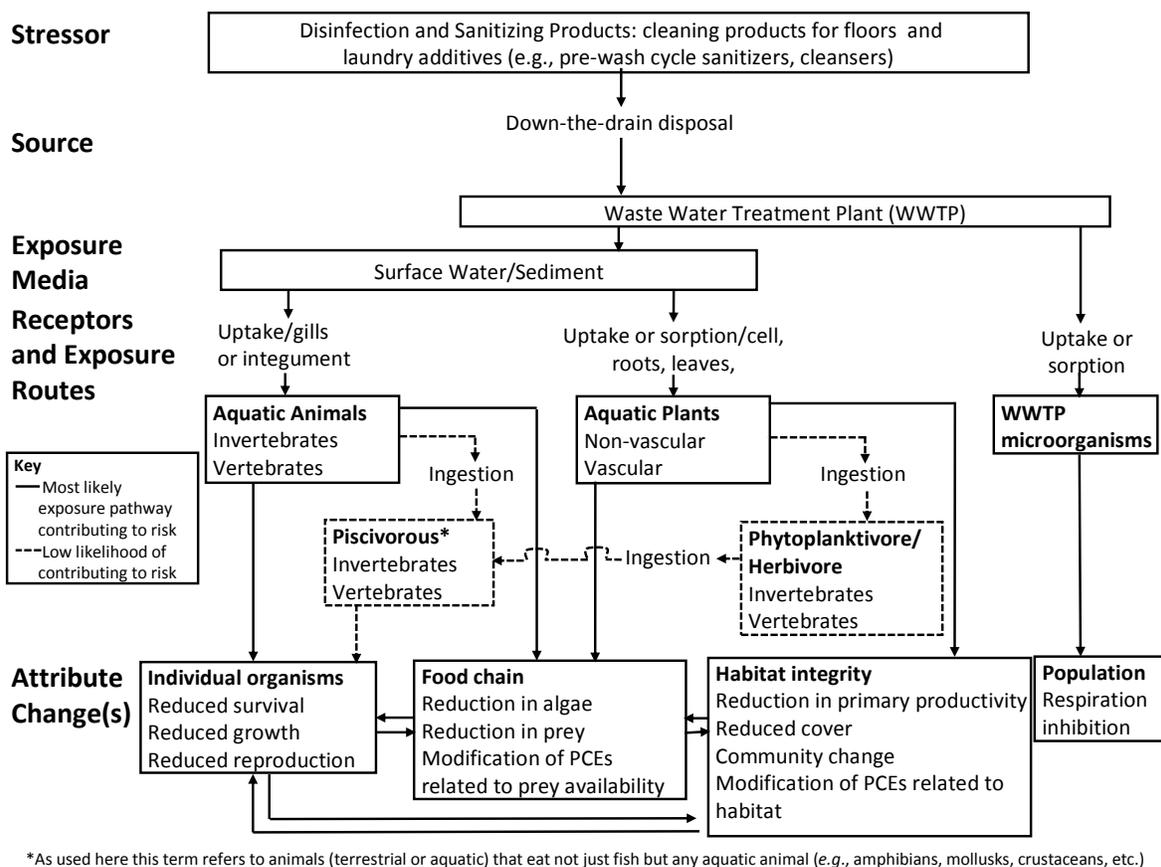


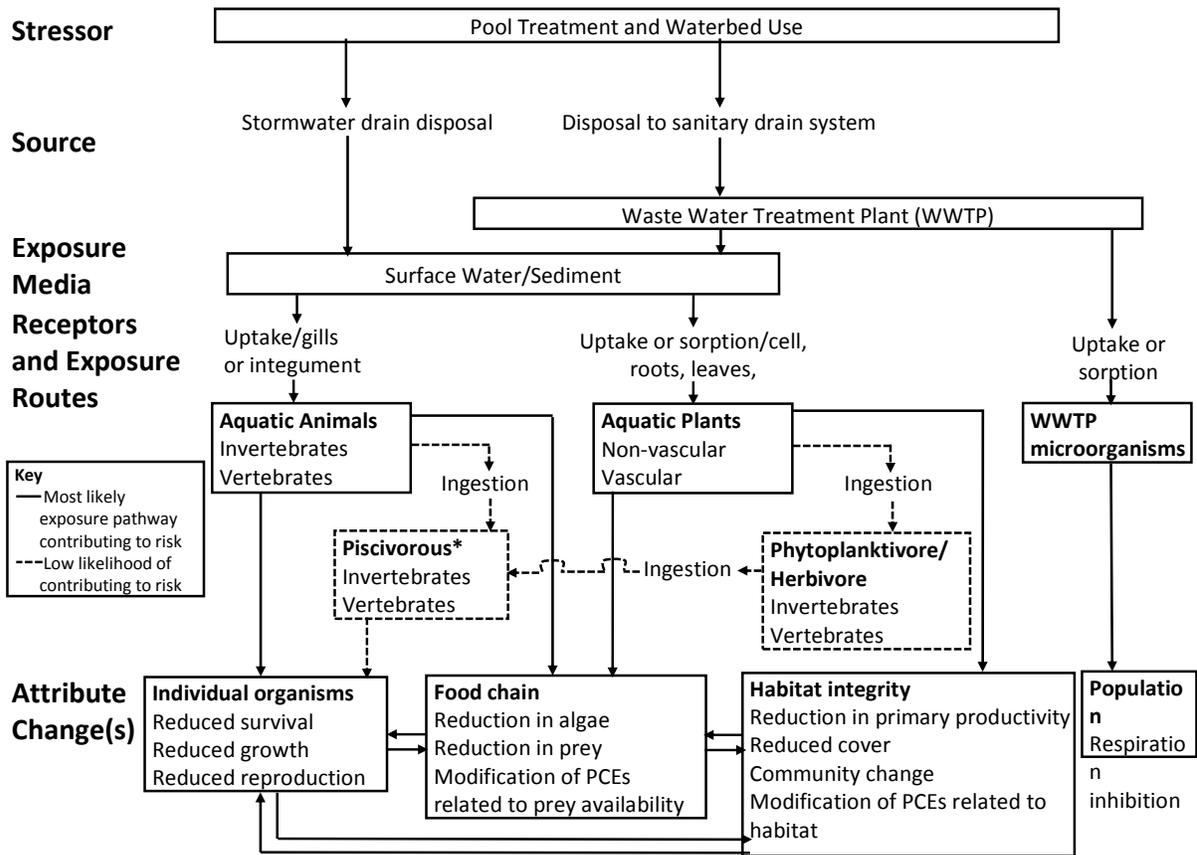
microbial biomass. Figure 1 below contains the conceptual model for the use of disinfection and sanitizing products including cleaning products for floors and laundry additives (e.g., pre-wash cycle sanitizers, cleansers) which go down the drain after use. Figure 2 below contains the conceptual model for swimming pools and waterbed water uses. Figure 3 contains the conceptual model for cooling towers. Figure 4 contains the conceptual model for in-can preservatives.

The use of chlorinated isocyanurates in industrial processes and water systems has a potential to expose aquatic organisms to hypochlorous acid and cyanuric/isocyanuric acid. However, hypochlorous acid has a finding of “no effect” for cooling towers and water process system uses and therefore is not of concern for chlorinated isocyanurates<sup>2</sup>. The risk assessment to be conducted as part of this registration review will evaluate risk from the chlorinated isocyanuric acid metabolite, isocyanuric acid.



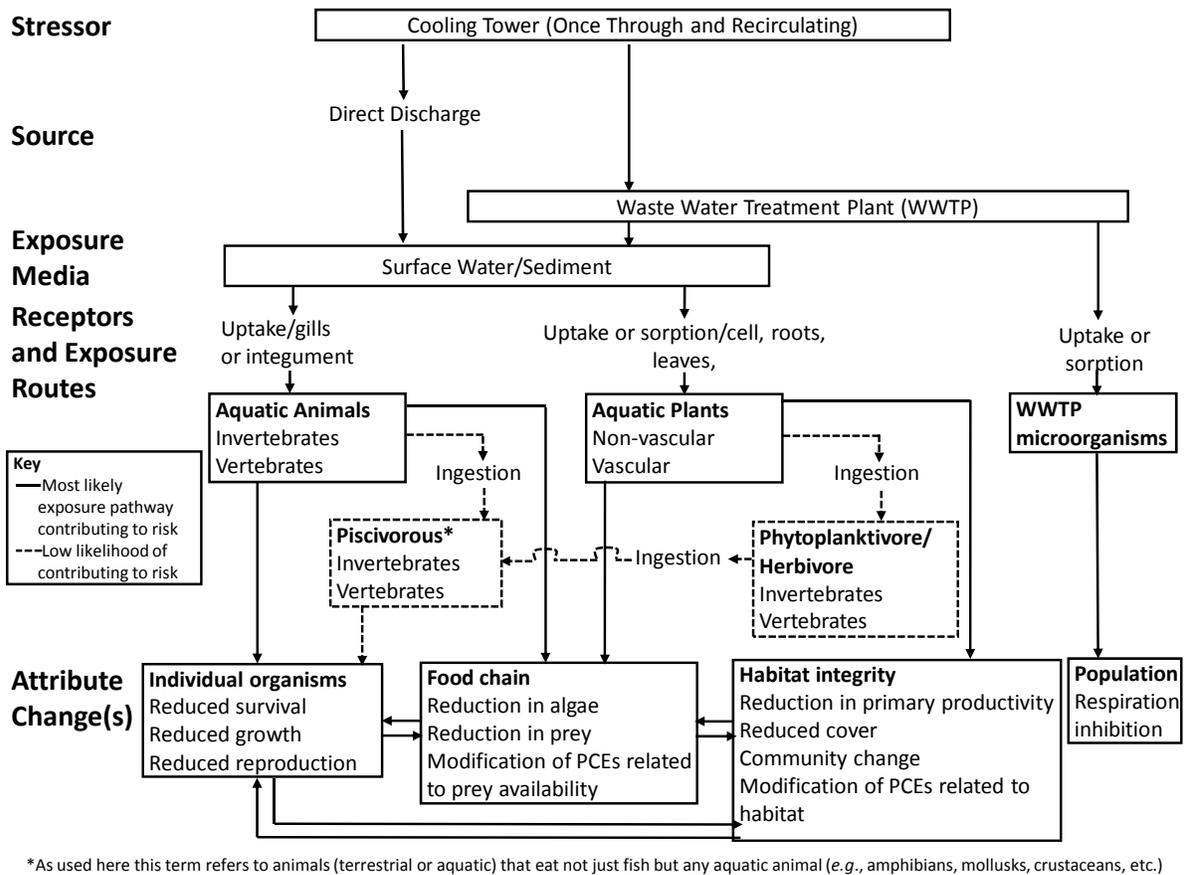
**Figure 1 Conceptual Model for Ecological Exposure and Effects of Chlorinated Isocyanurates and their Reaction Products/Degradates from Sanitizing and Disinfecting Uses for Laundry and Hard Surfaces to Aquatic and Terrestrial Organisms**

<sup>2</sup> Na & Ca Hypochlorite Registration Review: Final Work Plan, Docket ID EPA-HQ-OPP-2012-0004-0006

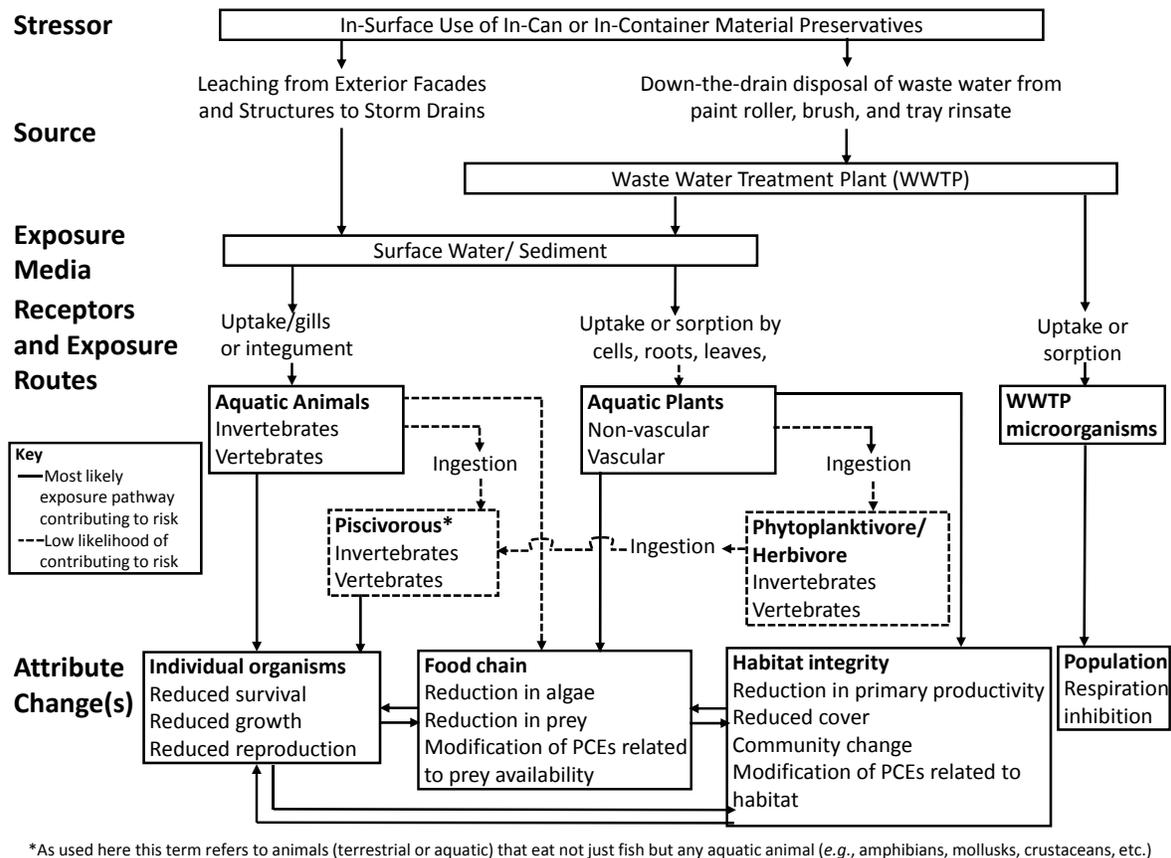


\*As used here this term refers to animals (terrestrial or aquatic) that eat not just fish but any aquatic animal (e.g., amphibians, mollusks, crustaceans, etc.)

**Figure 2 Conceptual Model for Ecological Exposure and Effects of Chlorinated Isocyanurates and their Reaction Products/Degradates from Swimming Pool and Water Bed Uses to Aquatic and Terrestrial Organisms**



**Figure 3 Conceptual Model for Ecological Exposure and Effects of Chlorinated Isocyanurates and their Reaction/Degradates from Cooling Water Tower Uses to Aquatic and Terrestrial Organisms**



**Figure 4 Conceptual Model for Ecological Exposure and Effects of Chlorinated Isocyanurates and their Reaction/Degradates from the Use and Disposal of In-Can or In-Container Material Preservatives to Aquatic Organisms**

## 4.2 Ecological Effects Assessment

Ecological effects data are used as measures of direct and indirect effects to biological receptors. Acute and chronic toxicity data from studies submitted by pesticide registrants along with the available open literature obtained from ECOTOX will be used to evaluate the potential direct and indirect effects of the chlorinated isocyanurates and their degradates to aquatic and terrestrial receptors. Data discussed herein are from registrant-submitted data and from the EPA Office of Water's *Ambient Water Quality Criteria for Chlorine - 1984* (EPA 1985).

### 4.2.1 Mechanism of Action

In the aquatic environment, toxic action of chlorinated isocyanurates is largely due to the formation of hypochlorous acid when chlorine reacts with water. Adverse effects of hypochlorous acid are due mainly to its corrosive action. Acute necrosis may occur. Fish gills-