecules characterized by the sequence of one or more types of monomer units;
(b) greater than 50% by weight of molecules having three or more monomer units that are covalently bound to one or more other monomer units or reactants;
(c) less than 50% by weight of molecules of the same molecular weight; and
(d) molecules distributed over a range of molecular weights whose differences in molecular weights are primarily attributable to differences in the number of monomer units.

pertaining to some of the polymers in this polymer rapid screening may be subsequently updated as part of future assessments.

This assessment incorporates input from other programs within Environment and Climate Change Canada and Health Canada. Additionally, the draft of this Screening Assessment was subject to a 60-day public comment period. While external comments were taken into consideration, the final content and outcome of the screening assessment remain the responsibility of Health Canada and Environment and Climate Change Canada.

2. Approach

2.1. Ecological Component

The ecological component of the polymer rapid screening approach, as illustrated in Figure 1, consists of multiple steps that address different factors related to the potential for a substance to cause ecological harm. The approach is intended to be pragmatic, protective of the environment, and fairly rapid, largely making use of available or easily obtainable data.

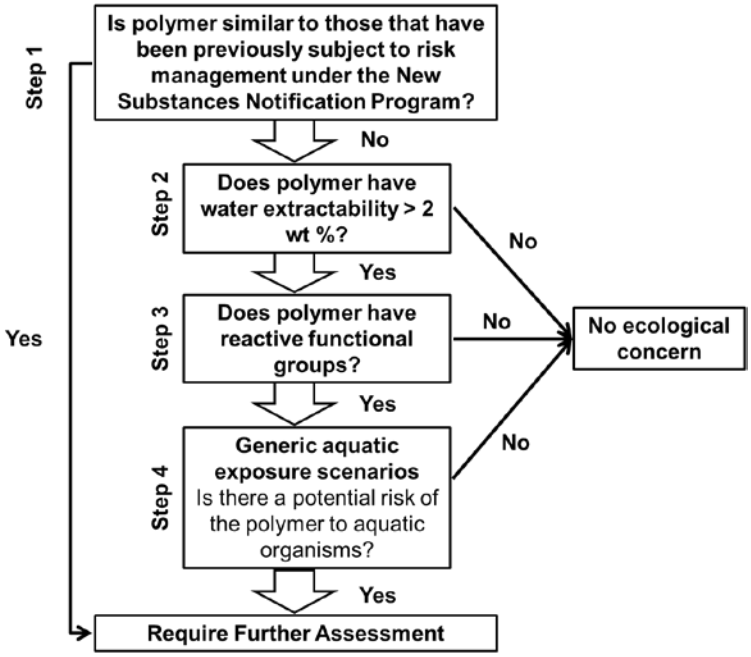

Figure 1: Overview of the ecological polymer rapid screening approach

Step 1: Identification of polymers similar to those that have been previously subject to risk management under the New Substance Notification Program.

Under the New Substances Notification (NSN) Program, there are numerous polymers that are subject to risk management measures. Polymers identified in this step have similar structural and/or chemical functional group(s) to those that have been previously risk managed and may have similar ecological concerns. Professional judgement was used to derive representative structures[3] based on chemical names and available monomer information. Judgement was also used to identify polymers that are structurally similar (e.g., by comparing chemical functionality) to those that have been

[3] Representative structures are used to predict the overall environmental behavior and properties of complex substances. Representative structures for polymers are developed using expert judgment based on the monomers and reactants listed in the substance name and knowledge of the reaction mechanism.

previously risk managed under the NSN Program. Substances identified at this step require further assessment and do not proceed to subsequent steps.

Step 2: Identification of polymers with water extractability greater than 2 % by weight.

The second step involves determining whether the polymer will likely have water extractability greater than 2 weight (wt) %. A water extractability greater than 2 wt % indicates that the polymer may be available to aquatic organisms. The increased potential for exposure to aquatic organisms may present higher ecological risk. This is consistent with the approach taken by the NSN Program, where polymers with less than or equal to 2 wt % water extractability are assumed to have low exposure potential towards aquatic organisms and new substances notifications are not required to include experimental ecotoxicity data.

Literature, MSDS databases, the New Substances database for polymers, and other reliable sources and databases (e.g. QSAR toolbox, ECHA chemical database) were searched for available water extractability and solubility information. For polymers where no information on water extractability could be found, professional judgement based on representative structures and chemical names was used to determine whether the substance could potentially be extracted into water. For example, 1,3-butadiene, 2-methyl-, homopolymer (CAS RN 9003-31-0) does not contain functional groups that are considered to increase water solubility, thus it would be expected to have water extractability less than 2 wt %. It is recognized that polymers identified by the same CAS RN may have different number average molecular weights and variable monomer composition, which may affect the water extractability of the polymers. A polymer is considered to have water extractability greater than 2 wt % if it contains functional group(s) that could potentially increase water extractability. In addition, polymers that are formulated in water and polymers that form a stable emulsion in water are considered to have water extractability greater than 2 wt %. These polymers will be considered further in Step 3.

Step 3: Identification of polymers with reactive functional groups.

The third step in the ecological component involves identifying polymers with reactive functional groups described under Schedule 7 (items 1 and 5) of NSNR (Chemicals and Polymers) (Canada 2005). According to these items, there are molecular weight limitations in which a functional group may be considered to be of concern. However, as there are no molecular weight data available for polymers, it is assumed that all polymers will have molecular weight below the cut off [i.e., number average molecular weight (Mn) less than 10,000 Daltons (Da), with greater than 25 wt % less than 1000 Da, and greater than 10 wt % less than 500 Da]. In addition, only functional groups present in the polymer are considered. Polymers without any reactive functional groups are expected to have low ecotoxicity; and therefore, are not of ecological concern.

Information regarding possible representative structures was not available from the DSL IU survey (Canada 2012). As such, representative structures were derived from information provided for similar substances under the NSN Program, Chemical Abstract Services (CAS) name, as well as professional knowledge on possible polymerization mechanisms. It is recognized that some polymers may have more than one possible polymerization mechanism, leading to several possible structures. In addition, the complexity of a multicomponent polymeric reaction would increase uncertainty regarding the presence of reactive functional groups in polymers. For these polymers, it is assumed that reactive functional groups are present and they are considered further in Step 4.

Step 4: Generic aquatic exposure scenarios.

The last step in the polymer rapid screening for ecological consideration involves applying different environmental release scenarios to estimate environmental exposure. Two generic aquatic exposure scenarios were applied (described hereafter as scenarios A and B) to identify potential concerns near the point of discharge of a substance into the environment. These scenarios involve comparing conservative (i.e., ecologically protective) estimates of exposure in receiving waters with an effects threshold in order to evaluate whether a polymer is likely to cause harm to the local aquatic environment. Figure 2 illustrates these exposure estimation approaches.

These approaches make use of available data from phase two of the DSL IU, including whether the substance was in commerce in Canada at greater than the reporting threshold of 1000 kg in 2011, as well as data from the NSN Program. As specific quantity information was not provided, the maximum quantity based on the reporting threshold for phase two of the DSL IU was used as a conservative assumption in the generic exposure scenarios.

Experimental ecotoxicity data were not available for any of the substances included in polymer rapid screening. In addition, since polymers can have number average molecular weights that exceed the reliability limit of available modelling software, modelling of ecotoxicity was not performed. Ecotoxicity values were derived from data endpoints available for various polymer types and species from the NSN Program (more than 1000 endpoints available). Based on these data, the lowest toxicity value reported for any polymer type and species was for algae with an acute EC_{50} of 0.016 mg/L. This value is assumed to represent the worst case toxicity for polymers that are considered under the polymer rapid screening approach, and was identified as the Critical Toxicity Value (CTV). A Predicted No Effect Concentration (PNEC) was derived by dividing the CTV by an assessment factor. An assessment factor of 10 was applied to the acute CTV of 0.016 mg/L to extrapolate from a severe short-term effect to long-term no-effects. Given the large number of species represented in the ecotoxicity dataset, no additional extrapolation assessment factor was applied to account for inter-/intra-species variation. Therefore, the PNEC was calculated as 1.6×10^{-3} mg/L.

While the generic aquatic exposure scenarios (A and B) have been developed to be conservative overall, the level of conservatism generally applied to individual parameters is moderate, since it is recognized that:

- a high level of conservatism applied to each parameter can easily compound into an excessively conservative overall exposure scenario;
- it is very unlikely that each parameter would be “worst case” at the same time; and
- the interdependency of some parameters exists.

Thus, values in keeping with an overall worst case scenario have been used.

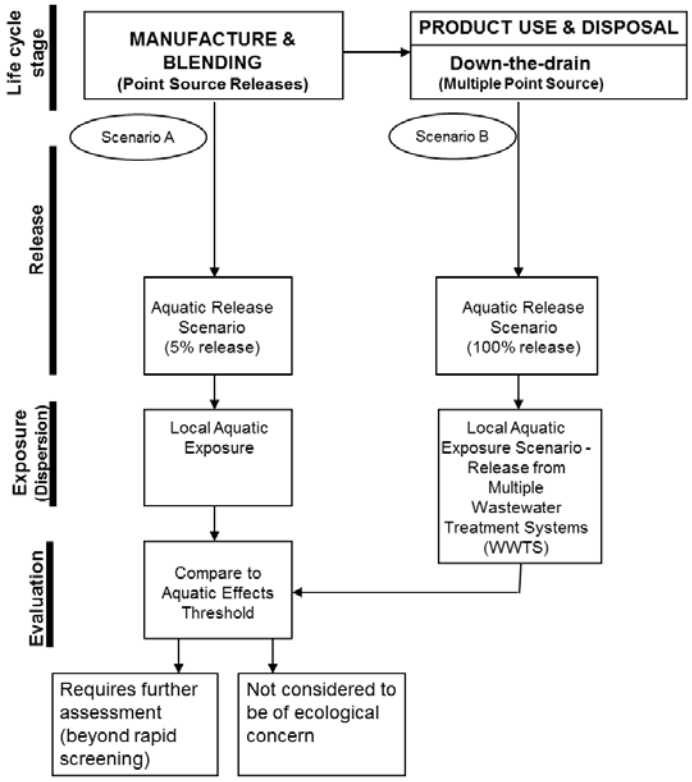

Figure 2: Overview of ecological exposure scenarios

Scenario A: Industrial point source aquatic release

Scenario A is based on release from an industrial facility that is manufacturing the substance and/or using it in the preparation of products. This scenario assumes the release of 5% of the substance from manufacturing and handling, based on conservative estimates for loss from cleaning of container residues (3%), transfer lines (1%) and process equipment (1%) (US EPA 1992). A conservative estimate of exposure [Predicted Environmental Concentration (PEC)] resulting from the release of the substance to the aquatic environment from such an industrial point source is calculated

as shown in the following equation. The aquatic PNEC is derived as shown in the equation below. Parameters used in Scenario A are described in Table 1.

Quantity released (kg/day) = [(Qty)(Release)(1 – Wastewater removal rate)]/duration

Flow rate (m^3/s) = River flow + Wastewater flow

PEC (mg/L) = [Quantity released / Flow rate](1000/86400)

Aquatic PNEC (mg/L) = CTV / AF

The PEC is then compared to the PNEC to determine a risk quotient (PEC / PNEC). If the risk quotient is greater than one, this indicates that the conservatively estimated concentration in water exceeds the aquatic estimated no-effect level and that there exists a potential to cause harm in the aquatic ecosystem. A value below one indicates that concentrations that may cause an effect to sensitive aquatic organisms are not reached; and therefore, harm to aquatic organisms is unlikely under this scenario.

Note that the wastewater treatment system (WWTS) removal efficiency for polymers varies significantly. However, removal efficiency typically depends on the Mn of the polymer as well as the charge on the polymer (Boethling and Nabholz 1997). For cationic, amphoteric and neutral polymers with Mn greater than 1000 Da, removal efficiency is typically assumed to be 90%. However, for polymers with Mn less than 1000 Da, the removal efficiency typically ranges between 50 and 90 %. For anionic polymers with Mn greater than 5000 Da, typical removal efficiency is greater than 50 %, and increases as molecular weight increases. For anionic polymers with Mn less than 5000 Da, typical removal efficiency ranges between 0 and 50 % (Boethling and Nabholz 1997). Considering that removal efficiency can vary significantly between different polymer types as well as varying Mn, a 50 % removal efficiency is assumed.

Table 1 - Parameters used in Scenario A

Abbreviation	Parameter	Value	Units	Notes
Qty	Maximum quantity of substance used at one facility	1000	kg	Maximum quantity based on reporting threshold under phase two DSL IU
Release	Release of substance during manufacturing or handling	5	%	Based on conservative estimates of release from cleaning of container residues (3%), transfer lines (1%) and reactors (1%)
Wastewater Removal	Wastewater Treatment System (WWTS) removal efficiency	50	%	Recognizing variability in removal efficiency for different types of polymers and varying Mn
Duration	Duration over which substance is released	150	days	Assumes seasonal use of substance
Wastewater flow	WWTS flow rate	0.04	m^3/s	10^{th} percentile of WWTS flow rates in Canada
River flow	Flow of receiving watercourse	1.84	m^3/s	15^{th} percentile of the distribution of receiving watercourse flows in the country (based on the distribution of the 50^{th} percentile of flow rates); weighted by number of industries releasing to the receiving watercourse
-	Factor combining conversion from kg to mg and m^3 to L	1000		
-	Conversion factor from days to seconds	86400		
CTV	Critical Toxicity Value	0.016	mg/L	Lowest acute aquatic toxicity from all available polymer data from NSN Program
AF	Application factor	10		To account for acute-to-chronic

Scenario B: Down-the-drain aquatic release from consumer products

The second scenario (residential releases to wastewater) considers the release of 100 % of the substance that is contained in a consumer product, from multiple point-sources (i.e., wastewater system discharges). Under this scenario, a value for the PEC from down-the-drain release of a substance contained in products is calculated, as well as a value for the aquatic PNEC, as defined in the equations below. Parameters used in Scenario B are described in Table 2 below.

Quantity released (kg/day) = [(Qty)(Release)(1 – Wastewater removal rate)(population)]/[(duration)(RPE)]

Flow rate (m^3/s) = River flow + Wastewater flow

PEC (mg/L) = [Quantity released / Flow rate](1000/86400)

Aquatic PNEC (mg/L) = CTV / AF

As was the case for Scenario A, the PEC and the PNEC are combined to determine a risk quotient (PEC / PNEC).

Note that river flow distributions used in the two scenarios are different. The likelihood of harm from industrial releases (Scenario A) is dependent on the number of industrial facilities releasing to a water body. In that scenario, a distribution of the dilution capacities of receiving waters (river flow) was generated with a weighting by the number of industrial facilities releasing to the water body. The likelihood of harm from down-the-drain release of consumer products (Scenario B) is dependent on the human population that may be releasing a substance to a WWTS. In this scenario, a distribution of the ratio of population of the community to the dilution capacity of the receiving water body was generated. As a result, the parameters “population”, “wastewater flow” and “river flow” are inter-connected. In this scenario, it is this ratio that is important, not the actual values of the population or flow rates.

Table 2 - Parameters used in Scenario B

Abbreviation	Parameter	Value	Units	Notes
Qty	Total quantity of substance used in Canada	1000	kg	Maximum quantity based on reporting threshold under phase two DSL IU
Release	Release of substance from product during use	100	%	Complete release for down-the-drain products assumed
Wastewater Removal	WWTS removal efficiency	50	%	Recognizing variability in removal efficiency for different types of polymer and varying Mn
Duration	Duration over which substance is released	150	days	Assuming seasonal use of substance
RPE	Regional product effect	2,000,000	persons	Value set to represent population of a Canadian region in which total quantity of product could be used
Wastewater flow	WWTS flow rate	0.66	m^3/s	The combined ratio of these three parameters corresponds to the 10^{th} percentile of the distribution of dilution capacity of a water body receiving WWTS effluent (river flow + WWTS flow) weighted by population served.
River Flow	Flow of receiving watercourse	3.58	m^3/s	See Wastewater flow description above
Population	Population of representative community	100,000	persons	See Wastewater flow description above
-	Factor combining conversion from kg to mg and m^3 to L	1000		
-	Conversion factor from days to seconds	86400		
CTV	Critical Toxicity Value	0.016	mg/L	Lowest acute aquatic toxicity from all available polymer data from NSN Program
AF	Application factor	10		To account for acute-to-chronic

There are two possible outcomes from Step 4:

- if the scenarios indicate a potential harmful effect to aquatic organisms, the substance is identified as requiring further assessment; or
- if the scenarios indicate a low likelihood of harm to aquatic organisms, then the substance is anticipated to present low ecological concern.

2.2. Human Health Component

A key element of the characterization of potential risk to human health is the determination of potential for exposure to the general population.

Given the reported quantities of candidate polymers in commerce in Canada (i.e., less than or equal to 1000 kg during the 2011 calendar year), exposure of the general population from environmental media such as air, water and soil (i.e., indirect exposure) is not expected to be significant. Release of a polymer to specific environmental media depends on factors such as location of release and the polymer's physical/chemical properties. Conservative modelling estimates using a fugacity-based model for applicable smaller molecule chemicals (ChemCan 2003) indicate that assuming 100 % release of a substance (i.e., the maximum possible release of 1000 kg) to either air, water or soil, potential exposures would be predicted to be less than 1 ng/kg bw/day. This finding is applicable to polymers as well since polymers are larger and commonly less available than smaller molecule chemicals; indirect exposure from environmental sources is not expected for polymers that are in commerce at low volumes.

Therefore, the process used to determine whether polymers warrant further assessment from a human health perspective within the rapid screening approach focuses initially on direct exposure and is illustrated in Figure 3.

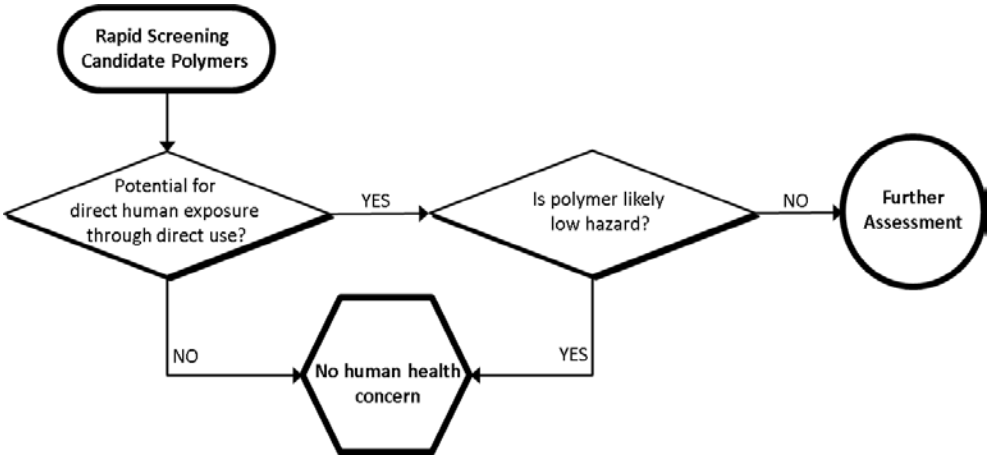

Figure 3: Overview of polymer rapid screening approach - human health considerations

Polymers reported to be in commerce in Canada at less than or equal to 1000 kg during the 2011 calendar year were considered to result in potential exposure to the general population if there was evidence of direct exposure (e.g., exposure from use of cosmetics). Otherwise, exposure of the general population is not expected and it can be concluded that the polymer is unlikely to cause harm to health at current levels of exposure.

Depending on the use of the polymer, direct exposure to the general population may be possible. Considerations for the determination of direct exposure potential are described below and outlined in Figure 4.

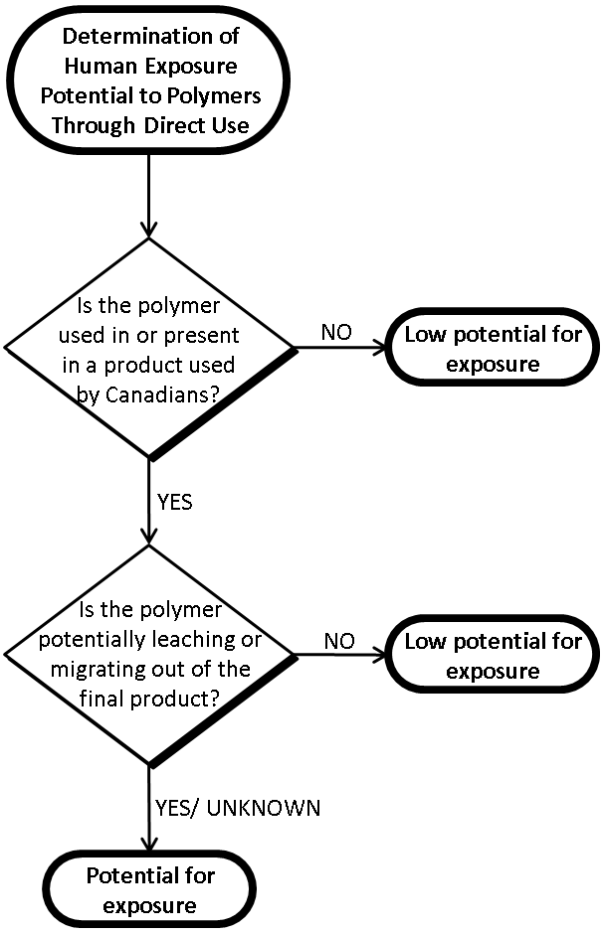

Figure 4: Considerations for the determination of direct human exposure potential to polymers through direct use.

The term “direct use” refers to the use of a polymer that is directly, or as part of a mixture, a product, or a manufactured item, sold to or made available to Canadians for their use.

"Direct use" does not include exposures from chemical products used by workers in an industrial setting or other workplace.

A user is considered to be anyone from the general public who has access to a product that is advertised, imported or sold in Canada[4].

To determine if a polymer is used in or present in a product used by Canadians, numerous sources of both domestic and international use and product information were consulted, including but not limited to:

Domestic

- Information from a mandatory CEPA section 71 survey under Phase Two of the DSL Inventory Update (Canada 2012)
- Health Canada's Lists of permitted food additives (2013)
- Health Canada's Natural Health Products Ingredients Database (NHPID 2015)
- Health Canada's Licensed Natural Health Products Database (LNHPD 2015)
- Health Canada's Drug Product Database (DPD 2014)
- Pest Management Regulatory Agency Product Information Database (PMRA 2014)
- Pest Management Regulatory Agency List of Formulants (PMRA 2010)
- List of Pharmaceuticals sold in Canada (2011 & 2012) (IMS 2013)
- Notifications submitted under the *Cosmetic Regulations* to Health Canada
- Notifications submitted under the *Food and Drugs Act* to Health Canada

International

- US EPA Chemical and Product Categories Database (CPCat 2014)
- Everything Added to Food in the United States Database (EAFUS 2011)
- US Food and Drug Administration's Food Additive Status List (US FDA 2013)
- US Food and Drug Administration's List of Indirect Additives used in Food Contact Substances (US FDA 2011)
- European Commission's Food Additive database (EU 2014a)
- European Commission's Food Flavourings database (EU 2014b)
- European Commission's Cosmetic Ingredient database (COSING 2014)
- Household Products Database (HPD 2014)
- Hazardous Substances Data Bank (HSDB c1993-2008)
- Danish Surveys on Chemicals in Consumer Products - various (Denmark 2014)
- Material Safety Data Sheets (MSDS) - various internet sources
- National and international assessments and databases

[4] http://www.hc-sc.gc.ca/cps-spc/pubs/indust/cccr-2001-rpccc/ref_man/index-eng.php#a1.1

Based on the information identified from these resources, the following considerations were used to determine potential for direct exposure:

1. Polymers for which direct exposures of the general population are not expected include, but are not limited to, polymers:
    a. used only as intermediates in the manufacturing process;
    b. used only for industrial use;
    c. used only for research purposes; or
    d. used only as pesticide formulants – In situations where the only use identified for a polymer was as a formulant in a pesticide product registered under the *Pest Control Products Act* (PCPA), this potential for direct exposure to the general public was not considered further in this screening assessment. Polymers in pest control products registered under the PCPA have undergone an ecological and human health risk assessment by the Pest Management Regulatory Agency (PMRA) according to the intended use and labelling as part of their registration process. The polymers used as formulants were considered separately from those identified as active ingredients in registered pesticide products, as the formulants, while components of pesticide products, do not provide a function(s) that is/are unique to pesticides.

2. Polymers with potential for direct exposure to the general population include those that are present, either intentionally or unintentionally, in products or manufactured items that are commonly used by Canadians. These include, but are not limited to, polymers used in:

    - products intended for use by children, and manufactured items such as plastic or wooden toys;
    - personal care products[5];
    - commercial paints and inks;
    - commercial adhesives,
    - hobby activities or do-it-yourself products; or
    - cleaning products.

3. Information on the potential for the polymer to migrate from products was also considered, including the type of product that the polymer is present in, and the polymer's functional use in that product. For example, direct exposure would not be expected to occur for a polymer used as a flame retardant in fluorescent light bulbs as any actual dermal contact with the product is minimal and the flame retardant polymer is encapsulated within the bulb. If this information is not known for a polymer, it was assumed that the polymer may be migrating out of the final product, which may lead to direct exposure for users.

[5] For the purpose of this document, a personal care product is defined as a polymer or mixture of polymers which is generally recognized by the public for use in daily cleansing or grooming. Depending on how the product is represented for sale and its composition, personal care products may fall into one of three regulatory categories in Canada: cosmetics, drugs or natural health products.

As indicated in Figure 3, polymers for which potential for direct exposure was identified were further screened against a set of criteria that are indicative of polymers likely posing a low hazard to human health. For a polymer to be considered as posing low hazard, the screening criteria include:

a) The polymer must not be classified as carcinogenic, mutagenic, toxic to reproduction (CMR);
b) The polymer must be either:
    i) a low concern polyester consisting only of monomers listed in Schedule 8 of the NSNR (Chemicals and Polymers); or
    ii) a polymer that contains functional groups considered to be non-reactive in biological settings;
c) The polymer can contain only the following:
    - Carbon, hydrogen, nitrogen, oxygen, silicon and sulphur;
    - Sodium, magnesium, aluminum, potassium, calcium, chlorine, bromine and iodine as the monoatomic counter-ions (Na^+, Mg^{2+}, Al^{3+}, K^+, Ca^{2+}, Cl^-, Br^- or I^-);
    - Fluorine, chlorine, bromine or iodine covalently bound to carbon; and
    - Less than 0.2 % (by weight) of any combination of the following atomic elements: lithium, boron, phosphorus, titanium, manganese, iron, nickel, copper, zinc, tin or zirconium;
d) The polymer must not be designed, or expected, to substantially degrade, decompose or depolymerize;
e) The polymer must not be water insoluble and high molecular weight if inhalation is a potential route of exposure—in the absence of data regarding physical/chemical properties and molecular weight, it is conservatively assumed that the polymer may be high molecular weight and water insoluble;
f) The polymer must not be water absorbing and high molecular weight if inhalation is a potential route of exposure—in the absence of data regarding physical/chemical properties and molecular weight, it is conservatively assumed that the polymer may be high molecular weight and water absorbing; and
g) The polymer must not be structurally similar to those that have been previously risk managed under the NSN Program for potential health concerns.

A polymer that poses potential for direct exposure and does not meet the above criteria for low hazard is considered to require further assessment. For polymers that pose potential for direct exposure yet are considered to be likely low hazard, it is concluded that these polymers are unlikely to cause harm to human health at current levels of exposure.

3. Screening Assessment Results

3.1. Assessment of Potential to Cause Ecological Harm

In this section, an overview of the results obtained at each step of polymer rapid screening for the substances covered under this assessment is provided. These results are summarized in Figure 5.

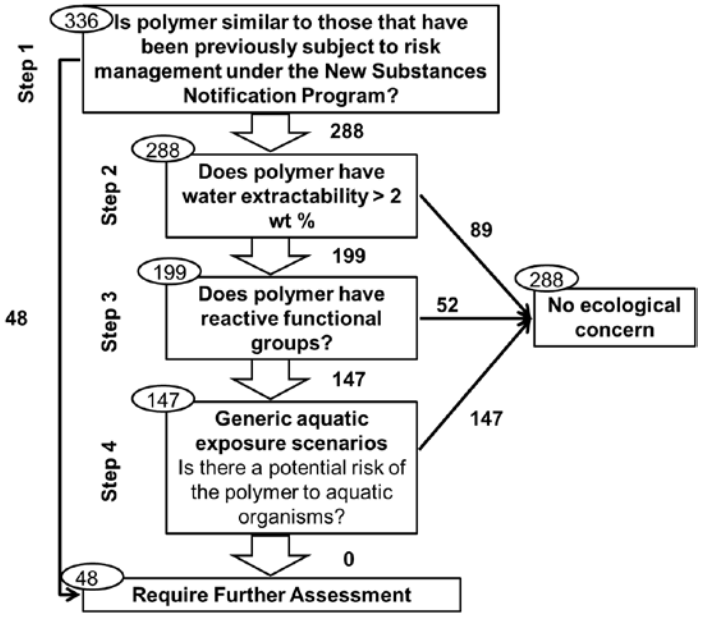

Figure 5: Summary of screening assessment results - ecological considerations

Step 1: Polymers similar to those that have been previously subject to risk management under the New Substances Notification Program.

Polymers that have been previously subject to risk management under the NSN Program can generally be divided into five classes including: surfactant type; cationic type; epoxy type; perfluorinated type; and siloxane type polymers. Based on comparison of name and possible structural features between low volume polymers and New Substances polymers, 48 were identified as having similar structural properties to one of the five classes of polymers identified above. Currently, these polymers may be in use at low quantities or are not in commerce; however, due to the similarities to the substances that have been subject to risk management by the NSN Program, it is concluded that they be considered further.

Step 2: Polymers with water extractability greater than 2 wt %.

Of the 288 polymers assessed in Step 2, 199 substances were identified as having water extractability potential greater than 2 wt %. These substances were further assessed in Step 3.

Step 3: Polymers with reactive functional groups.

Based on comparison of reactive functional groups and polymerization potential, as well as information available from the NSN Program, 147 of the 199 substances were considered to have the potential to contain one or more reactive functional groups, as listed under Schedule 7 (item 1 and 5) of the NSNR (Chemicals and Polymers) (Canada 2005).

Step 4: Generic aquatic scenarios

In this assessment, the quantity used in the exposure scenarios was 1000 kg per year, which was the reporting threshold for polymers under Phase Two of the DSL IU (Canada 2012). Both Scenario A (industrial point source aquatic release) and B (down-the-drain release from consumer products) were considered for 147 polymers.

Based on the industrial and consumer products release scenarios described above, as well as the conservative assumption of worst case ecotoxicity described in Section 2.1, all 147 low volume substances considered in Step 4 are not considered to be of ecological concern.

Summary of results from ecological assessment

In total, 48 of the substances evaluated using the ecological polymer rapid screening approach were identified as warranting further screening assessment from an ecological perspective. A list of these substances is provided in Appendix A. The other 288 substances were identified as posing a low risk of harm to organisms or the broader integrity of the environment at current levels of exposure.

3.2. Assessment of Potential to Cause Harm to Human Health

Of the 336 polymers examined from a human health perspective, six polymers were identified as having a use pattern that may lead to potential direct exposure of the general population, but they are considered to be low hazard. Exposure to the general population was not expected for another 312 polymers. Together these 318 polymers were identified as being unlikely to cause harm to human health at current levels of exposure.

The remaining 18 polymers were identified as having the potential to result in direct exposure to the general population and do not meet the criteria for low hazard;

therefore, these 18 polymers will be subject to further assessment. A list of these polymers requiring further assessment is provided in Appendix A.

4. Summary of Uncertainties

It is recognized that conclusions resulting from the use of this polymer rapid screening approach have associated uncertainties. However, the use of a wide range of information sources (relating to both exposure potential and hazard concerns identified for a polymer), as well as the use of conservative exposure scenarios increases confidence in the overall approach that polymers identified as not requiring further assessment are unlikely to be of concern.

Uncertainties associated with the ecological assessment include the assumptions made to derive representative structures, potential presence of reactive functional groups, monomer composition, number average molecular weight, water extractability, and aquatic toxicities. It is also recognized that polymers covered under the same CAS RN may have significantly different number average molecular weights and monomer composition; and hence, a range of physical-chemical properties and hazard. However, conservative assumptions were made for these polymers based on professional judgment. In addition, a worst case toxicity based on toxicity data from the NSN Program was selected for risk quotient determination.

5. Conclusion

In total, from both ecological and human health assessments, 61 of the 336 polymers were identified as requiring further assessment (Appendix A).

Based on the information available, it is concluded that the remaining 275 polymers (Appendix B) are not entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity, that constitute or may constitute a danger to the environment on which life depends, or that constitute or may constitute a danger in Canada to human life or health. It is therefore concluded that the 275 polymers listed in Appendix B do not meet any of the criteria set out in section 64 of CEPA.

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Appendix A: Polymers identified as requiring further assessment

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]	Potential Ecological Concern	Potential Human Health Concern
25067-00-9	Benzenesulfonamide, 4-methyl-, polymer with formaldehyde and 1,3,5-triazine-2,4,6-triamine		X
25568-39-2	2-Propenoic acid, 2-methyl-, 2-(dimethylamino)ethyl ester, polymer with 2-propenamide	X	
26006-22-4	Ethanaminium, N,N,N-trimethyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]-, methyl sulfate, polymer with 2-propenamide	X	X
26811-08-5	Formaldehyde, polymer with 5,5-dimethyl-2,4-imidazolidinedione		X
27083-27-8	Guanidine, N,N'''-1,6-hexanediylbis[N'-cyano-, polymer with 1,6-hexanediamine, hydrochloride		X
27103-90-8	Ethanaminium, N,N,N-trimethyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]-, methyl sulfate, homopolymer	X	X
29320-38-5	Ethane, 1,2-dichloro-, polymer with ammonia	X	X
31132-30-6	2-Propenoic acid, polymer with N-[(dimethylamino)methyl]-2-propenamide and 2-propenamide	X	
31346-57-3	2-Propenoic acid, 2-methyl-, butyl ester, polymer with 2-(dimethylamino)ethyl 2-methyl-2-propenoate, dodecyl 2-methyl-2-propenoate and octadecyl 2-methyl-2-propenoate	X	
31568-35-1	Methanamine, polymer with (chloromethyl)oxirane	X	
33434-24-1	Ethanaminium, N,N,N-trimethyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]-, chloride, polymer with ethyl 2-propenoate and methyl 2-methyl-2-propenoate	X	X
36657-47-3	2-Propenoic acid, 2-methyl-, 2-	X	

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]	Potential Ecological Concern	Potential Human Health Concern
	(dimethylamino)ethyl ester, polymer with dodecyl 2-methyl-2-propenoate and methyl 2-methyl-2-propenoate		
41222-47-3	2-Propenamide, N-[(dimethylamino)methyl]-, polymer with 2-propenamide	X	
52285-95-7	Ethanaminium, N,N,N-trimethyl-2-[(1-oxo-2-propenyl)oxy]-, methyl sulfate, polymer with 2-propenamide	X	
55185-45-0	Formaldehyde, polymer with ammonia, 2-methylphenol and phenol		X
55295-98-2	Guanidine, cyano-, polymer with ammonium chloride ((NH4)Cl) and formaldehyde		X
56372-23-7	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(tridecafluorohexyl)sulfonyl]amino]ethyl]-ω-hydroxy-	X	
64755-04-0	Naphthenic acids, reaction products with polyethylenepolyamines	X	
65086-64-8	2-Propenoic acid, 2-methyl-, 2-(diethylamino)ethyl ester, polymer with ethenylbenzene and tridecyl 2-methyl-2-propenoate	X	
66037-36-3	1,3-Propanediamine, N,N-dimethyl-, polymer with (chloromethyl)oxirane, sulfate	X	
67762-97-4	Siloxanes and Silicones, ethoxy Me		X
67846-33-7	2-Propenoic acid, 2-methyl-, polymer with N,N'-bis(2-aminoethyl)-1,2-ethanediamine, (chloromethyl)oxirane, 4,4'-(1-methylethylidene)bis[phenol] and (Z)-N-9-octadecenyl-1,3-propanediamine	X	
67953-62-2	2-Propenoic acid, 2-methyl-, 2-(dimethylamino)ethyl ester, polymer with 2-ethylhexyl 2-propenoate, ethyl 2-propenoate and 2-propenamide	X	
67953-80-4	2-Propenamide, polymer with formaldehyde and N-methylmethanamine	X	
68003-04-3	Ethanol, 2-amino-, compd. with α-(2-cyanoethyl)-ω-(4-	X	

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]	Potential Ecological Concern	Potential Human Health Concern
	nonylsulfophenoxy)poly(oxy-1,2-ethanediyl) (1:1)		
68036-99-7	Oxirane, (chloromethyl)-, polymer with ammonia, reaction products with chloromethane	X	
68071-95-4	Quaternary ammonium compounds, ethylbis(hydroxyethyl)tallow alkyl, ethoxylated, Et sulfates (salts)		X
68155-82-8	Ethane, 1,2-dichloro-, polymer with ammonia, monohydrochloride	X	
68258-80-0	2-Propenoic acid, 2-methyl-, 2-(1-aziridinyl)ethyl ester, polymer with methyl 2-methyl-2-propenoate and 2-methylpropyl 2-methyl-2-propenoate	X	
68298-80-6	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(undecafluoropentyl)sulfonyl]amino]ethyl]-ω-hydroxy-	X	
68298-81-7	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-ω-hydroxy-	X	
68318-41-2	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with N-(2-aminoethyl)-1,2-ethanediamine, (butoxymethyl)oxirane and (chloromethyl)oxirane	X	
68439-72-5	Amines, C8-18 and C18-unsatd. alkyl, ethoxylated		X
68459-31-4	Fatty acids, C9-11-branched, glycidyl esters, polymers with castor oil, formaldehyde, 6-phenyl-1,3,5-triazine-2,4-diamine and phthalic anhydride		X
68512-03-8	Methanamine, N,N-dimethyl-, reaction products with (chloromethyl)ethenylbenzene-divinylbenzene polymer and sodium hydroxide	X	
68584-77-0	1,3-Propanediamine, N-(3-aminopropyl)-, polymer with (chloromethyl)oxirane and α-hydro-ω-hydroxypoly(oxy-1,2-ethanediyl), reaction products with laurylamine		X

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]	Potential Ecological Concern	Potential Human Health Concern
68585-07-9	Octadecanoic acid, 12-hydroxy-, polymer with butyl 2-methyl-2-propenoate, ethenylbenzene, 2-ethylhexyl 2-propenoate, 2-hydroxyethyl 2-propenoate, 2-methyl-2-propenoic acid and oxiranylmethyl 2-methyl-2-propenoate, 1-aziridineethanol-terminated	X	
68648-57-7	Rosin, polymer with phenol and tall-oil rosin		X
68951-93-9	Siloxanes and Silicones, di-Me, di-Ph, hydroxy-terminated		X
68958-60-1	Poly(oxy-1,2-ethanediyl), α-[2-[ethyl[(pentadecafluoroheptyl)sulfonyl]amino]ethyl]-ω-methoxy-	X	
70750-20-8	2-Propenamide, homopolymer, reaction products with chloromethane, dimethylamine and formaldehyde	X	
71832-81-0	Benzenesulfonic acid, hydroxy-, monosodium salt, polymer with formaldehyde and 4,4'-sulfonylbis[phenol]		X
72496-95-8	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane, N,N-dimethyl-1,3-propanediamine and tetradecyloxirane	X	
72845-42-2	Ethanol, 2-amino-, compd. with α-(2-cyanoethyl)-ω-(nonylsulfophenoxy)poly(oxy-1,2-ethanediyl) (1:1)	X	
80044-11-7	Oxirane, (chloromethyl)-, polymer with ammonia, hydrochloride	X	
85434-86-2	2-Propenamide, polymer with (chloromethyl)oxirane, methanamine and N,N,N',N'-tetramethyl-1,2-ethanediamine	X	
86706-87-8	1,3-Propanediaminium, 2-hydroxy-N,N,N,N',N'-pentamethyl-N'-[3-[(2-methyl-1-oxo-2-propenyl)amino]propyl]-, dichloride, homopolymer	X	

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]	Potential Ecological Concern	Potential Human Health Concern
101060-97-3	Ethanaminium, N,N,N-trimethyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]-, chloride, polymer with 2-propenamide and N,N,N-trimethyl-2-[(1-oxo-2-propenyl)oxy]ethanaminium chloride	X	
105839-18-7	Fatty acids, C16 and C18-unsatd., polymers with bisphenol A, Bu glycidyl ether, epichlorohydrin and triethylenetetramine	X	
111850-23-8	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane, reaction products with 2,2,4(or 2,4,4)-trimethyl-1,6-hexanediamine	X	X
129698-94-8	2-Propenoic acid, 2-methyl-, 2-(diethylamino)ethyl ester, polymer with 2-methylpropyl 2-methyl-2-propenoate	X	
139682-51-2	Fatty acids, C18-unsatd., dimers, polymers with bisphenol A, diethylenetriamine, epichlorohydrin, tall-oil fatty acids and triethylenetetramine	X	
191616-99-6	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with chloromethyl)oxirane, reaction products with 5-amino-1,3,3-trimethylcyclohexanemethanamine and 2,2,4(or 2,4,4)-trimethyl-1,6-hexanediamine	X	
11497-4[b]	α-Fluoro-ω-[2-[(1-oxo-2-propenyl)oxy]ethyl]poly(difluromethylene), polymer with 2-methyl-2-propenoic acid phenylmethyl ester, (Z)-2-butenedioic acid bis(2-ethylhexyl) ester and 2-methyl-2-propenoic acid 2-(heteromonocycle) ethyl ester	X	
11504-2[b]	α-Fluoro-ω -[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl]poly(difluoro-methylene), polymer with 2-methyl-2-propenoic acid 1,1-dimethylethyl ester and 2-methyl-2-propenoic acid 2-(heteromonocycle)ethyl ester	X	

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]	Potential Ecological Concern	Potential Human Health Concern
11498-5[b]	α-Fluoro-ω -[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl]poly(difluoromethylene), polymer with 2-methyl-2-propenoic acid octadecyl ester and 2-methyl-2-propenoic acid 2-(heteromonocycle)ethyl ester	X	
11487-3[b]	Fatty acids, tall-oil, reaction products with monomethyl maleate and a polyethylenepolyamine	X	
11482-7[b]	Formaldehyde, reaction product with phenol, polybutene derivs., polyethylene polyamines with alkenoic acid	X	
11483-8[b]	Formaldehyde, reaction product with phenol, polybutene derivs., polyethylene polyamines, alkenoic acid and metallo acid	X	
11200-4[b]	Substituted acrylate of a dimethyl, alkyl, substituted carbomonocycle, ammonium chloride derivative	X	
11496-3[b]	N,N' 2-Tris(6-isocyanatohexyl)imidodicarbonic diamide, α-fluoro-ω -(2-hydroxyethyl)poly(difluoromethylene), heteromonocycle-methanol and 1-octadecanol adduct	X	

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[c] Masked names are allowed by CEPA if the publication of the explicit chemical or biological name of a substance would result in the release of confidential business information.

Appendix B: Polymers identified as not meeting criteria under Section 64 of CEPA

CAS RN[a] or Confidential Accession Number[b]	**Substance Name[c]**
9003-37-6	Butanal, polymer with benzenamine
9003-50-3	Heptanal, polymer with benzenamine

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]
9005-12-3	Poly[oxy(methylphenylsilylene)]
9008-63-3	Naphthalenesulfonic acid, sodium salt, polymer with formaldehyde
9016-83-5	Formaldehyde, polymer with methylphenol
9017-72-5	Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-sulfonylbis[phenol]
9022-96-2	1-Butanol, titanium(4+) salt, homopolymer
9060-53-1	2,5-Furandione, dihydro-3-(tetrapropenyl)-, polymer with 1-amino-2-propanol and 1,2-ethanediol
9086-40-2	Formaldehyde, polymer with (1,1,3,3-tetramethylbutyl)phenol
12624-35-0	9,12-Octadecadienoic acid (*Z*,*Z*)-, dimer, polymer with 1,2-ethanediamine
24937-74-4	Formaldehyde, polymer with benzenamine and phenol
24969-10-6	Oxirane, (chloromethyl)-, polymer with oxirane
25014-31-7	Benzene, (1-methylethenyl)-, homopolymer
25035-68-1	2-Propenoic acid, 2-methyl-, polymer with ethenylbenzene and ethyl 2-propenoate
25035-90-9	2-Butenedioic acid (*Z*)-, dibutyl ester, polymer with ethenyl acetate
25053-96-7	Formaldehyde, polymer with 2-methylphenol
25085-17-0	1,2-Ethanediamine, *N*-(2-aminoethyl)-, polymer with (chloromethyl)oxirane
25155-81-1	Formaldehyde, polymer with methylbenzene
25766-18-1	Bicyclo[3.1.1]hept-2-ene, 2,6,6-trimethyl-, homopolymer
25951-19-3	2-Propenoic acid, 2-methyl-, dodecyl ester, polymer with 5-ethenyl-2-methylpyridine and octadecyl 2-methyl-2-propenoate
26338-45-4	Aziridine, homopolymer, hydrochloride
26338-61-4	2-Furancarboxaldehyde, polymer with phenol
26591-12-8	Guanidine, cyano-, polymer with formaldehyde
26617-87-8	Oxirane, methyl-, polymer with oxirane, compd. with iodine
27553-53-3	Formaldehyde, polymer with 4-(1,1-dimethylpropyl)phenol
27754-94-5	1,2-Ethanediamine, *N*,*N*'-bis(2-aminoethyl)-, polymer with (chloromethyl)oxirane
28472-87-9	Guanidine, cyano-, polymer with formaldehyde and 1,3,5-triazine-2,4,6-triamine
29086-67-7	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with oxirane
30584-00-0	Formaldehyde, polymer with *N*-(3-aminopropyl)-1,3-propanediamine and 1,3,5-triazine-2,4,6-triamine
30705-14-7	Benzenesulfonamide, 2-methyl-, polymer with formaldehyde, 4-methylbenzenesulfonamide and 1,3,5-triazine-2,4,6-triamine
32311-19-6	Urea, polymer with formaldehyde and 1,3,5,7-tetraazatricyclo[3.3.1.13,7]decane
32761-96-9	Benzenediazonium, 2-methoxy-4-(phenylamino)-, salt with 2,4,6-trimethylbenzenesulfonic acid (1:1) polymer with 1,1'-oxybis[4-(methoxymethyl)benzene]
32844-27-2	Carbonic dichloride, polymer with 4,4'-(1-methylethylidene)bis[2,6-dibromophenol] and 4,4'-(1-methylethylidene)bis[phenol]

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]
34323-39-2	Oxirane, (chloromethyl)-, polymer with ammonium hydroxide ($(NH_4)(OH)$)
34802-28-3	Formaldehyde, polymer with benzenamine, methyloxirane, oxirane and phenol
35297-54-2	Formaldehyde, polymer with ammonia and phenol
37189-83-6	9,12-Octadecadienoic acid (*Z*,*Z*)-, dimer, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine
37238-34-9	Formaldehyde, polymer with nonylphenol and phenol
37281-91-7	Lignin, polymer with formaldehyde and phenol
37337-65-8	Formaldehyde, polymer with phenol and 1,3,5,7-tetraazatricyclo[3.3.1.13,7]decane
37604-36-7	Formaldehyde, polymer with phenol and 4-(1,1,3,3-tetramethylbutyl)phenol
37625-74-4	Urea, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine, *N*,*N*'-bis(2-aminoethyl)-1,2-ethanediamine and formaldehyde
37625-93-7	2-Propenoic acid, polymer with (chloromethyl)oxirane and 4,4'-(1-methylethylidene)bis[phenol]
40364-42-9	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane and 4,4'-methylenebis[benzenamine]
52108-93-7[d]	Lignin, ammonium salt
53740-05-9	Dextrin, polymer with formaldehyde
61472-52-4	Urea, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine and formaldehyde
61827-83-6	Lignosulfonic acid, copper salt
62073-57-8	Urea, *N*,*N*'-bis(hydroxymethyl)-, polymer with formaldehyde and (hydroxymethyl)urea
63494-85-9	Formaldehyde, polymer with 4-methyl-2-nonylphenol and 4-methylphenol
63512-71-0	Formaldehyde, polymer with ammonia and chloroethane
63784-89-4	Benzenesulfonic acid, 4-amino-, monosodium salt, polymer with formaldehyde and methylphenol
63951-50-8	Naphthalenesulfonic acid, sodium salt, polymer with formaldehyde and 4,4'-sulfonylbis[phenol]
65733-73-5	Formaldehyde, polymer with 4,4'-(1-methylethylidene)bis[phenol] and 4-(1,1-dimethylpropyl)phenol
65733-79-1	Phenol, polymer with 1-methyl-4-(1-methylethenyl)cyclohexene and 2,6,6-trimethylbicyclo[3.1.1]hept-2-ene
65733-82-6	Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol, 4,4'-(1-methylethylidene)bis[phenol] and 4-(1,1,3,3-tetramethylbutyl)phenol
65997-11-7	Rosin, fumarated, polymer with pentaerythritol
67763-03-5	Silsesquioxanes, Me Ph
67784-93-4	Formaldehyde, polymer with 2-methylphenol and phenol, sulfonated, sodium salt
67784-97-8	Naphthalenesulfonic acids, polymers with formaldehyde and sulfonated phenol, sodium salts
67786-28-1	2-Naphthalenesulfonic acid, 6-hydroxy-, polymer with formaldehyde, 3-methylphenol and 4-methylphenol, sodium salt

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]
67816-01-7	Propanoic acid, 3-hydroxy-2-(hydroxymethyl)-2-methyl-, polymer with 1,4-cyclohexanedimethanol, 1,3-diisocyanatomethylbenzene, hydrazine and α-hydro-ω-hydroxypoly(oxy-1,4-butanediyl)
67846-45-1	1,3-Propanediamine, *N*-9-octadecenyl-, (*Z*)-, polymer with (chloromethyl)oxirane and α-hydro-ω-hydroxypoly(oxy-1,2-ethanediyl)
67905-95-7	Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol and 4-nonylphenol
67924-33-8	Ethanol, 2,2',2''-nitrilotris-, homopolymer, hydrochloride
67953-56-4	1,6-Hexanediamine, *N*-(6-aminohexyl)-, polymer with (chloromethyl)oxirane
67953-82-6	Phenol, 4-dodecyl-, polymer with 1,2-ethanediamine and formaldehyde, compd. with (dibutylamino)methanol
67970-32-5	Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol and methylphenol
68003-26-9	Formaldehyde, polymer with ammonia and 2-methylphenol
68015-68-9	Poly(oxy-1,2-ethanediyl), α-hydro-ω-hydroxy-, ether with 1-[[2-[[2-[bis(2-hydroxyethyl)amino]ethyl](2-hydroxyethyl)amino]ethyl](2-hydroxyethyl)amino]-3-(9-octadecenyloxy)-2-propanol (4:1), (*Z*)-
68036-98-6	Imidazo[4,5-d]imidazole-2,5(1*H*,3*H*)-dione, tetrahydro-, polymer with formaldehyde, butylated
68037-87-6	Siloxanes and Silicones, Me vinyl
68072-45-7	1,4-Pentadien-3-one, 1,5-bis[4-(oxiranylmethoxy)phenyl]-, polymer with 4,4'-(1-methylethylidene)bis[2,6-dibromophenol] and 4,4'-(1-methylethylidene)bis[phenol]
68082-23-5	Cyclosiloxanes, Me vinyl
68082-91-7	Rosin, fumarated, polymer with formaldehyde, potassium sodium salt
68082-95-1	Rosin, maleated, polymer with bisphenol A, formaldehyde, glycerol and pentaerythritol
68083-27-2	Soybean oil, polymer with ethylenediamine, linoleic acid dimer, pentaerythritol, phthalic anhydride and tall oil
68123-23-9	Nonanedioic acid, polymer with 1,2-ethanediamine, 1,6-hexanediamine and (*Z*,*Z*)-9,12-octadecadienoic acid dimer
68130-98-3	Aziridine, homopolymer, ethoxylated, phosphonomethylated
68134-00-9	Decanedioic acid, polymer with 1,2-ethanediamine, 1,6-hexanediamine and (*Z*,*Z*)-9,12-octadecadienoic acid dimer
68140-39-6	Formaldehyde, polymer with (chloromethyl)oxirane, 4,4'-(1-methylethylidene)bis[phenol], methyloxirane, methyloxirane polymer with oxirane ether with 1,2,3-propanetriol (3:1), nonylphenol and oxirane
68152-47-6	Rosin, fumarated, polymer with bisphenol A, formaldehyde and pentaerythritol
68152-60-3	Rosin, maleated, polymer with bisphenol A, formaldehyde and glycerol
68152-67-0	Rosin, maleated, polymer with tripentaerythritol
68152-68-1	Rosin, polymer with bisphenol A and formaldehyde
68154-31-4	Fatty acids, C_{14-18}, ethoxylated propoxylated
68155-33-9	Amines, C_{14-18}-alkyl, ethoxylated
68155-40-8	Amines, C_{16-18} and C_{18}-unsatd. alkyl, ethoxylated
68188-28-3	Tall-oil rosin, maleated, polymer with pentaerythritol
68188-63-6	Rosin, maleated, polymer with bisphenol A and formaldehyde

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68188-92-1	Amines, tallow alkyl, propoxylated
68201-58-1	Rosin, fumarated, polymer with formaldehyde
68213-26-3	Amines, tallow alkyl, ethoxylated propoxylated
68213-35-4	Fatty acids, C_{18}-unsatd., dimers, polymers with ethylenediamine, 4-hydroxy-γ-(4-hydroxyphenyl)-γ-methylbenzenebutanoic acid and oleic acid
68240-07-3	Phenol, polymer with 6,6-dimethyl-2-methylenebicyclo[3.1.1]heptane and 2,6,6-trimethylbicyclo[3.1.1]hept-2-ene
68240-08-4	Phenol, polymer with 3-methylene-6-(1-methylethyl)cyclohexene, 1-methyl-4-(1-methylethenyl)cyclohexene, 1-methyl-4-(1-methylethyl)-1,3-cyclohexadiene, 1-methyl-4-(1-methylethyl)-1,4-cyclohexadiene, 2-methyl-5-(1-methylethyl)-1,3-cyclohexadiene, 1-methyl-4-(1-methylethylidene)cyclohexene and 2,6,6-trimethylbicyclo[3.1.1]hept-2-ene
68310-21-4	Poly(oxy-1,2-ethanediyl), α-hydro-ω-hydroxy-, ether with α-[[(2-hydroxyethyl)[2-[[2-[(2-hydroxyethyl)octadecylamino]ethyl](2-hydroxy-2-phenylethyl)amino]ethyl]amino]methyl]benzenemethanol (2:1)
68332-89-8	Aziridine, homopolymer, propoxylated, benzyl chloride-quaternized
68333-40-4	Tung oil, polymer with boron trifluoride-phenol complex, formaldehyde, phenol, β-pinene and turpentine oil
68333-98-2[d]	Coconut oil, ester with polyethylene glycol mono(nonylphenyl) ether
68379-09-9	Benzenesulfonamide, ar-methyl-, polymer with formaldehyde and tetrahydroimidazo[4,5-d]imidazole-2,5(1*H*,3*H*)-dione
68390-20-5	Fatty acids, sunflower-oil, polymers with adipic acid, caprolactam, diethylenetriamine and triethylenetetramine
68400-14-6	Guanidine, cyano-, polymer with 1,2-ethanediamine sulfate (1:1) and formaldehyde
68410-22-0[d]	Fatty acids, C_{18}-unsatd., dimers, reaction products with diethylenetriamine
68412-14-6	Octadecanoic acid, reaction products with 2-[(2-aminoethyl)amino]ethanol and urea
68440-73-3	Siloxanes and Silicones, di-Me, Me Ph, hydroxy-terminated
68441-69-0	1,2-Ethanediamine, polymer with 1,3-diisocyanatomethylbenzene, reaction products with oleylamine
68479-80-1	Phenol, polymer with 1,2-cyclohexanediamine, formaldehyde and 1,6-hexanediamine
68511-76-2	2,5-Furandione, polymer with formaldehyde and 1,3,5-triazine-2,4,6-triamine, butylated isopropylated, reaction products with triethylamine
68512-34-5[d]	Lignosulfonic acid, sodium salt, sulfomethylated
68513-37-1	Fatty acids, tall-oil, polymers with diethylenetriamine and linoleic acid dimers
68513-38-2	Fatty acids, tall-oil, polymers with diethylenetriamine, linoleic acid dimers and triethylenetetramine
68516-42-7	2-Propenoic acid, 2-methyl-, 2-[(1,1-dimethylethyl)amino]ethyl ester, polymer with methyl 2-methyl-2-propenoate and 2-methylpropyl 2-methyl-2-propenoate
68516-43-8	2-Propenoic acid, 2-methyl-, polymer with 2-methylaziridine, methyl 2-methyl-2-propenoate and 2-methylpropyl 2-methyl-2-propenoate
68516-87-0	Benzenesulfonic acid, 2,4-dimethyl-, polymer with formaldehyde and 4,4'-sulfonylbis[phenol], ammonium sodium salt

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68527-87-7	Formaldehyde, polymer with 2-ethoxyethanol and phenol
68540-48-7	9,12-Octadecadienoic acid (*Z*,*Z*)-, dimer, compd. with *N*,*N*'-bis(2-aminoethyl)-1,2-ethanediamine
68540-71-6	Benzoic acid, 2-hydroxy-, polymer with formaldehyde, 2-methylphenol and nonylphenol
68541-21-9	9,12-Octadecadienoic acid (*Z*,*Z*)-, polymer with (chloromethyl)oxirane and 4,4'-(1-methylethylidene)bis[phenol]
68541-77-5	Decanedioic acid, polymer with 2-aminoethanol, 1,2-ethanediamine and (*Z*,*Z*)-9,12-octadecadienoic acid dimer
68552-99-8	Fatty acids, vegetable-oil, polymers with phthalic anhydride and rosin
68553-78-6	Oils, oiticica, polymers with boron trifluoride-phenol complex, formaldehyde, phenol, β-pinene and turpentine oil
68554-18-7	Rosin, fumarated, polymer with glycerol, ammonium salt
68604-06-8	Castor oil, hydrogenated, polymer with ethylenediamine, 12-hydroxyoctadecanoic acid and sebacic acid
68605-92-5	Fatty acids, tall-oil, reaction products with polyethylenepolyamines, compds. with polyethylene glycol decyl ether phosphate
68606-78-0	Naphthenic acids, esters with polytriethanolamine
68609-24-5	Formaldehyde, polymer with benzenamine, propoxylated
68610-07-1	Formaldehyde, polymers with isobutylenated phenol
68610-55-9	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane and phenyloxirane, reaction products with 4,4'-methylenebis[benzenamine]
68610-75-3	2-Propenoic acid, 2-methyl-, methyl ester, polymer with 2-mercaptoethanol, reaction products with ammonia and *N*,*N*',2-tris(6-isocyanatohexyl)imidodicarbonic diamide
68650-48-6	Fatty acids, C_{18}-unsatd., dimers, polymers with C_{18}-unsatd. alkyl amine dimers and ethylenediamine
68890-97-1	Aziridine, homopolymer, compd. with (chloromethyl)benzene
68891-01-0	Benzenesulfonamide, ar-methyl-, polymer with formaldehyde and 1,3,5-triazine-2,4,6-triamine, butylated
68910-67-8	Rosin, fumarated maleated, polymer with formaldehyde, potassium sodium salt
68915-81-1	Linseed oil, polymer with bisphenol A, bisphenol A diglycidyl ether, diethylenetriamine, formaldehyde, glycidyl Ph ether and pentaethylenehexamine
68920-24-1	Fatty acids, dehydrated castor-oil, polymers with bisphenol A, epichlorohydrin, fumaric acid and rosin
68920-41-2	Fatty acids, tall-oil, reaction products with polyethylenepolyamines, compds. with polyethylene glycol monooctyl ether phosphate
68937-31-5	4,6,10-Dodecatrien-3-one, 7,11-dimethyl-, cyclized, by-products from, fractionation residues
68951-99-5	Siloxanes and Silicones, di-Me, Me vinyl, mono(vinyl group)-terminated
68952-00-1	Siloxanes and Silicones, di-Me, mono(vinyl group)-terminated
68953-74-2	Aziridine, homopolymer, ethoxylated, phosphonomethylated, sodium salt
68956-65-0	Naphthenic acids, polymers with ethylenimine, compds. with linoleic acid dimer

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68988-41-0	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane, reaction products with diethanolamine and polyethylene glycol monooleate
68988-81-8	Hexanedioic acid, polymer with bis(2-chloroethyl) (1-hydroxyethyl)phosphonate, 2-chloroethyl hydrogen (2-chloroethyl)phosphonate, 2-chloroethyl hydrogen (1-hydroxyethyl)phosphonate, (*E*)-2,3-dibromo-2-butene-1,4-diol, 1,3-diisocyanatomethylbenzene and 2,2'-oxybis[ethanol], reaction products with diethanolamine, hydrochlorides
68988-82-9	Hexanedioic acid, polymer with bis(2-chloroethyl) (1-hydroxyethyl)phosphonate, 2-chloroethyl hydrogen (2-chloroethyl)phosphonate, 2-chloroethyl hydrogen (1-hydroxyethyl)phosphonate, (*E*)-2,3-dibromo-2-butene-1,4-diol, 1,3-diisocyanatomethylbenzene and 1,2-propanediol, reaction products with diethanolamine, hydrochlorides
68989-80-0	Fatty acids, linseed-oil, polymers with glycerol, maleic anhydride, phthalic anhydride, rosin and tung oil
69011-21-8	Benzene, diethenyl-, polymer with ethenylbenzene and ethenylethylbenzene, sulfonated, ammonium salts
69178-40-1	Formaldehyde, polymer with benzenamine and 2-ethylbenzenamine
69898-35-7	Urea, polymer with formaldehyde and 1,3,5,7-tetraazatricyclo[3.3.1.13,7]decane, butylated
69898-36-8	Urea, polymer with formaldehyde and 1,3,5,7-tetraazatricyclo[3.3.1.13,7]decane, butylated ethylated
69929-35-7	Decanedioic acid, polymer with 1,2-ethanediamine, (*Z*,*Z*)-9,12-octadecadienoic acid dimer and 4,4'-(1,3-propanediyl)bis[piperidine]
69929-44-8	9,12-Octadecadienoic acid (*Z*,*Z*)-, dimer, polymer with 5-amino-1,3,3-trimethylcyclohexanemethanamine and 1,2-ethanediamine, acetate
70528-79-9	Sulfite liquors and Cooking liquors, spent, polymer with formaldehyde
70693-20-8	Cyanamide, reaction products with carbon dioxide, ethylene oxide and 1-octadecanamine
70750-07-1	Formaldehyde, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine, benzylated
70851-21-7	Siloxanes and Silicones, di-Me, (C_{3-33}-alkyloxy)-terminated
71042-85-8	2-Propenoic acid, 2-methyl-, telomer with 2-[(1,1-dimethylethyl)amino]ethyl 2-methyl-2-propenoate, 1-dodecanethiol, methyl 2-methyl-2-propenoate and exo-1,7,7-trimethylbicyclo[2.2.1]hept-2-yl 2-methyl-2-propenoate
71077-22-0	Benzoic acid, 2-hydroxy-, polymer with formaldehyde, 4-nonylphenol and zinc oxide (ZnO)
71412-29-8	2-Propenoic acid, 2-methyl-, 2-hydroxyethyl ester, telomer with *tert*-dodecanethiol, ethenylbenzene, isodecyl 2-methyl-2-propenoate and 2-propenoic acid, compd. with 2-(dimethylamino)ethanol
72121-75-6	Formaldehyde, polymer with 2,2'-iminobis[ethanol], 4,4'-(1-methylethylidene)bis[phenol], nonylphenol and 1,3,5-triazine-2,4,6-triamine
72207-55-7	Benzenamine, ethylenated, distn. residues
72361-56-9	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 5-amino-1,3,3-trimethylcyclohexanemethanamine, (butoxymethyl)oxirane and (chloromethyl)oxirane
72828-15-0	Benzene, diethenyl-, polymer with ethenylbenzene, sulfonated, ammonium salts

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72968-37-7	Amines, C_{12-18}-alkyl, ethoxylated
73049-34-0	Alcohols, C_{16-20}, ethoxylated propoxylated
73297-33-3	Poly(oxy-1,2-ethanediyl), α-[tris[1-(methylphenyl)ethyl]phenyl]-ω-hydroxy-
75790-74-8	1,2,3-Propanetriol, polymer with 1,3-diisocyanatomethylbenzene, hydrazine, methyloxirane and oxirane
76649-36-0	Formic acid, compd. with *N*-(2-aminoethyl)-1,2-ethanediamine polymer with formaldehyde and urea
76649-37-1	Hexanedioic acid, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine, ammonia, (chloromethyl)oxirane, formaldehyde and formic acid, formate hydrochloride sulfate
76649-45-1	Hexanedioic acid, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine, (chloromethyl)oxirane, formaldehyde and formic acid
76649-46-2	Hexanedioic acid, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine, (chloromethyl)oxirane, formaldehyde and formic acid, formate hydrochloride sulfate
76822-95-2	Imides, cyclic, from C_{15-20} α-alkene-maleic anhydride copolymer and (*Z*)-*N*-9-octadecenyl-1,3-propanediamine
79770-99-3	Fatty acids, C_{18}-unsatd., dimers, distn. lights, reaction products with α,α'-(1-methyl-1,3-propanediyl)bis[ω-hydroxypoly(oxy-1,2-ethanediyl)]
82640-14-0	Naphthalenesulfonic acids, polymers with formaldehyde, sulfonated 1,1'-oxybis[methylbenzene] and sulfonylbis[phenol], ammonium sodium salts
89394-61-6	Formaldehyde, polymer with *N*-(2-aminoethyl)-*N*'-[2-[(2-aminoethyl)amino]ethyl]-1,2-ethanediamine and benzenamine
95012-79-6	Tetraglycerol, monododecyl ether
95649-04-0	Naphthalenesulfonic acids, polymers with formaldehyde, sulfonated 1,1'-biphenyl and sulfonylbis[phenol], ammonium sodium salts
95649-08-4	Formaldehyde, polymers with sulfonated terphenyl and sulfonylbis[phenol], ammonium sodium salts
96591-18-3	Fatty acids, tall-oil, reaction products with 2-amino-2-(hydroxymethyl)-1,3-propanediol and formaldehyde, polymers with acrylonitrile, Et acrylate and Me methacrylate
96591-23-0	Formaldehyde, polymers with sulfonated 1,1'-biphenyl, sulfonated terphenyl and sulfonylbis[phenol], ammonium sodium salts
97969-64-7	Propanoic acid, 3-hydroxy-2-(hydroxymethyl)-2-methyl-, polymer with 1-aziridineethanol, formaldehyde, 1,6-hexanediol and 1,3,5-triazine-2,4,6-triamine
98654-27-4	Fatty acids, dehydrated castor-oil, polymers with dehydrated castor oil, 2-(dimethylamino)ethanol, isononanoic acid, isophthalic acid, linseed oil, maleic anhydride and pentaerythritol
100588-10-1	2-Propenoic acid, polymer with 2,2'-[1,2-ethanediylbis(oxymethylene)]bis[oxirane] and sodium 2-propenoate
102082-95-1	2-Propenoic acid, ammonium salt, polymer with 2-propenamide and 2-propenenitrile
102561-59-1	Hexanedioic acid, polymer with *N*-(2-aminoethyl)-1,3-propanediamine and *N*,*N*''-1,2-ethanediylbis[1,3-propanediamine]
102984-13-4	2-Propenoic acid, sodium salt, polymer with 2,2'-[1,2-

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	ethanediylbis(oxymethylene)]bis[oxirane]
103458-43-1	2-Propenoic acid, polymer with 2-(diethylamino)ethyl 2-propenoate and 2-propenamide, sulfate
104376-66-1	Formaldehyde, polymers with branched nonylphenol, ethylene oxide and hexamethylenediamine
106214-62-4	Fatty acids, soya, polymers with adipic acid, 1,6-hexanediol, 3-hydroxy-2-(hydroxymethyl)-2-methylpropanoic acid, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane, isophthalic acid and trimethylolpropane, compds. with triethylamine
106214-63-5	Fatty acids, soya, polymers with benzoic acid, 3-hydroxy-2-(hydroxymethyl)-2-methylpropanoic acid, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane, isophthalic acid, pentaerythritol and phthalic anhydride, compds. with triethylamine
108563-09-3	Amines, tallow alkyl, ethoxylated, 4-dodecylbenzenesulfonates (salts)
110392-46-6	Formaldehyde, reaction products with 1,4-benzenediol and *m*-phenylenediamine, sulfurized
110720-55-3	Oxirane, methyl-, polymer with oxirane, ether with [[3-[(2-hydroxymethylethyl)amino]propyl]imino]bis[propanol] (3:1), *N*-tallow alkyl derivs., sulfates (esters), ammonium salts
112484-41-0	Formaldehyde, polymer with 4-(1,1,3,3-tetramethylbutyl)phenol, hydrobromic acid-terminated
115559-71-2	Sulfurous acid, monosodium salt, reaction products with *m*-cresol-formaldehyde-nonylphenol polymer
115559-72-3	Sulfurous acid, monosodium salt, reaction products with *m*-cresol-formaldehyde polymer
116265-69-1	Formaldehyde, reaction products with hexamethylenediamine and oxidized ethylene-propene polymer
117985-54-3	Benzenesulfonic acid, hydroxy-, monosodium salt, polymer with benzenamine, formaldehyde, 1,3,5-triazine-2,4,6-triamine and urea, bisulfited
118460-96-1	Formaldehyde, polymer with methylphenol, nonylphenol and phenol, bisulfited
118685-17-9	Benzenesulfonic acid, 4-amino-, polymer with formaldehyde, 2-methylphenol and phenol, bisulfited
119147-80-7	Octadecanoic acid, 12-hydroxy-, homopolymer, 2-hydroxy-3-[(2-methyl-1-oxo-2-propenyl)oxy]propyl ester, polymer with methyl 2-methyl-2-propenoate and oxiranylmethyl 2-methyl-2-propenoate, 2-methyl-2-propenoate 4-nitrobenzoate
121028-89-5	2-Propenoic acid, 2-methyl-, telomer with butyl 2-methyl-2-propenoate, 1-dodecanethiol, 2-mercaptoethanol, methyl 2-methyl-2-propenoate and 2-(3-oxazolidinyl)ethyl 2-methyl-2-propenoate
121053-40-5	Amines, *N*-coco alkyltrimethylenedi-, compds. with acrylic acid-*N*-(butoxymethyl)-2-propenamide-Et acrylate-styrene polymer and 2-(dimethylamino)ethanol
121053-44-9	Pentanedioic acid, dimethyl ester, polymer with *N*-(2-aminoethyl)-1,2-ethanediamine, ammonia and (chloromethyl)oxirane
121053-47-2	Propanoic acid, 2-hydroxy-, compd. with (chloromethyl)oxirane polymer with 2-

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	(methylamino)ethanol, 4,4'-(1-methylethylidene)bis[phenol] and α,α'-[(1-methylethylidene)di-4,1-phenylene]bis[ω-hydroxypoly(oxy-1,2-ethanediyl)]
121372-53-0	2-Propenoic acid, 2-methyl-, methyl ester, telomer with butyl 2-propenoate, tert-dodecanethiol, ethenylbenzene, 2-(methylamino)ethanol and oxiranylmethyl 2-methyl-2-propenoate, (±)-2-hydroxypropanoate (salt) (*S*)-2-hydroxypropanoate (salt)
121375-94-8	Urea, polymer with benzenamine, formaldehyde and 1,3,5-triazine-2,4,6-triamine, bisulfited
121617-09-2	Alcohols, C_{16-18}, propoxylated
121617-10-5	Rosin, polymd., polymer with maleic anhydride, phthalic anhydride, tall oil, tetrahydroabietyl alc. and trimethylolpropane
122966-99-8	Phenol, 2,4,6-tris(1-methylpropyl)-, reaction products with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane], ethoxylated
123774-67-4	Formaldehyde, polymer with ammonium hydroxide ($(NH_4)(OH)$), 4-(1,1-dimethylethyl)phenol and phenol
124578-08-1	1,3-Butadiene, 2-chloro-, homopolymer, reaction products with zinc oxide
125249-27-6	Formaldehyde, polymer with methanol and nonylphenol
125302-07-0	2-Propenamide, polymer with formaldehyde and morpholine
125302-08-1	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-iminobis[ethanol], 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane] and 4-nonylphenol
125328-35-0	Amides, from hydrogenated tallow and tetraethylenepentamine, polymers with epichlorohydrin and polyethylene glycol, acetates (salts)
125328-72-5	2-Propenoic acid, 2-methyl-, methyl ester, telomer with butyl 2-propenoate, tert-dodecanediol, ethenylbenzene, 2-(methylamino)ethanol, oxiranylmethyl 2-methyl-2-propenoate and 1,2-propanediol
125329-08-0	9-Octadecenoic acid (*Z*)-, polymer with copper(2+) sulfate (1:1), 2,5-furandione and oxybis[propanol]
125351-98-6	Aziridine, homopolymer, reaction products with epichlorohydrin and polyethylene glycol, acetates
125352-08-1	Amines, *N*-C_{12-22}-alkyltrimethylenedi-, ethoxylated
125352-10-5	Sulfuric acid copper(2+) salt (1:1), polymer with 2,5-furandione and oxybis[propanol]
125378-97-4	2-Propenoic acid, butyl ester, polymer with ethenylbenzene, methyl 2-methyl-2-propenoate, oxiranylmethyl 2-methyl-2-propenoate, 1,2-propanediol mono(2-methyl-2-propenoate) and 2,2'-thiobis[ethanol]
125826-31-5	1,2-Benzenedicarboxylic acid, di-2-propenyl ester, polymer with (*Z*)-butyl hydrogen 2-butenedioate, butyl 2-methyl-2-propenoate, ethenylbenzene, 2-ethylhexyl 2-propenoate, 2-hydroxyethyl 2-methyl-2-propenoate, 12-hydroxyoctadecanoic acid homopolymer 2-hydroxy-3-[(2-methyl-1-oxo-2-propenyl)oxy]propyl ester, methyl 2-methyl-2-propenoate, 2-methyl-2-propenoic acid and oxiranylmethyl 2-methyl-2-propenoate, 4-nitrobenzoate
125826-39-3	Propanoic acid, 3-hydroxy-2-(hydroxymethyl)-2-methyl-, polymer with 1,4-cyclohexanedimethanol, 1,3-diisocyanatomethylbenzene, hydrazine and α-hydro-ω-hydroxypoly(oxy-1,4-butanediyl), compd. with *N*,*N*-diethylethanamine
128801-08-1	Formaldehyde, polymer with 4,4'-(1-methylethylidene)bis[phenol], 2,2'-[(1-

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	methylethylidene)bis(4,1-phenyleneoxymethylene)bis[oxirane] and phenol
128971-25-5	Fatty acids, polymers with isophthalic acid, linoleic acid dimer and triethylenetetramine
129126-83-6	Linseed oil, polymer with benzoic acid, formaldehyde, pentaerythritol, phenol, phthalic anhydride, rosin, TDI, 3a,4,7,7a-tetrahydro-1,3-isobenzofurandione and trimethylolpropane
129126-87-0	Linseed oil, polymer with benzoic acid, formaldehyde, pentaerythritol, phenol, phthalic anhydride, rosin, TDI, 3a,4,7,7a-tetrahydro-1,3-isobenzofurandione and trimethylolpropane, compds. with 2-(dimethylamino)ethanol
129420-90-2	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-iminobis[ethanol] and 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]
129783-27-3	Guanidine, cyano-, polymer with formaldehyde and 1,3,5-triazine-2,4,6-triamine, sulfonated, sodium salts
129783-43-3	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-iminobis[ethanol] and 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane], reaction products with polyethylene glycol monostearate
129783-50-2	Benzenesulfonamide, 4-amino-, polymer with (chloromethyl)oxirane, 4,4'-(1-methylethylidene)bis[2,6-dibromophenol] and 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]
129870-85-5	Hexanedioic acid, polymer with 1,3-isobenzofurandione, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethylcyclohexane and oxybis[propanol], 2-hydroxyethyl acrylate-blocked
144030-98-8	Benzenesulfonic acid, 4-hydroxy-, polymer with formaldehyde and urea, reaction products with aniline, 1,3-bis(hydroxymethyl)urea, 4,5-dihydroxy-1,3-bis(hydroxymethyl)-2-imidazolidinone, disodium disulfite, formaldehyde, tetrahydro-3,5-bis(hydroxymethyl)-1
144031-00-5	Propanoic acid, 2-hydroxy-, compds. with bisphenol A-epichlorohydrin-polyethylene glycol ether with bisphenol A (2:1) polymer-2-(methylamino)ethanol reaction products
144238-33-5	2-Propenoic acid, 2-methyl-, reaction products with bisphenol A-bisphenol A diglycidyl ether polymer benzoate and styrene
147170-42-1	2-Propenoic acid, telomer with 1-dodecanethiol, S-oxides, ammonium salts
150226-40-7	Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol, 4,4'-(1-methylethylidene)bis[phenol] and 4-methylphenol, magnesium oxide complex
150226-41-8	Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol and 4,4'-(1-methylethylidene)bis[phenol], magnesium oxide complex
154862-02-9	Rosin, polymd., polymer with maleic anhydride, phthalic anhydride, tall oil, tetrahydroabietyl alc. and trimethylolethane
155240-18-9	Benzenesulfonic acid, dodecyl-, reaction products with succinic anhydride monopolyisobutylene derivs., tetraethylenepentamine and zinc oxide
160611-46-1	2,5-Furandione, telomer with ethenylbenzene and (1-methylethyl)benzene, C_8-rich C_{7-9}-isoalkyl esters
165307-61-9	1,3-Isobenzofurandione, polymer with 2,2-bis(hydroxymethyl)-1,3-propanediol and 1,2,3-propanetriol, benzoate (9*Z*,12*Z*)-9,12-octadecadienoate
176227-30-8	Formaldehyde, polymer with 4-(1,1-dimethylethyl)phenol and oxirane, esters

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]
	with tall-oil fatty acids
10008-0[b]	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane] and diethanolamine and poly(oxyalkylenediyl), α-(1-oxo-9-octadecenyl)-ω-hydroxy-, (*Z*)-
10009-1[b]	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane] and bis(2-substituted ethyl) amine
10011-3[b]	Cyanoguanidine polymer with diammonium sulfate and an alkyl aldehyde
10017-0[b]	Amido amine composed of 1,3-propanediamine, *N*-(3-aminoalkyl)-*N*-methyl and fatty acids, C_{18}-unsaturated dimers
10697-5[b]	Metal alkenylsuccinate
10709-8[b]	Piperazine, 1,2-alkyldiamine, formaldehyde and (chloromethyl)oxirane, polymer
11048-5[b]	Fatty acids, tall-oil, reaction products with polyethylene glycol, and dicarboxylic acid, salt with reaction products of fatty acids, tall-oil and polyalkylenepolyamine
11054-2[b]	Nonyl phenol, ethoxylated, monoester with dicarboxylic acid, neutralized with reaction products of tall-oil fatty acids and polyalkylenepolyamine
11065-4[b]	Fatty acids, tall oil, reaction product with polyalkyenepolyamine and phosphoric acid
11108-2[b]	Phosphoric acid, polysubstituted amino resin, amino substituted borate
11111-5[b]	Amino amide composed of 1,4-piperazinedialkylamine and fatty acids, C_{18}-unsatd. dimers
11114-8[b]	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane] and diethanolamine and poly(oxyalkylenediyl), α.-oxooctadecyl)-ω-hydrox-
11118-3[b]	Phenol, 4,4'-(1-methylethylidene)bis-, polymer with chloromethyl)oxirane, 1,3,5-triazine-2,4,6-triamine polymer with formaldehyde, and substituted benzoic acid, 1-propanol, 2-(dimethylamino)-2-methyl-, salt
11126-2[b]	Substituted bis disubstituted heteropolycycle, polymer with (chloromethyl)oxirane, dihydro-2,5-furandione and 4,4'-(1-methylethylidene) bis[phenol], alkanoate, 2-propenoate, metal salt
11135-2[b]	Tall oil rosin, polymer with alkanoic acid, disubstituted heteropolycyclic acid and 1,3-propanediol, 2-ethyl-2-(hydroxymethyl)-
11147-5[b]	Polymer of aromatic acids, tall oil fatty acid, polyols, *N*,*N*-dimethylethanolamine, methanol, melamine and formaldehyde
11154-3[b]	Polymer of linseed oil, pentaerythritol, isophthalic acid, monobasic acid, rosin, and maleic anhydride

CAS RN[a] or Confidential Accession Number[b]	Substance Name[c]
11176-7[b]	Fatty acids, C_{18}-unsaturated, dimers, polymers with tall-oil fatty acids and tetraethylenepentamine, reaction products with bisphenol A-epichlorhydrin condensate and polyalkylenepolyamines
11201-5[b]	Polymer of linseed and chinawood oils and synthetic rosin, pentaerythritol and solid resin
11431-1[b]	Poly(allyl methacrylate/butyl acrylate/2-substituted ethyl acrylate/methacrylic acid/methyl methacrylate) 2-amino-2-methyl-1-propanol salt
11436-6[b]	Reaction product of alkenylsarcosine, polyoxypropylenediamine and zinc stearate
11459-2[b]	Naphtha (petroleum), light steam cracked, debenzenised, polymer with alkylphenol and formaldehyde
11461-4[b]	Rosin, maleated, polymer with a carbonyl compound and pentaerythritol, calcium, magnesium and zinc salts
11470-4[b]	Rosin, polymer with *p-tert*-butylphenol, formaldehyde, glycerol and an alkylphenol
11471-5[b]	Rosin, polymer with an alkylphenol, bisphenol A, formaldehyde and glycerol
11472-6[b]	Rosin, maleated, polymer with a carbonyl compound, calcium, magnesium and zinc salts
11475-0[b]	Fatty acids, polymerized, reaction products with diethylenetriamine and tall-oil fatty acids
11512-1[b]	Phenol, 4,4'-(methylethylidene)bis-, polymer with (chloromethyl)oxirane, methyloxirane, and combined [oxy(methyl-1,2-ethanediyl)]
11513-2[b]	Reaction product of alkylphenol, formaldehyde, monoethanolamine, ethylene oxide and propylene oxide
11588-5[b]	Reaction product of: (4,4'-(1-methylethylidene)bisphenol polymer with substituted methyl(oxirane) and 5-amino-1,3,3 trimethyl cyclohexane methanamine and *N*,*N*-bis(aminoethyl)-1,2-ethanediamine
11589-6[b]	Reaction product of: 4,4'-(1-Methyethylidene)bisphenol polymer with substituted methyl(oxirane) and 5-amino-1,3,3-trimethyl cyclohexane methanamine and 2,2,4 (or 2,4,4)trimethyl-1,6-hexanediamine

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[c] Masked names are allowed by CEPA if the publication of the explicit chemical or biological name of a substance would result in the release of confidential business information.
[d] These substances were not identified under subsection 73(1) of CEPA but were included in this assessment as they were considered as priorities based on other human health concerns.