



EcoLogo Standard Development: Background Note Pool and Spa Chemical [Water Treatment](#) Products



On August 13th, 2009, the EcoLogo™ Program circulated a discussion document for public consultation. Stakeholders, who play a pivotal role in the EcoLogo standard development process, provided valuable feedback to help the Program as it develops an environmental leadership standard for Pool and Spa Water Treatment Products. EcoLogo public consultations are open to anyone in the public and strive to involve environmental NGOs and other not-for-profit organizations, academics and other scientific experts, manufacturers, industry associations, government representatives, and purchasing professionals.

This Background Note is designed to convey the standard development process, clarify the rationale for establishing criteria and illustrate how stakeholder feedback was incorporated throughout the process to arrive at a proposed EcoLogo draft standard for Pool and Spa Water Treatment Products. It is important to mention that while every effort has been made to acknowledge and act upon all comments provided by stakeholders, the Program must uphold its premier mandate; balance stakeholder views while establishing an environmental leadership standard, which is roughly defined as the top 20 percent of products/services available in the market at the time of the development or revision of a standard with the lowest environmental impacts across all stages of the life cycle.

This Background Note is presented in association with a first draft standard (see [Draft 1-CCD-171](#)) which is proposed and currently subject to a public stakeholder consultation. This stakeholder consultation will be open for 45 days beginning December 4, 2009. All comments must be received by Monday, January 18, 2010. For your convenience, the EcoLogo Program will accept comments by e-mail, fax, or phone.

Your time and input is very much appreciated; stakeholder comments are essential to the development of the most stringent environmental standards. We will send you a reminder as our closing date for comments approaches.

Sincerely,
The EcoLogo Program
Attn: Pool and Spa Water Treatment Products
Email: rduchesneau@ecologo.org
Toll Free: 1.800.478.0399 ext: 239
Fax: 613.247.2228

Table of Contents

1 Introduction.....	3
2 Scope and Category Definitions	3
3 Background.....	5
3.1 Activities of Other Eco-Labels	5
4 Environmental Considerations and Proposed Criteria Statements	6
4.1 Preliminary Research	6
4.1.1. Category 1 – Water Sanitizers	6
4.1.2. Category 2 – Algaecides.....	9
4.1.3. Category 3 – Water Balancers : pH Increasers	13
4.1.4. Category 4 – Water Balancers: pH Decreasers.....	14
4.1.5. Category 5 – Clarifying/Flocculent Agents	16
4.1.6. Category 6 – Metal Sequestering Agents	18
4.1.7. Category 7 – Phosphate Removers.....	20
4.1.8. Category 8 – Water Conditioners	22
4.2 Prohibited and Restricted Substances.....	24
4.3 Health Hazards.....	25
4.4 Environmental Hazards.....	26
4.5 Energy, Water, and Waste	28
4.6 Packaging	29
4.7 Performance	30
4.8 Labelling Requirements and Conditions for EcoLogo Use	30
4.8.1. Product Information on Labels	30
4.8.2. Environmental Claims Labelling	31
5 Additional Questions.....	32
6 References.....	34

1 Introduction

On August 13th, 2009, the EcoLogo Program circulated a discussion document for public consultation. Stakeholders provided valuable feedback to help the Program as it develops an environmental leadership standard for Pool and Spa ~~Chemical~~ Water Treatment Products.

This Background Note is designed to convey the standard development process; clarify the rationale for establishing criteria, and illustrates how stakeholder feedback was incorporated throughout the process to arrive at a proposed EcoLogo draft standard for Pool and Spa ~~Chemical~~ Water Treatment Products. It also builds on a previously published Discussion Document that was circulated to stakeholder to gain preliminary feedback. Here, in most occasions, the original text found in the Discussion Document has been restated in regular font, new additional text is formatted in blue underlined and proposed deletions from the original Discussion Document formatted in ~~strike through~~. Stakeholder comments were added in "blue italic underline with quotation marks". In some occasions, to reduce the length of the document, some of the original text was simply deleted.

Several questions were raised in the Discussion Document. Stakeholders provided answers to some of the questions, however some questions remained unanswered. Seven stakeholders actively participated and provided approximately 44 comments (as seen below in the various sections). Out of these seven stakeholders, six represented pool and spa product manufacturers and one the general interest category.

2 Scope and Category Definitions

At first glance, the product category for *Pool and Spa* ~~Chemical~~ Water Treatment Products is vast. The scope of this standard has been established to encompass both the biobased and chemical products used to maintain above and below ground conventional residential pool and residential spas. ~~More specifically, the scope is limited to chemically treated swimming pools and spas, and their associated maintenance chemical products which are added directly to pool and spa water.~~

Subcategories for this standard represent the chemical products used to maintain a chemically treated residential pool and residential spa. The EcoLogo Program suggests that these be limited to products which are added directly to swimming pool water. The subcategories preliminarily identified include: water sanitizers, algaecides, balancers, clarifying agents, metal sequestering agents, phosphate removers and water conditioners. EcoLogo currently has another active criteria document that speaks to hard surface cleaners

(i.e. [CCD-146](#)) and intends to propose its use for around-the-pool maintenance chemical products.

Rationale: It is the intention of the EcoLogo Program to restrict the standard's scope to the above categories for several reasons. Limiting the scope to residential pools and spas was decided in light of the fact that there is an increasing prevalence of these types of recreational facilities across North America. There are approximately 7.6 million backyard pools in the United States and 650 000 in Canada. Despite an increasing awareness of alternative residential pool and spa disinfection mechanisms (such as electric oxidation, salt chlorination, ozone, mineral sanitation systems, etc.), the EcoLogo Program is restricting the scope of this standard to [biologically and](#) chemically treated pools and spas because they continue to be the most prevalent type used [in the residential market](#). The alternative systems often involve the installation of a new technological unit; as such, we classified them as pool and spa technologies as opposed to biological or chemical products. Although the proposed scope does not address technologies, should their use continue to increase, EcoLogo will consider their inclusion during the standard's first review period (~3 years post initial standard development).

Q1) Do you believe that the scope and associated subcategories are reasonable? Why?

[The majority of stakeholders disagreed with the proposed scope and categories and proposed several modifications. The main comments related to Q1 were:](#)

["...the very important subcategory is missing oxidation which should include chlorine "shock" products and potassium monopersulfate "oxidizing shock" products..."](#)

["...we have some concerns with possibly certifying chlorine base sanitizers and various metal/petro chemical algaecides when they don't even comply with Canadian Water Discharge Bylaws..."](#)

["...there are two challenges; conflict with some existing programs and investment required to develop and operate this program is probably far larger than the residential pool market and probably even the commercial pool market could support..."](#)

[Proposed Scope](#)

[Following the initial discussion with stakeholders, the EcoLogo Program has decided to include the following subcategories in the proposed standard:](#)

- [CCD-171A – oxidizers;](#)
- [CCD-171B – algaecides;](#)
- [CCD-171C – balancers \(pH increasers, pH decreasers, or alkalinity increasers\)](#)
- [CCD 171D – enhancers \(clarifying agents, flocculants, metal sequesters, or conditioners\); and](#)

- [CCD 171E – phosphate removers](#)

[It should be noted that while water sanitizers such as chlorine – and bromine – based chemicals are often needed to efficiently treat pool and spa water, they are not included in this standard. Due to their toxicity, these chemicals are regulated by governments, and because they dominate the current marketplace, the EcoLogo Program does not feel they should be included in an environmental leadership standard that strives to identify the top 20 percent of products/services available in the market, which have the lowest environmental impacts across all stages of the life cycle.](#)

3 Background

3.1 Activities of Other Eco-Labels

To our knowledge no [environmental leadership](#) standard or eco-label exists for this product category. [However, stakeholders made us aware of two pertinent standards:](#)

- [ANSI/APSP-11- 2009 “American National Standard for Water Quality in Public Pools and Spas”;](#)
- [NSF/ANSI Standard 60: “Drinking Water Treatment Chemicals – Health Effects”.](#)

[“... ANSI/APSP-11- 2009 “American National Standard for Water Quality in Public Pools and Spas” standard, is a first-of-its-kind standard for the recreational water industry. Not only does ANSI/APSP-11 provide succinct guidance for pool operators and health officials, it also gives a detailed, scientific rationale based on available data or best practices...”](#)

[“...some US States also require pool treatment chemicals to be certified to NSF/ANSI Standard 60: Drinking Water Treatment Chemicals – Health Effects. This standard establishes evaluation criteria for chemicals added directly to drinking water and sets maximum use levels for these chemicals based on human ingestion toxicology data. This standard does not address the dermal, inhalation or olfactory effects of chemicals. If criteria were developed in the EcoLogo standard for the health effects of pool treatment chemicals, it may be useful to simply reference the NSF 60 standard for the ingestion health effects. Developing the evaluation program for the dermal, inhalation and olfactory safety aspects would certainly be very useful, but the investment cost would probably be quite large and might not be able to be supported by this industry...”](#)

4 Environmental Considerations and Proposed Criteria Statements

4.1 Preliminary Research

4.1.1. Category 1 – Water Sanitizers

When dealing with swimming pool water sanitizers it would appear that “chlorine” type products dominate the market and “bromine” type dominate for spas. Chlorine has been the choice sanitization product for “*nine out of ten residential pools in the U.S.*”ⁱ. Reasons for such wide use include, but are not limited to, its effective ability to disinfect, comparatively inexpensive cost to manufacture and purchase, and the ease with which chlorine levels can be adjusted and monitored. To date, our preliminary research reveals that there are primarily two types of chlorinating agents:

- “Inorganic chlorinating agents such as calcium hypochlorite, lithium hypochlorite, and sodium hypochlorite; and
- Organic chlorinating agents such as trichloroisocyanuric acid, potassium dichloroisocyanurate, and sodium dichloroisocyanurate.”ⁱⁱ

The active ingredients of the chlorine products that appeared in the literature as most commonly used for residential pool sanitization include:

- Calcium hypochlorite (tablet or granule form);
- Lithium hypochlorite (granule form);
- Sodium dichloroisocyanurate (granule form); and
- Trichloroisocyanuric acid (granule form).ⁱⁱⁱ

Both environmental and health impacts exist for these chemicals. The labels of these products carry both poison and corrosive symbols. Oxidizing and corrosive materials can cause damage to human skin, eyes, respiratory and digestive tracts, and can also cause damage to metals. The chlorine products are flammable and toxic if ingested. Moreover, should the chlorine products spill, their fate in the natural environment could be imminently detrimental to surrounding organisms.^{iv}

Seemingly, the efficacy and dosing quantities vary for each of the chemicals products listed above. It would appear that there are tradeoffs depending on the product chosen. For instance, in outdoor pools it is recommended to use calcium hypochlorite in conjunction with a cyanuric acid stabilizer to decrease the degradation of chlorine by U.V. radiation. However, calcium can cause scale build up and, therefore, anti-scaling additives are often added to these products.^v Additional health and environmental impacts need to be considered for each of these additives. Conversely, chlorinated isocyanurates are stable, but require free chlorine levels in a pool to be maintained between 2 and 5 ppm (mg/L) as opposed to 1 to 2 ppm (mg/L) for calcium hypochlorite. As a result, more of the product is needed.^{vi}

With respect to spas, bromine-based products have been marketed as the preferred sanitizing agent. Typically it is in the form organic chemical bromo-chloro-dimethylhydantoin (BCDMH) and sold in tablet form. When added to water, BCDMH “is hydrolyzed and forms hypochlorous acid. [...] The hypochlorite ion reacts with bromides to form hypobromous acid”, which is the active sanitizing agent^{vii}. In addition to sanitation, this product oxidizes organic material. BCDMH is less dependent on pH than chlorine, and is “less affected by high temperature and nitrogen wastes” making it a viable option for spas.^{viii}

In terms of environmental and health implications, bromine is a very reactive element; it is potentially corrosive. When spa bromine concentrations reach ~0.5 mg/L side effects can potentially include eye and mucous membrane irritation and the emission of odors. Similar to chlorine, when bromine is released into the natural environment, it has deleterious properties. Furthermore, bromine disinfection by-products have been known to negatively impact human health.^{ix}

In light of the preliminary research results, the EcoLogo Program has questioned whether there is potential for environmental leadership within this suggested category.

Q2a) Do you believe the EcoLogo Program should establish a subcategory for pool and spa sanitizers?

“...Sanitizers and Algaecides that are closely regulated by Health Canada will not fall under the “Green Category”...”

“...Currently the USEPA registers chemicals that are sold in the USA that wish to claim biocidal properties. They typically will not allow other marks or claims on the container in addition to the EPA label. Therefore pool disinfectants that are marketed in the USA would probably have to be excluded from this program...”

“...Disagreed with is that sanitizers and algaecides are considered for certification. That would be horrible and could damaged credibility to the program...”

“...Yes, because the products used in this application are by their very nature designed to kill pathogens and they must be handled correctly or bad things can happen. Producers of pool and hot tub sanitizers have demonstrated environmental leadership in the area of safe handling and transportation of these products...”

“... the category of water sanitizers could pose a particular challenge because most states and provinces specify the chemicals and use levels in public health safety codes to protect swimmers/bathers...”

“...No. The primary consideration for selecting a sanitizer product is efficacy against waterborne pathogens. Microbial efficacy claims are highly regulated and should be beyond the scope of the EcoLabel standard. The discussion document does not identify a potential

basis for distinguishing “environmental leadership” for this product category. It seems unlikely that science-based criteria and performance data would be available to make meaningful distinctions between sanitizer products...”

“...we have some concerns with possibly certifying chlorine base sanitizers and various metal/petro chemical algaecides when they don’t even comply with Canadian Water Discharge Bylaws...”

“...Environmental leadership of pool and hot tub sanitizers can only be established with responsible use, so producers have to promote responsible use of their products to be considered environmental leaders. Their product labels should reflect environmental leadership and could perhaps contain an Eco-Logo with a statement such as “when used according to label directions...”

- **2b) If yes, which water sanitizing product and which spa water sanitizing product represents environmental leadership** (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“...Environmental leadership of pool and hot tub sanitizers can only be established with responsible use, so producers have to promote responsible use of their products to be considered environmental leaders. Their product labels should reflect environmental leadership and could perhaps contain an Eco-Logo with a statement such as “when used according to label directions...”

“...Hydrogen Peroxide...”

- **2c) Can you provide life-cycle-based information for these products that speak to its environmental leadership merit (resource extraction phase, manufacturing phase, use phase, disposal phase)?**

“...The production of Hydrogen Peroxide is relatively green and its application is known to fight Bacteria’s and safe to humans...”

As mentioned above, while water sanitizers such as chlorine – and bromine – based chemicals are often needed to efficiently treat pool and spa water, they will not be included in this version of the standard. Due to their toxicity, these chemicals are regulated by governments, and because they dominate the current marketplace, the EcoLogo Program does not believe they should be included in an environmental leadership standard that strives to identify the top 20 percent of products/services available in the market which have the lowest environmental impacts across all stages of the life cycle.

Despite the reasons mentioned above, the EcoLogo Program is prepared to propose a subcategory for “oxidizers” since they do not always require Federal Insecticide, Fungicide

and Rodenticide Act (FIFRA) registration if the product labeling does not state or imply that it prevents, destroys, controls, or eliminates pests or microorganisms, and research has shown that some oxidizers may be environmentally preferable.
(http://www.epa.gov/oppad001/shock_ltr.htm).

In light of stakeholder comments and additional research, the EcoLogo Program proposes the following criteria:

- To be authorized to carry the EcoLogo™, the oxidizers must:
 - (a) not be manufactured or formulated with:
 - (i) phosphate-based agents,
 - (ii) chlorine-based agents,
 - (iii) bromine-based agents,
 - (iv) biguanide-based agents,
 - (v) peracetic acid.

4.1.2. Category 2 – Algaecides

Algaecides are regulated by both the U.S. Department of Agriculture and by the Pest Management Regulatory Agency of Health Canada – Pest Control Products Act – as a pesticide due to its ability to control for algae growth. Preliminary research has found that algaecides most often used for pool and spa maintenance include:

- Copper Sulfate (liquid copper);
- Colloidal (suspended) Silver;
- Quaternary Ammonium Compounds (QUATs); and
- Polyquats.^x

There are benefits and drawbacks for each of these types of algaecides. While copper is effective at killing algae it tends to cause staining. In response, some copper-based products contain chelating agents to counteract this effect. Furthermore, copper sulfates are highly caustic and, therefore, classified by the EPA as being class 1 – highly toxic – and require the signal words “Danger” and “Poison”^{xi}. The significant environmental impacts of this compound caused the European Union to entertain banning all copper-based algaecides because of the “effects of its use on the aquatic environment, impact on aquatic organisms, and soil accumulation”. The concerns over using a colloidal silver parallel those for copper sulfate.

Similarly, quaternary ammonium compounds (QUATs) have environmental, health and pool specific impacts. In addition to the questionable biodegradability of these compounds and their potential to irritate skin and worsen asthma, QUATs can cause foaming in pools. With respect to algaecide formulation, linear QUAT composition and % concentrate appears to vary depending on the manufacturer. For instance where most QUATs are available with

active concentrations of 5-10%, one QUAT product reviewed was labeled as 60% concentrate: 30% dimethyl benzyl ammonium chloride, 30% dimethyl ethylbenzyl ammonium chloride, and 40% inert ingredients^{xii}. This is relatively misleading as the product contains two linear QUATs at 30% each. Also, it would appear that QUATs are marketed as a broad spectrum algacide.

Please rank the following products from 1-4

4 being the product that represents the greatest environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle) and 1 being the least environmentally preferable product for that category.

TABLE 1. Ranking of Greatest Environmental Leadership (1 least; 4 greatest; below are results provided by a stakeholder)

Criteria Statement Consideration	Product 1 Copper salts	Product 2 Colloidal silver	Product 3 QUATs	Product 4 Polyquats	BTC 1010
Health hazards	1	2	3	4	5
Biodegradability	n/a	n/a	1	2	5
Bioaccumulation potential	1	2	3	3	3
Eco-toxicity	1	2	3	3	4
Cytotoxicity	----- n/d -----				
Skin sensitization potential	-----need more research-----				
VOC content	-----5-----				
Effectiveness against the relevant target organism	5	4	1	3	2
Water consumption requirements for manufacturing of the product	5	4	3	2	3

Q3) Should any of the products mentioned above be restricted in the standard? Do you know of any "better alternatives" to the products listed?

“...Recommend using didecyl dimethyl ammonium chloride, which has no benzene cycle...”

For the product you believe represents environmental leadership, please attempt to fill in all or any of the categories of the table below. If a subcategory is created for algacides EcoLogo will need to know how a product differentiates itself from the rest and create criteria statements accordingly (we are looking for values that represent environmental leadership) (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle). Below are results provided by a stakeholder

Criteria Statement Considerations	Top Product	Response
Active ingredient (s)	Please list the active ingredient and the suggested % concentrate:	Didecyl dimethyl ammonium chloride. 40%
Suggested prohibited ingredient (s)	Please list any ingredients you believe should be prohibited in the formulation:	Copper sulfate
Health hazards	What are the main health hazards associated with this product:	Need more tests.
Biodegradability	Is the product readily biodegradable? Inherently biodegradable?	biodegradable
Bioaccumulation potential	What is the bioaccumulation potential?	Non available
Cytotoxicity	Suggested value:	Should not consider as criteria
Eco-toxicity	Suggested value:	Should not consider as criteria
Skin sensitization potential	Suggested criteria statement: Demonstrate low potential for skin irritancy through an appropriate test of either the whole formulation or active ingredients. An acceptable standard would be an irritation index score of <12.0, as determined from the HET-CAM test. Do you agree with this statement?	
VOC content	What % VOC content should the product have?	< 10%
Water consumption requirements for manufacturing of the product	On average what is the required quantity of water needed to manufacture this	50%

	product?	
Suggested performance test (if exists)	Are there performance tests for this product?	PMRA had approved sources with valid information

Q4a) Should EcoLogo make a subcategory for these algaecides?

"...Sanitizers and Algaecides that are closely regulated by Health Canada will not fall under the "Green Category"..."

"...Currently the USEPA registers chemicals that are sold in the USA that wish to claim biocidal properties. They typically will not allow other marks or claims on the container in addition to the EPA label. Therefore pool disinfectants that are marketed in the USA would probably have to be excluded from this program..."

"...Disagreed with is that sanitizers and algaecides are considered for certification. That would be horrible and could damaged creditability to the program..."

"...we have some concerns with possibly certifying chlorine base sanitizers and various metal/petro chemical algaecides when they don't even comply with Canadian Water Discharge Bylaws..."

- **4b) If yes, are the products used as pool algaecides the same as those used for spa maintenance. If not, can you suggest a spa algaecide that displays environmental leadership** (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

"...Spa's recommended sanitizer level being higher then pool (3 to 5ppm) does not require any algaecide products..."

In light of stakeholder comments and additional research, the EcoLogo Program proposes the following criteria:

To be authorized to carry the EcoLogo, the algaecides must:

- not be manufactured or formulated with:
 - (i) copper-based agents,
 - (ii) silver-based agents (e.g. colloidal silver),
 - (iii) quaternary ammonium compounds containing one or more benzene rings
 - (iv) methylisothiazolinone,
 - (v) chlorine-based agents,
 - (vi) bromine-based agents, and

(vii) biguanide or polyhexamethylene biguanide

- be readily biodegradable

4.1.3. Category 3 – Water Balancers : pH Increasers

With respect to pH increasers, preliminary research has revealed that a significant portion of the products currently available to consumers are anhydrous sodium carbonate (also known as soda crystals or soda ash) products. Sodium is the fourth most-abundant element on earth, comprising about 2.6% of the earth's crust; it makes up many salt compounds with nonmetal materials. Soda ash (Na_2CO_3) – the commercial grade of sodium carbonate – is among the salt compounds with industrial importance.^{xiii} Understandably, pH increasers are important for proper water management; in their absence:

- Water can become acidic;
- Chlorine residuals may dissipate rapidly;
- Eye irritation can occur;
- Metal fittings, pump impeller, heater core may corrode;
- Dissolved metals may leave stains on walls; and
- Rapid Loss of alkalinity may occur.^{xiv}

We are currently unsure of the exact percentage soda ash products hold in the market place. Preliminary research has yet to reveal products with a pH increasing function that have an alternative active ingredient and are for use in a residential pool. This raises concern with respect to potential environmental leadership in this subcategory.

Q5a) Is it the case that more than 80% of pH increasing products are manufactured with a sodium carbonate formulation, therefore, not allowing for environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“...Yes ...”

“...To my knowledge and experience, sodium carbonate is by far the dominant pH increaser for pools, and sodium carbonate and sodium bicarbonate are both used to raise pH in spas - sodium bicarb is used in spas because it is not quite as alkaline as sodium carbonate and it helps prevent against over-shooting your target pH...”

- **5b) If this is not the case can you please state which alternative product does display greater environmental leadership (20 percent of products/services available in the**

market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

- 5c) What % of the market do these products hold?
- 5d) Can you explain why this product has lower environmental and health impacts?

Q6) Are the products used as pool pH increasers the same as those used for spa maintenance. If no, can you suggest a spa pH increaser that displays environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

"...To my knowledge and experience, sodium carbonate is by far the dominant pH increaser for pools, and sodium carbonate and sodium bicarbonate are both used to raise pH in spas - sodium bicarb is used in spas because it is not quite as alkaline as sodium carbonate and it helps prevent against over-shooting your target pH..."

"...No ..."

Please note that this subcategory will be discussed below when dealing with pH decreaseers.

4.1.4. Category 4 – Water Balancers: pH Decreasers.

When searching for a pH decreaseer, a product with a high acidimetry appears to be most desirable; with a high acidimetry a smaller quantity of the product is needed to achieve the desired result. The two most common acids used to mitigate pH fluctuations are muriatic acid and sodium bisulfate. Muriatic Acid is sold as full strength (~31% hydrochloric acid) and half strength (~15% hydrochloric acid). Half strength is said to fume less and, therefore, be less of an irritant compared to the full strength. Sodium bisulfate is sold as a dry acid with a ~93% sodium bisulfate formulation (additional ingredients are typically sodium sulfate salts).^{xv}

In terms of usability, a case can be made for each of these products. Muriatic acid adds to chlorites whereas sodium bisulfate introduces sulfates to the water. Conversely, muriatic acid tends to release potent fumes during the use phase of its life cycle. Information obtained from MSDSs lists the health impacts associated with coming into contact with the concentrated form of these products as: damaging effects on the mucous membranes and upper respiratory tract, severe burns of the mouth, throat, and stomach if swallowed, pain, and tearing and redness if gotten in the eye. Close to no information was found on the environmental impacts of the product throughout its life cycle (resource extraction phase, manufacturing phase, product use phase, and disposal phase). One concern was found amongst the chemical specifications of a sodium bisulfate monohydrate reagent crystals product. The product itself was said to have an allowable phosphate quantity of 20ppm.^{xvi}

Phosphates are a food source for algae; limiting the amount of phosphates in pool water can in turn decrease the need to use additional chemical products such as algaecides and phosphate removers. A reduction in chemical use reduces environmental impacts.

Our preliminary research has indicated that citric acid may be a plausible alternative to both sodium bisulfate and muriatic acid. It would appear that its pH decreasing ability per litre is superior to products currently on the market. Furthermore, citric acid is:

- Listed on the Generally Recognized As Safe (GRAS) list;
- Compatible with pool structural materials; and
- Biodegradable.

Q7a) Do you believe that citric acid is a feasible alternative to sodium bisulfate and muriatic acid? Why?

"...Perhaps the category should be "Water Balance", with subcategories for Total Alkalinity (bicarb and borates), pH Increasers (carbonate and bicarb), pH Decreasers (bisulfate and muriatic acid), Calcium Hardness (calcium carbonate)..."

"...Yes..."

"...Looking for alternatives for "Balancers" is also very difficult. As an example in your discussion document you have taken a look at Citric Acid as an alternative to reduce pH. Citric acid is a very mild acid and would require approx. 4 times the amount to lower pH over Muriatic acid. Furthermore, the cost of Citric acid is at least 3 times more expensive. Would the consumer spend 12 times the amount of money for a greener product?..."

- **7b) If yes, is it reasonable for EcoLogo to make a criteria statement that requires pH decreaseers to have a certain amount of bio-based content?**

"...Citric Acid is a naturally, non corrosive, found substance ..."

7c) If not, is there an alternative pH decreasing product that displays environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

- **7d) Can you list the environmental and health impacts associated with this product?**

"...we propose citric acid as pH reducer for pool water. We have based our choice on the fact that its pH-decreasing ability per kg or litre is superior to products currently on the market. In addition, citric acid's compatibility with metals, plastics and elastomers is better than that of hydrochloric acid or sodium bisulfate. It is safer for users, since its dust is less corrosive for the

skin, the eyes and the respiratory system. Citric acid is widely used as a food additive, and is included on the Generally Recognized As Safe (GRAS) list. Citric acid comes from a renewable source, does not generate volatile organic compounds (VOCs), and does not contribute to the depletion of the ozone layer. It is not regarded as a bioaccumulative substance and is considered a biodegradable product (98% in 2 days). Its ecotoxicity is 440-760 mg/L...”

Q8) Are the products used as pool pH decreaseers the same as those used for spa maintenance. If no, can you suggest a spa pH decreaseer that displays environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“...Yes...”

Due to the various product formulations and their function in treating the water of pools and spas, the EcoLogo Program has elected to create a subcategory called “balancers” that will cover pH increaseers, pH decreaseers, and alkalinity increaseers.

In light of stakeholder comments and additional research, the EcoLogo Program proposes the following criteria:

To be authorized to carry the EcoLogo, the balancers must:

- not be manufactured or formulated with:
 - (i) boric acid,
 - (ii) hydrochloric acid (i.e. muriatic acid), and
 - (iii) sodium bisulfate.
- be readily biodegradable;

4.1.5. Category 5 – Clarifying/Flocculent Agents

Preliminary research suggests there are two kinds of clarifying agents: polymer-based and alum-based. The polymer-types are either “cationic polymer blends” or “anionic polymer blends”; as such, they bind to charged particles, which cause them to amass into conglomerates large enough to get picked up by the filter. In terms of products, polyquats – the same used in algaecides – are also sold as clarifiers. Their formulation typically consists of Poly{oxyethylene (dimethyliminio)Ethylene (dimenthyliminio)ethylene dichloride}ethylene dichloride}. With respect to raw materials, synthetic polymers are petroleum-based.

Aluminium sulphate was identified as a common flocculent and can be produced by dissolving aluminum hydroxide in sulfuric acid^{xvii}. Under neutral or slightly-alkaline aqueous conditions this compound reacts with solid particles to form an aluminum hydroxide precipitate.^{xviii}

Alternatives to polyquats and aluminum sulfates are aluminum chlorohydrates and poly aluminum chlorides. The ingredients for these type of products, found via MSDSs, included, but are not limited to, aluminum chlorohydrate concentration 30-60% and polynuclear inorganic salts (formula $Al_2(OH)_xCl_{6-x}$ $0 < x < 6$).^{xix} This type of coagulant has been used in water treatment for the better part of 30 years. Its manufacturing process typically involves the partial hydrolysis of acid aluminum chloride. With this fluid method technique there are issues around high energy costs, high impurity, and high energy costs. With that being said, it would appear that this is the favored clarifying product. The aluminum in these products is highly charged; as a result, the dosing requirements are less. This potentially translates into a more cost effective alternative to other coagulants because less is required to do more.^{xx}

We are also aware that chitosan-based products are an alternative to the above products. Information is readily available on the coagulating property of chitosan. It is made from chitin – a linear chain of acetylglucosamine groups – which is a non-toxic biodegradable polymer. Chitosan is created via deacetylation which gives rise to chitosan's cationic characteristic.^{xxi} Upon reviewing publically available MSDSs, chitosan acetate clarifying agents appear to have % (w/w) concentrations of ~1.5 to 2%. These products are made of readily available, renewable, bio-based material.^{xxii}

Q9) Are the functions of clarifying and flocculent agents sufficiently similar that they can be lumped together in one subcategory?

"...Clarifiers and Flocculants hampered by semantics. It's my opinion however that they are quite different. I consider "clarifiers" as charged compounds, usually cationic polymers in pool and hot tub treatment that work via "charge neutralization". In this process particles are removed by filtration. They can be used routinely in small doses to add clarity without requiring additional work, such a vacuuming. In contrast flocculants are compounds that are "floc-forming" under specific conditions. Once the flocs form they sink, and like little umbrellas they collect particles and drag them to the bottom of the pool, where they are removed by vacuuming..."

"...Yes..."

Q10a) Of the products listed, is there a product that displays greater environmental leadership than the others (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“...Under the clarifying section we do offer a Chitosan based product which we feel falls under a “Green Label”. It’s a natural product extracted from crab shells. But we also offer a poly aluminum chloride product that is fast and very effective under a number of circumstances. i.e. – it drops dead floating algae to the bottom of the pool...”

“...the flocculants category seems like it could be an area for further development as this could show increased filtration performance, and potentially reduction in water consumption during backwashing or filter cleaning...”

“...Yes Chitosan...”

- 10b) Is there a product not listed that represents greater environmental leadership?

“... No...”

- 10c) For the product you have chosen, could you list environmental impacts associated with it for the different phases of its life-cycle?

“... Biodegradable, renewable resource, waste valorization...”

Q11: Are the products used as pool clarifying/ flocculent agents the same as those used for spa maintenance? If not, can you suggest a spa clarifying/ flocculent agent that displays environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“... Yes...”

Please note that this subcategory will be discussed below when dealing with water conditioners.

4.1.6. Category 6 – Metal Sequestering Agents

Preliminary research suggests the majority of metal sequestering agents available for pool maintenance are either 1-Hydroxyethylidene-1, 1-Diphosphonic Acid (HEDP) or Ethylenediaminetetraacetic (EDTA). The environmental and health impacts for each differ.

HEDP is an organophosphoric acid; it forms strong complexes with transition metals and with calcium and magnesium. It is made from reacting anhydrous phosphorous acid with acetic anhydride. In addition to its function as a chelating agent, it is a marketed scale and corrosion inhibitor. Interestingly, “its acid/alkali and chlorine oxidation tolerance are better than that of other organophosphoric acids (salt)”.^{xxiii} Inherent biodegradation tests indicate a low degree of biodegradation under the standard test conditions. Although this particular type

of metal sequestering agent is slow to break down, when it does, it releases phosphate, a food source for algae

The second product is formulated with Ethylenediaminetetraacetic acid (EDTA). These chelating agents are anionic; they form “tertaneegative anion, and [are] strongly attracted to alkaline earth and transition metal ions”.^{xxiv} According to Holleman (2001), EDTA “forms especially strong complexes with Mn(II), Cu(II), Fe(III), Pb (II) and Co(III)”.^{xxv} Moreover, it can dissolve metal oxide stain deposits and carbonate scale.

EDTA use is prominent enough that it has been listed as a persistent organic pollutant. Preliminary research suggests that EDTA and associated salts are, “cytotoxic and weakly genotoxic, but not carcinogenic”.^{xxvi} With that being said, research also revealed that they can contain heavy metals, such as Pb.^{xxvii} Also, the Dow Chemical Company reported that “mixtures comprised mainly of petasodium EDTA can contain ‘very small amounts’ of nitrilotriacetate”.^{xxviii} This product is listed on the National Toxicology Program as a potential carcinogen. Strong oxidizing agents such as chlorine can attack EDTA. Comparatively, EDTA breaks much more quickly than HEDP.

Similar to the clarifying/ flocculent agent subcategory, chitosan-based products could also potentially be used as a metal sequestering agent.

Q12a) Are chitosan-based products as effective as EDTA and HEDP?

“... Yes...”

“...I would consider chitosan based materials to be clarifiers before I would categorize them as metal sequestering agents, though they may do both. Speaking from experience only, as clarifiers, chitosan based products work extremely well and provide outstanding water clarity...”

- **12b) Which one of the three products listed represents environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)? If you do not believe any are representative of environmental leadership, can you please suggest an alternative product?**

“...Chitosan...”

- **12c) Can you list the environmental and health impacts associated with this product?**

“...Biodegradable, renewable resource, waste valorization and has a non-allergenic, non toxic, non carcinogenic effect on humans...”

- o 12d) Would it be appropriate to create a criteria statement for this category that requires a minimum % of bio-based materials?

"... Yes..."

Q13) Are the products used as pool metal sequestering agents the same as those used for spa maintenance? If not, can you suggest a spa metal sequestering agent that displays **environmental leadership** (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

"... Yes..."

Please note that this subcategory will be discussed below when dealing with water conditioners.

4.1.7. Category 7 – Phosphate Removers

The function of a phosphate remover is to precipitate phosphates out of pool water. Preliminary research suggests that phosphate removers are an unnecessary chemical product for pool maintenance, as was the case for algaecides. If the free chlorine and cyanuric acid levels are balanced, phosphates should not be a problem because algae growth will have been inhibited by the sanitizing agent. Moreover, phosphate removers, such as lanthanum chloride correct only for inorganic phosphate (orthophosphate) as opposed to inorganic **and** organic, which can both be a food source for algae.

The phosphate removers currently on the market tend to be lanthanum chlorides or lanthanum carbonates. The content of several reviewed products include, but are not limited to: lanthanum salt derivative, 64%; lanthanum sulfate, 3-10%; lanthanum chloride, 5-12%; sodium chloride, 2-5%; lanthanum chloride heptahydrate, unknown %.^{xxix}

There are other chemicals such as aluminum salts, aluminum sulfates, ammonium aluminum sulfate and iron oxides also marketed as phosphate removers. However, products such as iron oxide introduce metals to the pool which can create a new problem that requires additional chemical products for treatment. Despite the use of these products, it would appear lanthanum chloride formulations are the preferred phosphate removers in the market place.

Interestingly, the mechanism by which phosphate removers perform their function can result in unfavorable environmental impacts. They amass phosphates into a suspended solid large enough to be caught by the filter. When backwashing, the phosphates and associated phosphate remover readily finds itself in the natural environment. The MSDS of several

phosphate remover products state to “not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters”.

Q14a) Should EcoLogo create a subcategory for phosphate removers in light of the fact that they may not be essential for proper maintenance?

“...Yes...”

“...Yes, because they may reduce the amount of chlorine used...”

“...Phosphate removers are necessary as phosphates create a chlorine demand and by maintaining a constant chlorine level does not always keep the algae away under these circumstances. Also, there are a greater number of pools in Canada using a salt generator. If there is a high level of phosphates in the water, they tend to coat the “cell” and prevent it from doing its job of converting salt to chlorine. Phosphate removers are necessary to make these units function properly...”

- **14b) If yes, is there one product of those listed above (or can you suggest an alternative product) that represents environmental leadership** (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“...No but, research are still ongoing to find solutions and performances related to aluminum sulfate and its phosphate removal property...”

- **14c) Can you list the environmental and health impacts associated with this product?**

“...Not Bioaccumulative, included in the GRAS list...”

Q15) If a subcategory for phosphate removers is created, should there be a criteria statement that calls for a minimum % of bio-based materials?

“...Yes...”

Q16) Are the products used as pool phosphate removers the same as those used for spa maintenance? If not, can you suggest a spa phosphate remover that displays environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

“...Yes...”

In light of stakeholder comments and additional research, the EcoLogo Program proposes the following criteria:

To be authorized to carry the EcoLogo, the phosphate removers must:

- o not be manufactured or formulated with aluminium-based products.

4.1.8. Category 8 – Water Conditioners

This final category is meant to address pool and spa products whose function is to reduce the amount of chemical products required to maintain an optimal pool and/or spa water chemistry. Preliminary research has revealed there are products available on the market that use bio-based materials to accomplish this function. To date, research has pointed to plant-based materials and enzyme-based formulations.

These products break down/consume the organic matter present in pools and prevent the formation of biofilms.^{xxx} The Centre for Biofilm Engineering at Montana State University has performed research which shows that chlorine and other sanitizing agents are effective against planktonic bacteria, but relatively inefficient against biofilm or the bacteria it encompasses.^{xxxi} For pools and spas that have a high use frequency and organic contamination, these products can assist in reducing pool and spa chemical product demand by assisting in the decomposition of “oils, fats, detergents, dirt, pollen, and all other sorts of organic material”.^{xxxii} The presence of these contaminants deactivates the free chlorine/bromine available in pools/spas to kill bacteria. With these products, the chlorine/bromine added is more targeted and effective and, therefore, less is needed.^{xxxiii}

There are also companies that have marketed sodium tetraborate pentahydrate products as a pool additive. The product itself is sold under names such as Proteam's Supreme, Bioguard's Optimizer Plus, Poollife Endure, Guardex Maximizer, etc.^{xxxiv} These products are borates, which have more negative environmental impacts than the enzymes and plant-based conditioners. For example, the MSDS for one of these products states, “Borax can be harmful to plants and other species. Releases to the environment should be minimized”; granted, this ecological consideration is for large spills.^{xxxv} Comparatively, preliminary research suggests that borates may not display as much environmental leadership as similar products.

Q17) Is ‘water conditioners’ the appropriate subcategory name for these products?

“...Yes...”

“...I would prefer to see a specific category for "Enzymes" than to have them lumped together with other dissimilar products in a general category. Borates will have a challenge meeting any stringent environmental requirements and consumers of Enzymes could benefit from the scrutiny...”

Q18a) Should EcoLogo create a subcategory for water conditioners?

"...No, should be eliminated as it seems to be a category for marketing of products that don't have a direct use or value yet the title implies a certain benefit..."

"...No..."

- 18b) If yes, is there one product of those listed above (or can you suggest an alternative product) that represents environmental leadership (20 percent of products/services available in the market at the time of the development or revision of a standard, which have the lowest environmental impacts across all stages of the life cycle)?

"...Sphagnum Moss has been rediscovered and showed properties to remove biofilm in spa and pool waters. Drs David R. Knighton and Vance Feigle from Minneapolis MN with the support of the Montana State University have become leaders in this technology adapted to the pool and spa industry..."

- 18c) Can you list the environmental and health impacts associated with this product (resource extraction phase, manufacturing phase, use phase, disposal phase)?

"... Effect on environment are spectacular. The specie of Sphagnum moss showing the best results is harvested in controlled bogs in New-Zeland where no machinery is used and where workers are transported by helicopter only to the bogs thus protecting its environment. The moss used in pool and spa comes from the flower of the plant which was in the past, waste as only the stem of the plant was used, therefore a waste valorization. It is also safe on humans as it was used prior to the discovery of penicillin to heal wounds and keep bacteria from spreading thru-out the body..."

Q19) If a subcategory for water conditioners is created, should there be a criteria statement that calls for a minimum % of bio-based materials?

"...Yes..."

Due to the various product formulations and their function in treating the water of pools and spas, the EcoLogo Program has elected to create a subcategory called "Enhancers" that will cover clarifying agents, flocculants, metal sequesters, and conditioners.

In light of stakeholder comments and additional research, the EcoLogo Program proposes the following criteria:

To be authorized to carry the EcoLogo, the enhancers must:

- be partially or entirely formulated or manufactured with biobased content;

- not be manufactured or formulated with:
 - (i) petroleum-based products,
 - (ii) polyacrylamides,
 - (iii) phosphonate-containing compounds,
 - (iv) quaternary ammonium compounds,
 - (v) aluminium-based compounds
 - (vi) ethylenediaminetetraacetic acid (EDTA),
 - (vii) 1-hydroxyethylidene-1, 1-diphosphonic acid (HEDP),
 - (viii) nitrilotriacetate,
 - (ix) tetraborate pentahydrate,
 - (x) borates or boric acid,
 - (xi) sodium silicate,
 - (x) ferric chloride and ferric sulfate,
 - (xi) polyethyleneamines.

4.2 Prohibited and Restricted Substances

At present, the seven potential subcategories for the EcoLogo Pool and Spa Chemical Products standard are:

- ~~Water sanitizers~~
- Algaecides
- Water balancers – pH increasers
- Water balancers – pH decreasers
- Clarifying/flocculent agents
- Metal sequestering agents
- Phosphate removers
- Water conditioners

Q20a) Do you believe the EcoLogo Program should prohibit and/or restrict any substances from the formulation of any/all the subcategory products?

"...Yes..."

"... Yes, products that persist in the environment and in the biosphere, and products that cause human illness, like carcinogens and asthma causing agents..."

"...This is a reasonable concept, but it would need to be based on widely accepted criteria that would not be legally challenged as restricting trade..."

“... EcoLabel should adopt science-based criteria in all cases. Criteria should address measurable product attributes, and not simply prohibit chemicals based on an undefined and unsupported assertion of a health or environmental hazard...”

Examples of substances to prohibit or restrict are, but are not limited to:

- Solvents;
- Specific elements or chemical compounds;
- VOCs;
- Carcinogens (IARC; Group 1, Group 2A, Group 2B, Group 3, and Group 4); and
- Substances designated as asthma causing agents by the Association of Occupational and Environmental Clinics (AOEC).

20b) If yes, can you list what the prohibited and/or restricted substances for each are, and suggest maximum limit amounts for the restricted substances?

“...Refer to CCD-146 (same restrictions)...”

Please note that this subcategory will be discussed below when dealing with Environmental Hazards.

4.3 Health Hazards

At present, the eight potential subcategories for the EcoLogo Pool and Spa Chemical Products standard are:

- ~~Water sanitizers~~
- Algaecides
- Water balancers – pH increasers
- Water balancers – pH decreasers
- Clarifying/flocculent agents
- Metal sequestering agents
- Phosphate removers
- Water conditioners

Q21a) Do you believe the EcoLogo Program’s Pool and Spa Chemical Products standard should make criteria statements that address human health impacts (human toxicity, skin and eye irritation, respiratory sensitization) for each of the eight subcategories?

“...Yes...”

“...Yes...”

“... Refer to CCD-146 (same restrictions)...”

"... Ingestion toxicity could be addressed by referencing NSF Standard 60. Criteria would need to be developed for the dermal, olfactory and inhalation effects..."

"... Yes, products that persist in the environment and in the biosphere, and products that cause human illness, like carcinogens and asthma causing agents..."

- 21b) If yes, which health impacts should be addressed for each subcategory? Do you have alternative health impacts and/or testing methods to suggest?

"...Non-Carcinogenic using IARC methods..."

Please note that this subcategory will be discussed below when dealing with Environmental Hazards.

4.4 Environmental Hazards

At present, the eight potential subcategories for the EcoLogo Pool and Spa Chemical Products standard are:

- ~~Water sanitizers~~
- Algaecides
- Water balancers – pH increasers
- Water balancers – pH decreaseers
- Clarifying/flocculent agents
- Metal sequestering agents
- Phosphate removers
- Water conditioners

Q22a) Do you believe the EcoLogo Program's Pool and Spa Chemical Products standard should make criteria statements that address environmental hazards (biodegradability, aquatic toxicity) for each of the eight subcategories?

"...Yes..."

"...Yes..."

"... Biodegradation is a potentially important factor for consideration for any "eco/green" assessment and the reference standards may be appropriate, but I am not familiar with their requirements and whether these documents are the best assessment tool for the chemicals. The aspect of whether the chemicals are toxic to aquatic life is usually what is sought in the pool/spa. But impact on the local flora/fauna would be a concern when the

water is drained or released to waste sewer (treatment plant or septic system) or storm sewer (river/lake) or into the homeowners or neighbors lawn..."

- **22b) If yes, which environmental impacts should be addressed for each subcategory? Do you have alternative environmental impacts and/or testing methods to suggest?**

"... Biodegradability using OECD 301 reference ..."

Due to the various product formulations and their function in treating the water of pools and spas, the EcoLogo Program has elected to create a generic section in the proposed standard for which the criteria will apply to all the product subcategories (i.e. oxidizers, algacides, balancers, enhancers, and phosphate removers). This section will be called "General Pool and Spa Water Treatment Products Requirements".

In light of stakeholder comments and additional research, the EcoLogo Program proposes the following criteria:

To be authorized to carry the EcoLogo, all pool and spa water treatment products must:

- demonstrate by due diligence that efforts have been made to ensure packaging with post-consumer recycled content and recyclability;
- be accompanied by detailed instructions on maximizing product performance, and indications for the proper waste disposal and the recyclability of the container and/or packaging materials;
- not be formulated or manufactured with any chemicals that are included in the International Agency for Research on Cancer (IARC) lists for proven (Group 1), probable (Group 2A), or possible (Group 2B) carcinogens;
- not be formulated or manufactured with toxic metals, including but not limited to, arsenic, cadmium, chromium, lead, copper, silver and mercury;
- not be formulated or manufactured with simazine and/or altrazine;
- not be a skin irritant. The product shall be not be considered a skin irritant under any of the following scenarios:
 - test data shows that the whole-product is not a skin irritant when tested at the most concentrated at-use dilution. A substance is considered an irritant if it causes erythema or edema of the skin graded at 2 or more as defined by OECD 404;
 - test data shows that each ingredient present at or above a concentration of 5% is not a skin irritant, or

- if test data shows that any known skin irritants are non irritating when present at 5% or greater in the product as sold;
- state the active ingredient and percentage of active ingredients on the label; and
- the product manufacturer has made efforts to ensure that environmental claims made on the label meets the U.S. Federal Trade Commission and/or the Competition Bureau of Canada.

4.5 Energy, Water, and Waste

The following are examples of typical types of impacts often included in EcoLogo standards:

- Renewable energy/RECs/carbon offsets;
- Energy reduction/conservation;
- Water reduction/conservation; and
- Waste reduction.

Preliminary research has failed to find relevant data to validate whether energy conservation, water conservation, and waste reduction are critical aspects of leadership in manufacturing pool and spa chemical products. In other words, it is unclear if the manufacturers of pool and spa chemical products are currently buying RECs and/or carbon offsets, or using technology to reduce energy and water consumption. Without data, the EcoLogo Program does not intend to propose such requirements in the standard.

Q23) Do you believe that in order to distinguish environmental leadership, the EcoLogo Program should establish strict requirements for energy and/or water consumption and waste reduction at the manufacturing site of the product? Why?

"...I think manufacturing should be taken into consideration as second tier criteria. I think the primary criteria should focus on what is actually being used in the backyard and what impact the product and the application (directions for use) have in individuals and the environment..."

"...Yes, Manufacturers of Ecologo products have to establish firm environmental leadership including reducing water consumption, energy and control waste waters..."

"... This area of water conservation or energy savings would seem to be of interest to most homeowners and communities..."

While the EcoLogo Program recognized that some leadership may be found in the manufacturing of pool and spa water treatment products, it has failed to find sufficient data on water and energy consumption from manufacturing sites to clearly establish a rationale for leadership criteria. Therefore, at this time, the Program will not establish criteria for water and

[energy consumption. Waste reduction, however, has been addressed in the Packaging section below.](#)

4.6 Packaging

The following are examples of typical types of impacts often included in EcoLogo standards:

- Recycled content
- Recyclable
- No PVC

Preliminary research suggests that packaging made without PVC plastic and with a percentage of recycled resin are readily available on the market. However, it is unclear what environmental leadership for the packaging category is. Furthermore, Health Canada's Consumer Product Safety: Regulations for Swimming Pool and Spa Chemicals states to, "not reuse the empty containers [and] dispose of them in household garbage". Consequently, the EcoLogo Program does not intend to propose a "recyclable" requirement in the standard, but does propose to create criteria statements for recycled content and no PVC. ^{xxxvi} Potential options include asking for a minimum post-consumer material content of 25% for product containers. With respect to primary packaging it is proposed, for material other than plastic, that a minimum of 25% post-consumer material be required.

Q24) In terms of packaging material for pool and spa chemical products, what represents environmental leadership?

["...Secure protection against package failure, followed by the ability to reduce \(use less\), recycle, and reuse..."](#)

["... Plastic bottles made out of recycled plastic, recyclable. Pails made out of recycled plastics..."](#)

["... Recycled content seems like a good idea unless you demand the recycled materials go into specific products. It may not be as durable as virgin material which might lead to safety concerns. Also it might add unknown contaminants to the chemicals that might then contaminate the water. The lack of traceability of the post industrial or post consumer waste presents a problem when using recycled materials in an area that impacts human health and/or safety..."](#)

["... The proposed "no PVC" requirement for packaging is unwarranted. Polyvinyl chloride \(PVC or vinyl\) is an important plastic packaging material that protects and preserves products. The background document offers no indication of how such a restriction would demonstrate environmental leadership for pool chemicals. Consideration of any such provision must be based on life cycle performance data on both PVC packaging and the alternatives that are likely to be used..."](#)

Packaging requirements have been dealt with above and criteria established in the standard under the section called 'General Pool and Spa Water Treatment Products Requirements'.

Note: All of the products will be required to be in accordance with all pertinent and current regulatory requirements for packaging.

4.7 Performance

Preliminary research has failed to find relevant data to validate whether performance tests are available for pool and spa chemical products. It is important that EcoLogo certified products perform as well as non-certified products if consumers are to trust the efficacy of environmentally preferred products.

Q25) Do you believe the EcoLogo Program should establish strict requirements regarding product performance? If yes, what performance tests should be required?

"... I'm not sure strict is the right word, but some performance metrics should be involved in the process to insure their is a value gained for using the product..."

"... Yes, performing at 75% and more versus the conventional products..."

"... This is an area of great interest but there is not much of any performance comparison data or standards for stand alone chemicals..."

Performance requirements have been dealt with above and criteria established in the standard under the section called 'General Pool and Spa Water Treatment Products Requirements'.

4.8 Labelling Requirements and Conditions for EcoLogo Use

The following are examples of the types of criteria related statements often included in EcoLogo standards:

- Product information (i.e. Type III labels)
- the U.S. Federal Trade Commission and/or the Competition Bureau of Canada. (greenwashing)

4.8.1. Product Information on Labels

EcoLogo proposes to include a criteria statement for product information on labels in the *Product Specific Requirements*. Preliminary research has revealed that various products such as water sanitizers are already mandated to state the percentage of active ingredients on the

label. The following statement is representative of what a criteria statement could potentially be:

- (a) *State the percentage of active ingredients on the label.*

Rationale:

EcoLogo wants to ensure that consumers are aware of the active ingredients in the product they intend to purchase.

4.8.2. *Environmental Claims Labelling*

EcoLogo proposes to include a criteria statement for environmental claims labeling in the *Product Specific Requirements*.

Rationale:

This requirement is to assure that EcoLogo products avoid greenwashing claims.

Note: All of the products will be required to be in accordance with all pertinent and current regulatory requirements for labelling.

FTC: <http://www.ftc.gov/bcp/grnrule/guides980427.htm>

CSA: <http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02701.html>

Q26) Do you believe the EcoLogo Program should establish requirements for product information on labels and environmental claims labelling? Why?

["...Yes, I like to know what's in the product I'm buying, and I'd like to know the claims made on products are appropriate and qualified..."](#)

["...Yes, consumer awareness..."](#)

["...This is a good idea and requiring percent purity or active ingredient as well as production date coding of chemicals \(not just repackaging date\) could be of use to chemical users..."](#)

[The EcoLogo Program is not yet prepared to integrate a strict verification/auditing procedure to assure that environmental claims meet the U.S. Federal Trade Commission and/or the Competition Bureau of Canada guidelines in this standard. However, the Program strongly recommends that manufacturers/producers follow these guidelines wherever applicable, as the Program reserves the right to screen the product labels for compliance.](#)

[Labelling claims requirements have been dealt with above and criteria established in the standard section called "General Pool and Spa Water Treatment Products Requirements".](#)

5 Additional Questions

Q28) The scope of this standard speaks to pool and spa chemical products that are added directly to pool and spa water. As for the products used around-the-pool (pool cover, tiles, furniture, etc.) the EcoLogo Program proposes certifying them against CCD-146: Hard Surface Cleaners. Do you agree with this proposal? Why or why not?

"...Yes I agree, including these ancillary products in the pool/hot tub standard expands the Scope to products used for a completely different purpose, although vinyl and tile cleaners that actually come in contact with pool water should probably be included..."

"...No. Because even though they are used inside the pool and spa they are in contact with users that go into the spa and could have consequences to Humans i.e. Liner Cleaner (residues will go into the water), Sand filter cleaner (could have residue go back into the water)..."

Products such water fragrances and dyes are not covered in this standard. Other specialty products such as concrete and pool and spa cover cleaners may be certified under the EcoLogo standard called: CCD-146: Hard Surface Cleaners. At the current time, CCD-146 is currently under revision, so attention to pool and spa products shall be given accordingly. If the revision of CCD-146 should find that pool and spa hard surface cleaners ought to fall under CCD-171, then the necessary changes will be made at the next revision of the pool and spa standard.

Q29) EcoLogo standards are established so that the top 20 percent of products within a specific category can achieve certification. Do you believe there is enough separation among subcategory products to support the creation of an environmental leadership standard by the EcoLogo Program?

"...I was thinking about this concept as I was answering the questions, given the limited number of products. However, there are some very substantial differences in the products used to treat pools and hot tubs, and I think a case can be made that there is enough separation to warrant an environmental leadership standard..."

"... Yes..."

"...Whether the Pool & Spa Chemical industry can be categorized in any part as "Green" is in question..."

"...Overall it seems that there are two challenges to develop an evaluation program to address the environmental impact, efficacy, and safety of pool chemicals. 1.) The evaluation program would conflict with some existing programs. 2.) Also the investment required to develop and operate this program is probably far larger than the residential pool market and probably even the commercial pool market could support..."

Q30) Do you believe this Discussion Document has addressed the predominant and important aspects pertinent to the establishment an environmental leadership standard for pool and spa chemical products?

"...Yes, with the addition of my comments above, and careful consideration of comments from other industry leaders..."

"... Yes..."

* Please feel free to comment on any aspects that were not addressed by the discussion document.

6 References

-
- ⁱ American Chemistry Council. *Chlorine and Swimming Pools and Spas FAQs*. Retrieved from: http://www.americanchemistry.com/s_chlorine/sec_content.asp?CID=2183&DID=9228&CTYPEID=109
- ⁱⁱ Government of Canada, Canadian Centre for Occupational Health and Safety (CCOHS) (2006). *Chemicals & Materials: Swimming Pool Chemicals*. Retrieved from: <http://www.ccohs.ca/oshanswers/chemicals/swimming.html>
- ⁱⁱⁱ Government of Australia (2007). *Federal Register of Legislative Instruments F2007L03960. Agricultural and Veterinary Chemical Code: Listable Chemical Product (Home Swimming Pool and Spa Products) Standard 2007*. Retrieved from: <http://www.comlaw.gov.au/ComLaw/Legislation/LegislativeInstrument1.nsf/0/A280DAE89B2E27AAC A25736A00067679?OpenDocument>
- ^{iv} Lenntech. *Disinfectants: Sodium Hypochlorite*. Retrieved from: <http://www.lenntech.com/water-disinfection/disinfectants-sodium-hypochlorite.htm#ixzz0K8SolsTq&C>
- ^v Chemicallyland21.com. *Calcium Hypochlorite*. Retrieved from: <http://chemicallyland21.com/industrialchem/inorganic/CALCIUM%20HYPOCHLORITE.htm>
- ^{vi} Erstas, K. (2007). *Got Algae? AQUA: The Business Publication for Spa & Pool Professionals*. Retrieved from: <http://www.aquamagazine.com/articles/article.aspx?articleid=1317&zoneid=13>
- ^{vii} Lenntech. *Disinfectants: Sodium Hypochlorite*. Retrieved from: <http://www.lenntech.com/water-disinfection/disinfectants-sodium-hypochlorite.htm#ixzz0K8SolsTq&C>
- ^{viii} Rigsby, K. (2008). *Chemistry and Maintenance of Bromine Spas*. The Association of Pool & Spa Professionals. Retrieved from: <http://www.apsp.org/ClientResources/Documents/apspwqe-news/Oct15/BromineSpas.htm>
- ^{ix} North Carolina Department of Environment and Natural Resources. *Water Chemistry for Swimming Pools*. Division of Environmental Health. Retrieved from: <http://www.deh.enr.state.nc.us/ehs/chem.htm>
- ^x Tamminen, T. (2000). *The Ultimate Pool Maintenance Manual*. Retrieved from: <http://books.google.ca/books?id=fb04YPy-XIEC&printsec=frontcover#v=onepage&q=&f=false>
- ^{xi} Galbreath-O'Leary, B. (2009). *A Call to Ban Copper Sulfate (an Algaecide) for Use in America's Waters*. Ezine Articles. Retrieved from: [http://ezinearticles.com/?A-Call-to-Ban-Copper-Sulfate-\(an-Algaecide\)-For-Use-in-Americas-Waters&id=2367590](http://ezinearticles.com/?A-Call-to-Ban-Copper-Sulfate-(an-Algaecide)-For-Use-in-Americas-Waters&id=2367590)

-
- ^{xii} Arch Chemicals, Inc. (2002). *MSDS, HTH Poolife Super Algaebomb 60 Algaecide*. Retrieved from: www.opacific.com/MSDS/HTH_algaebomb_60_algaecide.doc
- ^{xiii} Burke, R. (2002). *Hazardous Materials Chemistry for Emergency Responders*. Retrieved from: <http://books.google.ca/books?id=Yu7XRm3T1YMC&printsec=frontcover#v=onepage&q=&f=false>
- ^{xiv} North Carolina Department of Environment and Natural Resources. *Water Chemistry for Swimming Pools*. Division of Environmental Health. Retrieved from: <http://www.deh.enr.state.nc.us/ehs/chem.htm>
- ^{xv} Personal communication (July 17th, 2009). Pool Help Forum.
- ^{xvi} Jost Chemical (2008). *MSDS, Sodium Bisulfate Monohydrate Reagent Crystals*. Retrieved from: <http://www.jostchemical.com/chemicals/2741.html>
- ^{xvii} International Occupational Safety and Health Information Centre (CIS) (2000). *Aluminum Sulfate*. Retrieved from: http://www.ilo.org/public/english/protection/safework/cis/products/icsc/dtasht/_icsc11/icsc1191.htm
- ^{xviii} Chemicallyland.com. *Aluminum Potassium Sulfate*. Retrieved from: <http://chemicallyland21.com/industrialchem/inorganic/ALUMINUM%20POTASSIUM%20SULFATE.htm>
- ^{xix} Kemira. *MSDS, Polyaluminum Chloride Solution*. Retrieved from <http://www.kemira.com/en/solutionsproducts/Pages/PolyaluminumChloride.aspx>
- ^{xx} Kemira. *Polyaluminum Chloride (PAX and SternPAC)*. Retrieved from: http://www.kemirawater.ca/subpages/Polyaluminum_Chlorides.asp
- ^{xxi} France Chitine. *Chitosan: A Natural Product*. Retrieved from: <http://www.france-chitine.com/>
- ^{xxii} Econo-Ecolo (2006). *Le Chitosan: Un Produit Naturel pour le Traitement de L'Eau des Piscines*. Retrieved from: <http://www.econo-ecolo.org/spip.php?article682>; Poolcentre.com. *Chitosan Water Treatment*. Retrieved from: <http://www.poolcenter.com/chitin.htm>
- ^{xxiii} Focus Technology Co. Ltd.. Product Description: HEDP (1-Hydroxy Ethylidene-1, 1-Diphosphonic Acid) (CAS No. 2809-21-4).
- ^{xxiv} Holleman, A. and Wiberg, E. (2001). *Inorganic Chemistry*. San Diego: Academic Press. ISBN 0-12-352651-5.
- ^{xxv} *ibid.*
- ^{xxvi} Lanigan, R. and Yamarik, T. (2002) Final Report on the Safety of EDTA, Calcium Disodium EDTA, Diammonium EDTA, Dipotassium EDTA, Disodium EDTA, TEA-EDTA, Tetrasodium EDTA, Tripotassium EDTA, Trisodium EDTA, HEDTA, and Trisodium HEDTA. *International Journal of Toxicology*, 21 (2): 95-142.

^{xxvii} Nikitakis, J. and McEwen, G. (1990). *CTFA Compendium of Cosmetic Ingredient Composition—Descriptions I and II*. Washington, DC: CTFA.

^{xxviii} Lanigan, R. and Yamarik, T. (2002) Final Report on the Safety of EDTA, Calcium Disodium EDTA, Diammonium EDTA, Dipotassium EDTA, Disodium EDTA, TEA-EDTA, Tetrasodium EDTA, Tripotassium EDTA, Trisodium EDTA, HEDTA, and Trisodium HEDTA. *International Journal of Toxicology*, 21 (2): 95-142.

^{xxix} Natural Chemistry Inc. (2005). *MSDS, Product Phos Free*. Retrieved from: <http://www.poolcenter.com/NY197MSDS.PDF>; HaloSource. Inc. (2007). *SeaKlear: Phosphate Remover*. Retrieved from: http://www.halosource.com/userfiles/MSDS-SEAKLEAR_AQUARIA_Phosphate_Remover.pdf

^{xxx}Poolcentre.com. *Enzyme Water Treatment*. Retrieved from: <http://www.poolcenter.com/enzyme.htm>

^{xxxi}Creative Water Solutions. *PoolNaturally*. Retrieved from: <http://www.cwsnaturally.com/science/index.php>

^{xxxii}Poolcentre.com. *Enzyme Water Treatment*. Retrieved from: <http://www.poolcenter.com/enzyme.htm>

^{xxxiii} Barker, B. (2005). *The Uses and Benefits of Enzyme Based Swimming Pool Chemicals*. Retrieved from: <http://ezinearticles.com/?The-Uses-and-Benefits-of-Enzyme-Based-Swimming-Pool-Chemicals&id=100344>

^{xxxiv}Personal communication (March 28th, 2007). Pool Help Forum.

^{xxxv}Chemtura (2005). *MSDS, BioGuard Algae Optimizer Plus*. Retrieved from: http://www.pools.com/doc_library/docs/123514.pdf

^{xxxvi} Government of Canada, Canadian Centre for Occupational Health and Safety (CCOHS) (2006). *Chemicals & Materials: Swimming Pool Chemicals*. Retrieved from: <http://www.ccohs.ca/oshanswers/chemicals/swimming.html>