SAFER CONSUMER PRODUCTS

Introduction to Safer Consumer Products Alternatives Analysis (AA)

DTSC Alternatives Analysis Workshop on Life Cycle Impacts and Exposure Assessment
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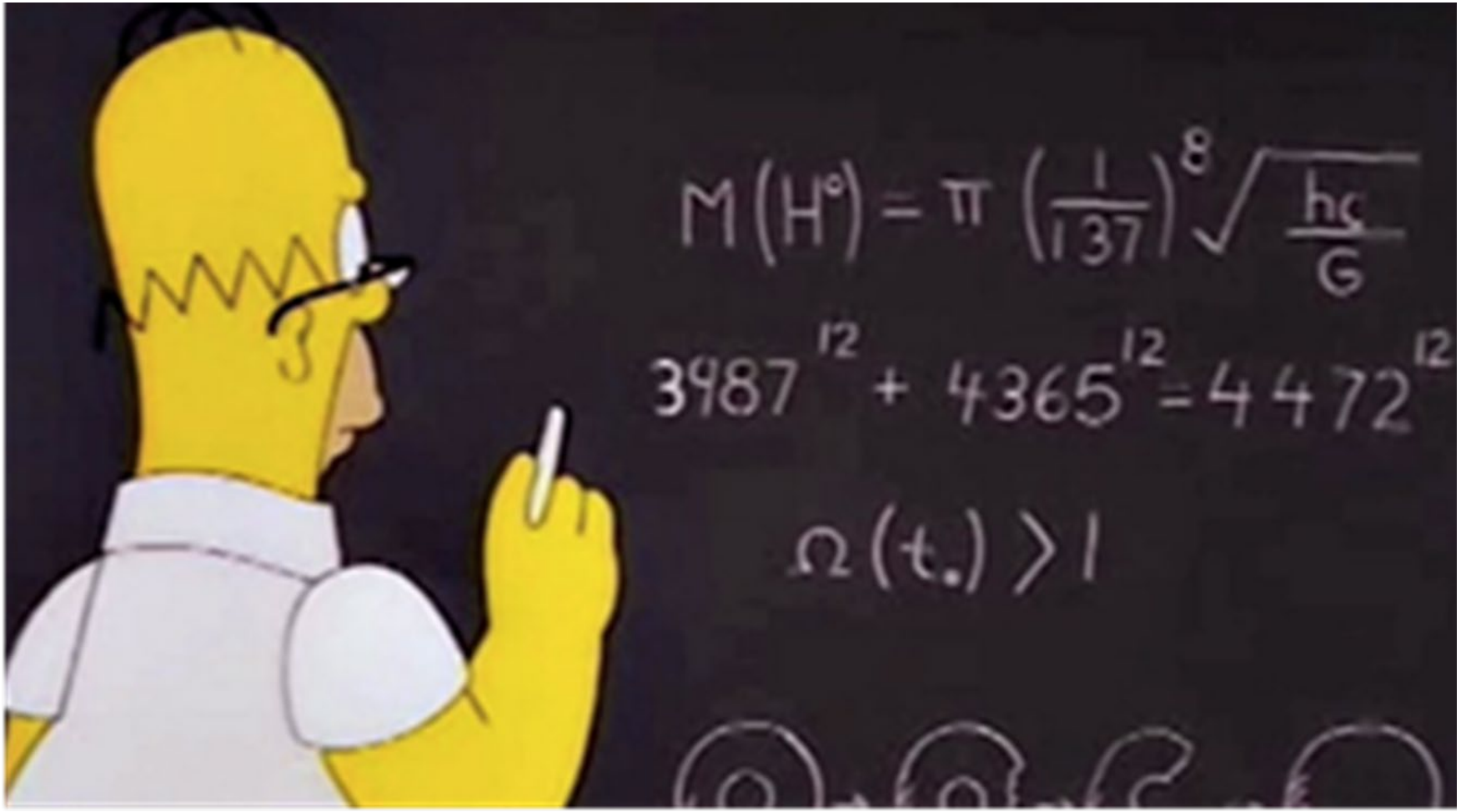
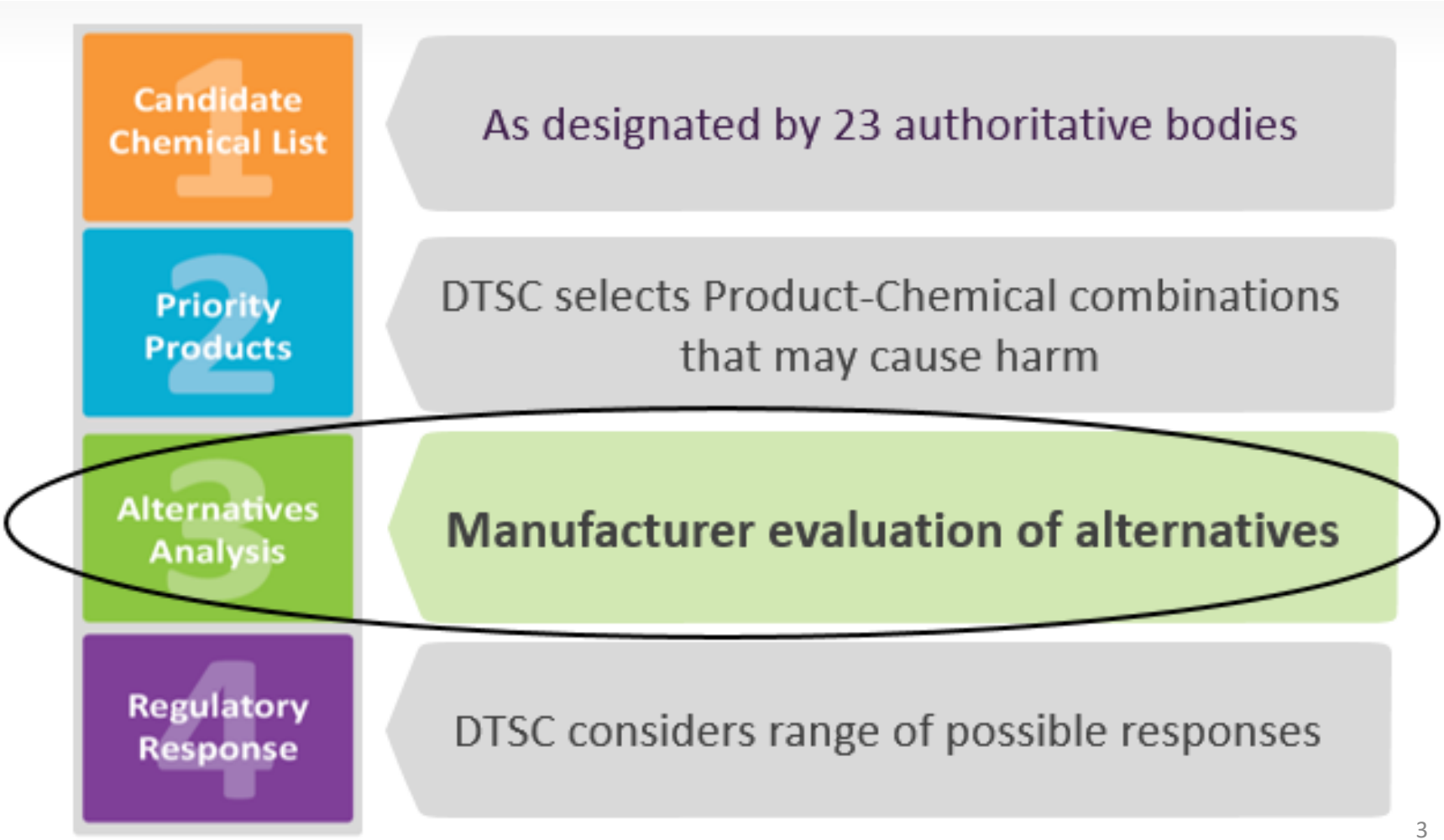


Please note: The contents of this workshop does not alter or determine compliance responsibilities set forth in statutory and regulatory requirements.

Safer Consumer Products framework



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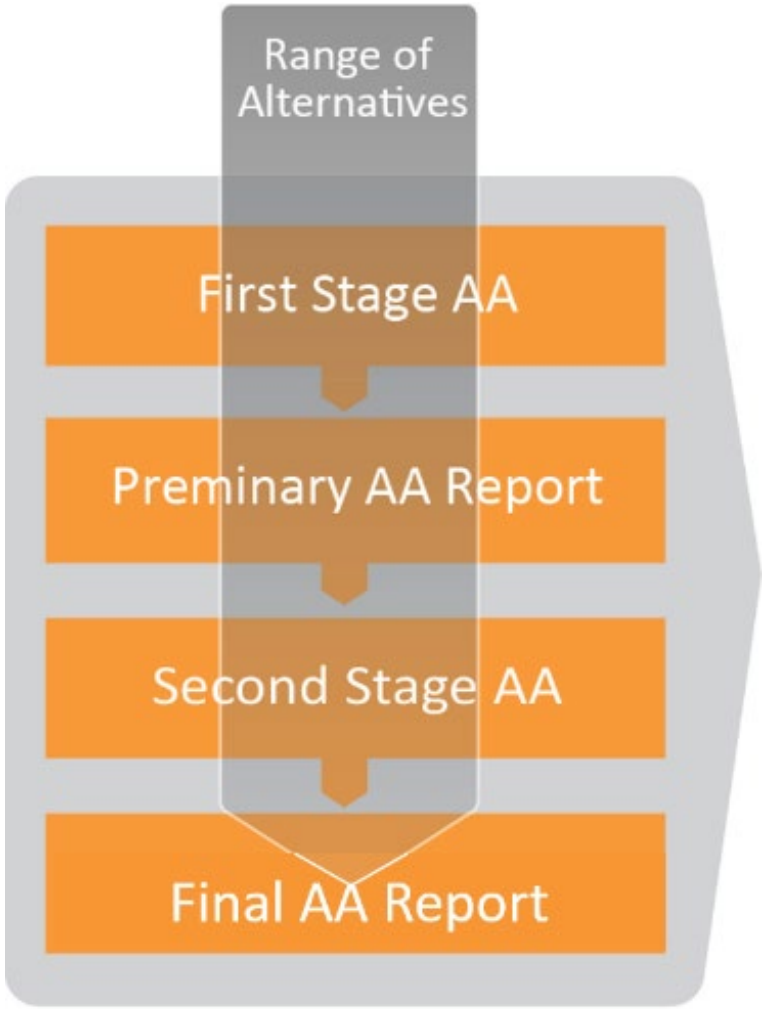
Two Stage Alternatives Analysis



Alternatives Analysis – 1st Stage

Screening Analysis

Step 1: Identify Product Requirements and Function of Chemical of Concern
Step 2: Identify Alternatives
Step 3: Identify Factors Relevant for Comparing Alternatives
Step 4: Initial Evaluation and Screening of Alternative Replacement Chemicals
Step 5: Consider Additional Information
Step 6: Preliminary Alternatives Analysis Report

Alternatives Analysis – 2nd Stage

In-depth Analysis

Step 1: Identify Factors Relevant for Comparing Alternatives
Step 2: Compare the Priority Product and the Alternatives
Step 3: Consider Additional Information
Step 4: Alternative Selection Decision
Step 5: Final Alternatives Analysis Report

Factors to be considered

- Adverse environmental impacts
- Adverse public health impacts
- Adverse waste and end-of-life effects
- Environmental fate
- Materials and resource consumption impacts
- Physical chemical hazards
- Physicochemical properties
- Product function and performance
- Economic impacts

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Adverse Air Quality Impact Definition

- Greenhouse gases

carbon dioxide	nitrous oxide
hydrofluorcarbons	perfluorocarbons
methane	sulfur hexafluoride
nitrogen trifluoride	

- Nitrogen oxides;
- Particulate matter;
- Ozone depleting chemicals;
- Sulfur oxides; and
- California Toxic Air Contaminants

Chemical Hazard Assessment

- Comprehensive list of hazard traits for evaluation
- Adverse public health impacts
  - 20 hazard traits

- Adverse ecological impacts
  - Aquatic, terrestrial, avian, plants, microbes
  - Environmental hazard traits
    - Growth, survival, reproductive and development
    - Phytotoxicity
    - Impairment of waste management organisms

Division 4.5, Title 22, California Code of Regulations, Chapter 54 Green Chemistry Hazard Traits, Toxicological and Environmental Endpoints and Other Relevant Data

Exposure Assessment Considerations

- **Chemical quantity**
- Exposures to the hazardous chemical in the product
- Household and workplace presence of the product
- Exposures during the product's life cycle
- **Bioaccumulation[1]**
- **Persistence[1]**

[1]Division 4.5, Title 22, California Code of Regulations

Chapter 54 Green Chemistry Hazard Traits, Toxicological and Environmental Endpoints and Other Relevant Data

Comparative Exposure Assessment

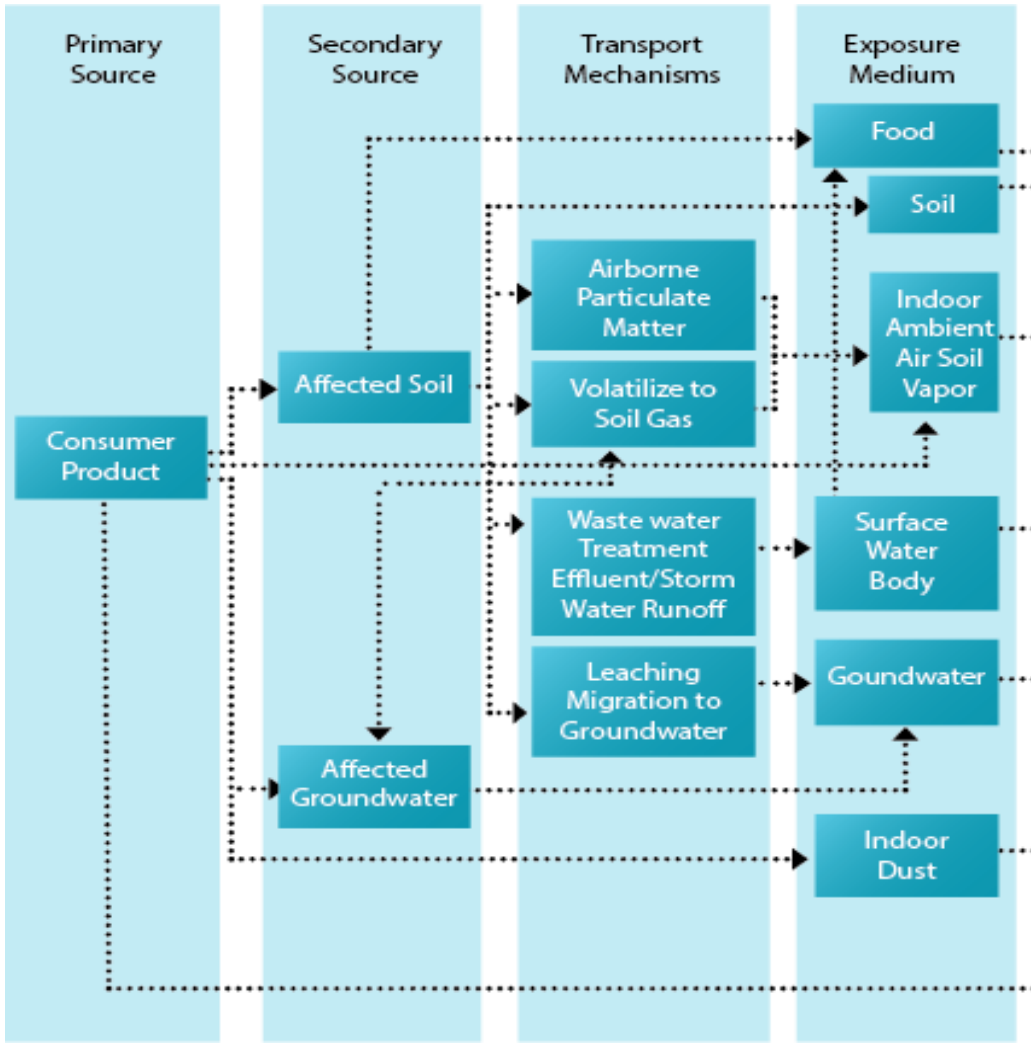
The responsible entity **compares** the Priority Product and the alternatives under consideration using, at a minimum, the same relevant factors and, when applicable, associated **exposure pathways** and life cycle segments

Methods to Evaluate Potential Exposure

- Data and Models for Exposure Assessment

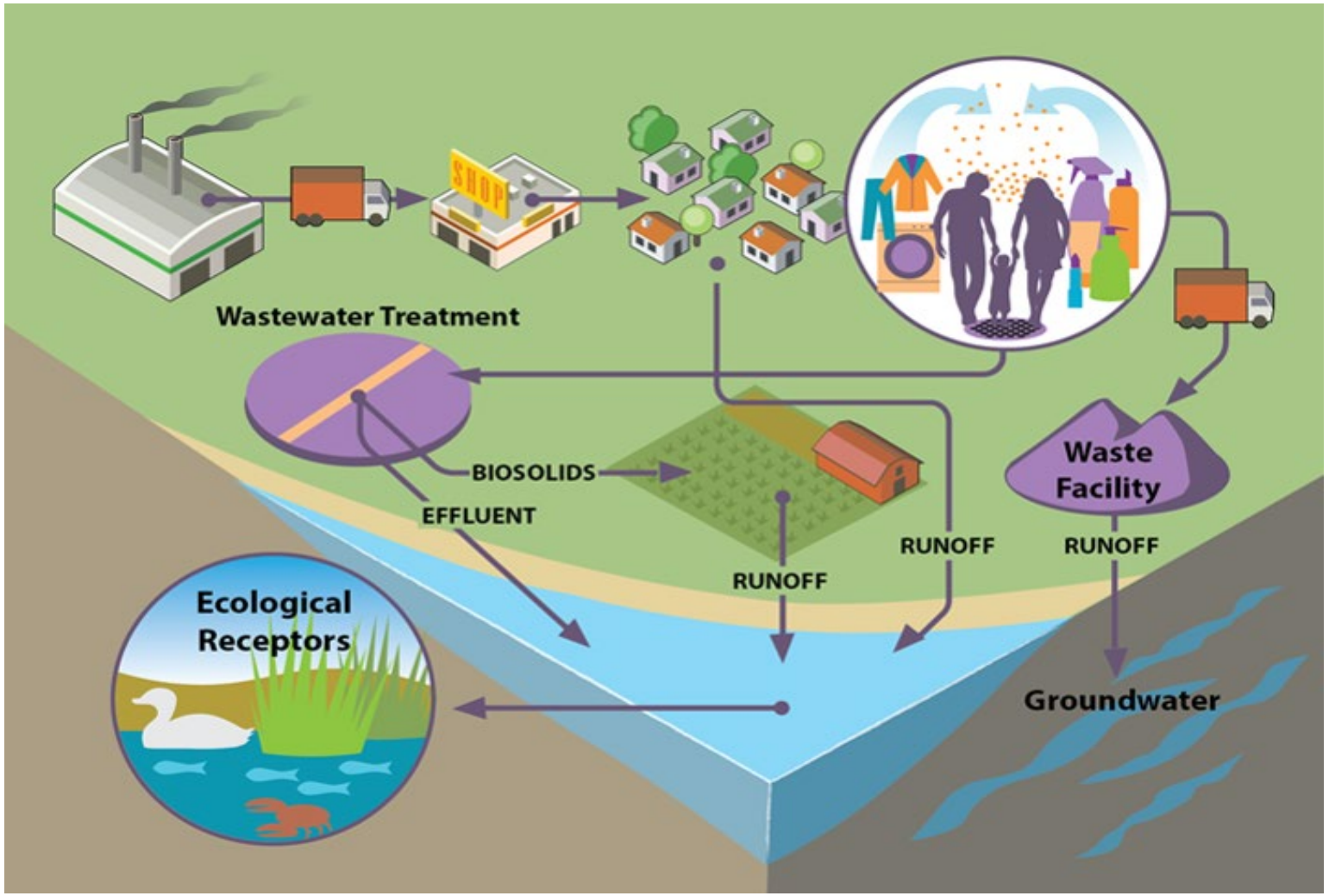
- Conceptual Model
  - Graphical representation of exposure source and receptors
  - Identify exposure pathways
    - Fate and transport
    - Exposure routes
    - Potential receptors

Conceptual Model – Exposure Pathways



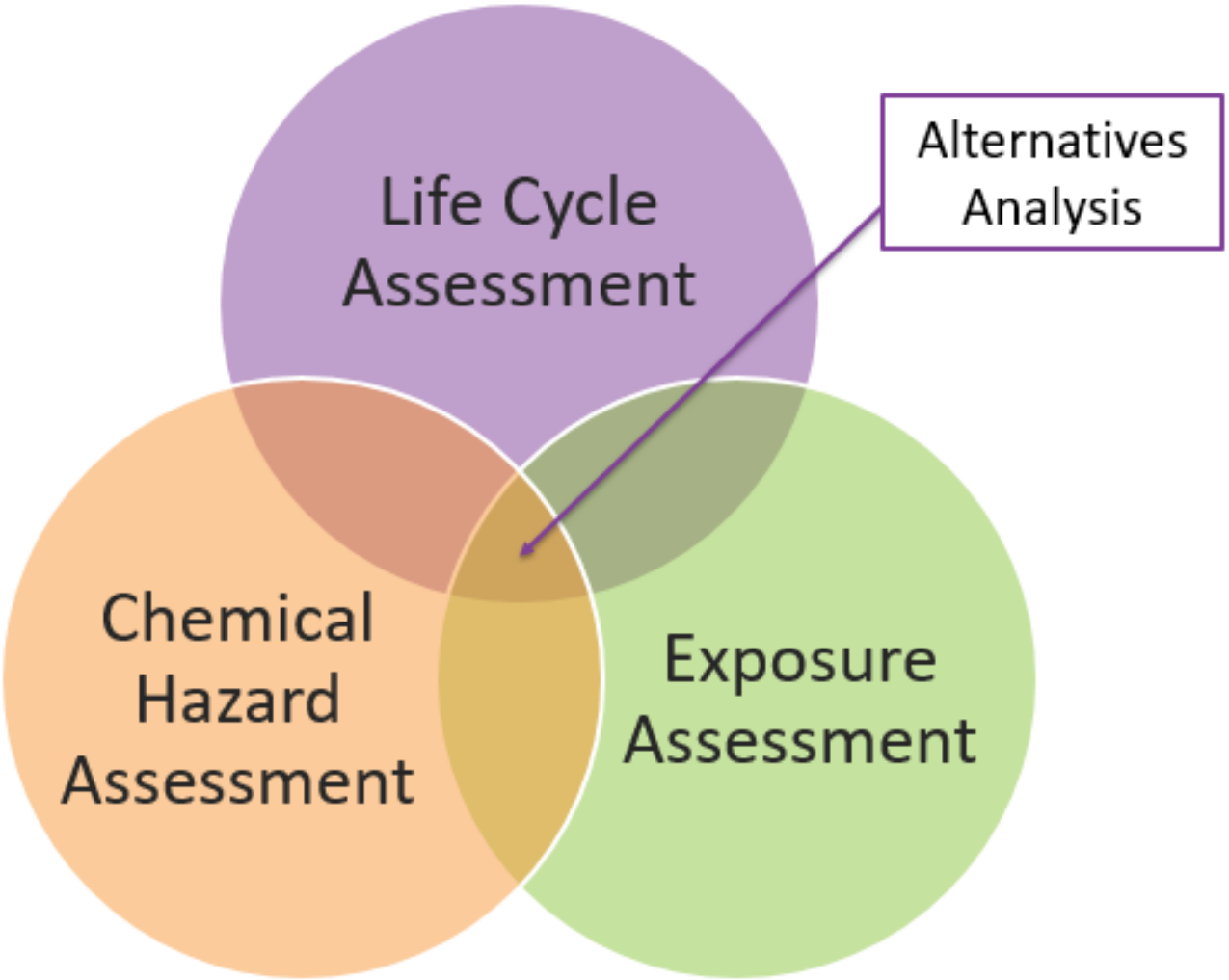
Exposure Route	Receptor			
	Human		Ecological	
	Consumer	Workers	Terrestrial	Aquatic
Ingestion	●	●	●	●
Inhalation	●	●	●	
Dermal	●	●	●	
Inhalation	●	●	●	
Ingestion			●	●
Inhalation				
Dermal	●	●	●	●
Ingestion	●	●		
Inhalation	●	●		
Dermal	●	●		
Ingestion	●			
Inhalation	●			
Dermal	●			
Ingestion	●	●	●	●
Inhalation	●	●	●	●
Dermal	●	●	●	●

Conceptual Model - Life Cycle Impacts



Addressing Information Challenges

- Unavailability of comprehensive data sets
  - Toxicological data, especially ecological hazards
  - Exposure data
  - Product ingredient and chemical quantity information
  - Life cycle inventory data
  - Public health and environmental costs
- Quality of data
- Temporal and spatial information
- Ways to address data gaps
- Reliability and robustness in regulatory context


Life Cycle Assessment
Alternatives Analysis
Chemical Hazard Assessment
Exposure Assessment

Thank you!

Questions or comment?
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