SMARTER SORTING

The Paradox of Overclassification and Animal Testing

*Cliff notes on the California LC50 Test, what it means for retailers and brands—**and what's happening to change an outdated approach***

May 18, 2022

California Aquatox

01 Background and introduction to the LC50 test

02 How is this measured?

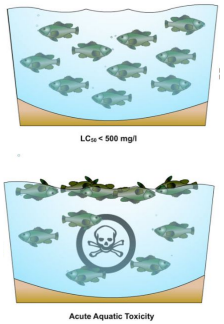
03 Why does this matter?

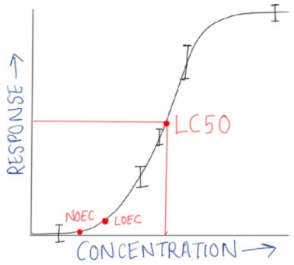
04 What can be done?

Overclassification

Unnecessary testing

1. **Background** and introduction





Waste is hazardous by aquatic toxicity[1] if a 96-hour LC_{50} is less than 500 mg/liter.

96-hour LC_{50} < 500 mg/l = acute aquatic toxicity

1. Background and introduction

22 CCR § 66261.24. Characteristic of Toxicity.

	Oral	Dermal	Inhalation	Aquatic
Threshold	2.5 g / kg	4.3 g / kg	10k ppm	0.5. g /kg
Calculation okay?	Y	Y	Y	**N**

Is it hazardous waste or isn't it?

If my waste is a detergent or soap and I have results that show it only fails the aquatic toxicity test, can I ignore those results and handle it as nonhazardous waste?

There is no waiver or exclusion from the aquatic toxicity testing requirement, nor is there any rule or regulation that allows a generator to ignore a result obtained from performing the aquatic fish bioassay test.

If you have aquatic toxicity test results from your waste detergent or soap that shows

2. **How** is this measured today?

Static Acute Bioassay a.k.a. *“Fish kill test”*

“Ten fish are then added to each test tank and monitored for 96 hours. Water quality parameters, such as dissolved oxygen, pH, and temperature and mortalities are recorded daily. The final fish survival rate is used to determine whether or not the sample passes state criteria for non-hazardous waste, namely an LC50 greater than 500 mg/l (in other words, the concentration necessary to kill half of the exposed fish must be greater than 500 mg/1)”

3. Why does this matter? Consumer choice and demand

Cruelty Free INTERNATIONAL

cruelty free and vegan

NOT TESTED ON ANIMALS

=

3. Why does this matter? Cost of testing & the cost of over classification

A compliance framework not designed for retailers.

A. The cost of testing

Exhibit 4-4. Summary of WET Test Costs

Test Method and Species	Multiple-Concentration N	Multiple-Concentration Range (2016 $)	Multiple-Concentration Average (2016 $)	Single-Concentration N	Single-Concentration Range (2016 $)	Single-Concentration Average (2016 $)
Acute						
EPA Method 2000.0 - *Cyprinodon variegatus*	2	$389 - $431	$410	4	$273 - $442	$347
EPA Method 2000.0 - *Oncorhynchus mykiss*	2	$389 - $431	$410	4	$273 - $442	$347
EPA Method 2000.0 - *Pimephales promelas*	11	$237 - $841	$554	19	$189 - $631	$370
EPA Method 2002.0 - *Ceriodaphnia dubia*	9	$289 - $841	$621	12	$189 - $631	$391
EPA Method 2004.0 - *Cyprinodon variegatus*	3	$526 - $789	$701	1	$315	$315
EPA Method 2006.0 - *Menidia beryllina*	6	$410 - $894	$721	4	$205 - $670	$442
EPA Method 2006.0 - *Menidia*	2	$789	$789	0	ND	ND
EPA Method 2006.0 - *Menidia peninsulae*	2	$789	$789	0	ND	ND
EPA Method 2007.0 - *Mysidopsis bahia*	5	$526 - $815	$710	3	$315 - $526	$403
EPA Method 2019.0 - *Oncorhynchus mykiss*	5	$421 - $1,008	$748	11	$273 - $473	$407
EPA Method 2019.0 - *Salvelinus fontinalis*	2	$789	$789		ND	ND
EPA Method 2021.0 - *Daphnia magna*	2	$473 - $789	$631	8	$263 - $591	$422
EPA Method 2021.0 - *Daphnia pulex*	1	$946	$946	1	$710	$710
N/A - *Atherinops affinis*	4	$415 - $894	$689	4	$210 - $670	$444
N/A - *Holmesimysis costata*	2	$789	$789		ND	ND

B. Toxic = hazardous = more costs

- Special waste management / handling fees
- Chargebacks
- Reduced recyclability
- Extra regulatory responsibility

C. Regulatory burden

- Your product is now “in scope” for all regulatory obligations e.g. reporting, training, handling
- Compliance risk i.e. exposure x potential hazard increases significantly

4. What can be done? Calculating aquatic toxicity

What if I told you that you do not have to kill fish to determine aquatic toxicity?

4. What can be done? Calculating aquatic toxicity

Washington "book designation"

TOXIC CATEGORY TABLE

Toxic Category	Fish LC_{50}(mg/L)[b]	Oral Rat LD_{50}(mg/kg)	Inhalation Rat LC_{50}(mg/L)[c]	Dermal Rabbit LD_{50}(mg/kg)
X	<0.01	<0.5	<0.02	<2
A	0.01 - <0.1	0.5 - <5	0.02 - <0.2	2 - <20
B	0.1 - <1	5 - <50	0.2 - <2	20 - <200
C	1 - <10	50 - <500	2 - <20	200 - <2000
D	10 - 100	500 - 5000	20 - 200	2000 - 20,000

a These four test endpoints are defined in WAC 173-303-040.

b Fish LC_{50} data must be derived from an exposure period greater than or equal to twenty-four hours. A hierarchy of species LC_{50} data should be used that includes (in decreasing order of preference) salmonids, fathead minnows, and other fish species.

c Inhalation Rat LC_{50} data must be derived from an exposure period greater than or equal to one hour.

$$\text{Equivalent Concentration (\%)} = \frac{\sum X\%}{1} + \frac{\sum A\%}{10} + \frac{\sum B\%}{100} + \frac{\sum C\%}{1000} + \frac{\sum D\%}{10{,}000}$$

EU Technical Guidance for HP 14 Ecotoxic

Summation Method (mixtures)

Sum of the concentrations (in %) of ingredients classified as:	Mixture is classified as:
Acute 1 x M-factor ≥ 25%	Acute 1

Additivity Method (sub-mixtures)

$$\frac{\sum Ci}{L(E)C_{50_m}} = \sum_n \frac{Ci}{L(E)C_{50_i}}$$

where:

C_i = concentration of ingredient i (weight percentage);

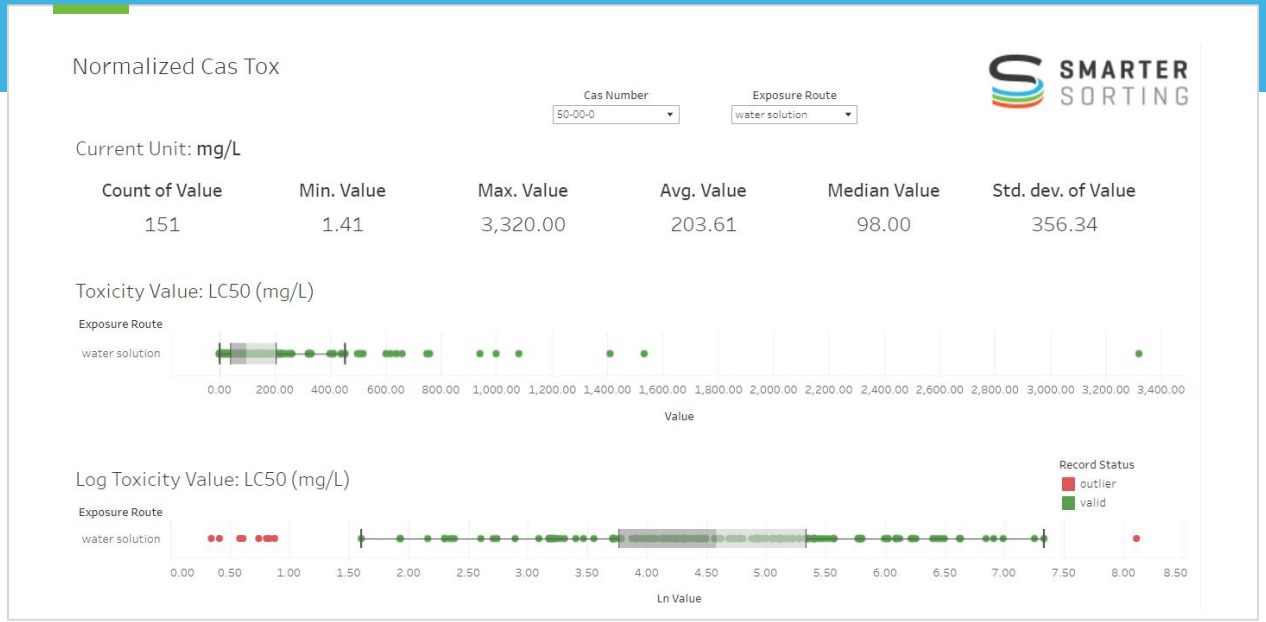
$L(E)C_{50}$ = LC_{50} or EC_{50} for ingredient i, in (mg/l);

n = number of ingredients, and i is running from 1 to n;

$L(E)C_{50_m}$ = $L(E)C_{50}$ of the part of the mixture with test data;

4. What can stakeholders do? Computational decision-making

Classify using computational mechanisms to deliver accurate California waste classifications



4. What can stakeholders do? Growing & increasing support

Smarter Sorting + National Stewardship Action Council + California State Assembly + Retailers + Physicians Committee for Responsible Medicine

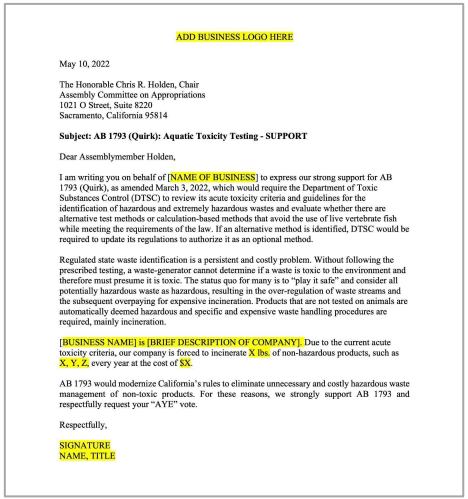
Technical guidance on the current regulations, highlighting opportunities to adopt frameworks from other authorities, providing data and research to support a computational approach to aquatic toxicity.

Passed through a vote on March 08, SB 1739 Committee on Environmental Safety and Toxic Materials

NSAC
NATIONAL STEWARDSHIP ACTION COUNCIL
ADVOCATING FOR A CIRCULAR & EQUITABLE ECONOMY

Assembly Member Bill Quirk, Chair of the Environmental Safety and Toxic Materials Committee

4. What can stakeholders do?



ADD BUSINESS LOGO HERE

May 10, 2022

The Honorable Chris R. Holden, Chair
Assembly Committee on Appropriations
1021 O Street, Suite 8220
Sacramento, California 95814

Subject: AB 1793 (Quirk): Aquatic Toxicity Testing - SUPPORT

Dear Assemblymember Holden,

I am writing you on behalf of [NAME OF BUSINESS] to express our strong support for AB 1793 (Quirk), as amended March 3, 2022, which would require the Department of Toxic Substances Control (DTSC) to review its acute toxicity criteria and guidelines for the identification of hazardous and extremely hazardous wastes and evaluate whether there are alternative test methods or calculation-based methods that avoid the use of live vertebrate fish while meeting the requirements of the law. If an alternative method is identified, DTSC would be required to update its regulations to authorize it as an optional method.

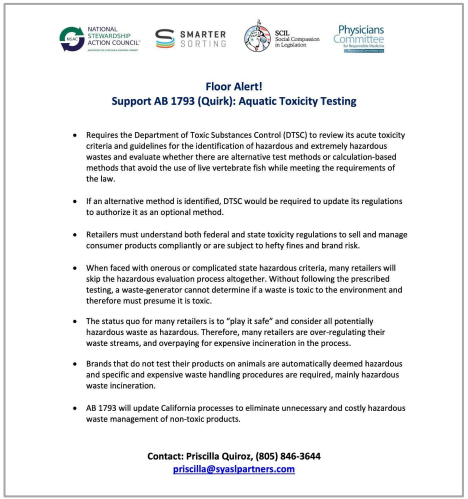
Regulated state waste identification is a persistent and costly problem. Without following the prescribed testing, a waste-generator cannot determine if a waste is toxic to the environment and therefore must presume it is toxic. The status quo for many is to "play it safe" and consider all potentially hazardous waste as hazardous, resulting in the over-regulation of waste streams and the subsequent overpaying for expensive incineration. Products that are not tested on animals are automatically deemed hazardous and specific and expensive waste handling procedures are required, mainly incineration.

[BUSINESS NAME] is [BRIEF DESCRIPTION OF COMPANY]. Due to the current acute toxicity criteria, our company is forced to incinerate X lbs. of non-hazardous products, such as X, Y, Z, every year at the cost of $X.

AB 1793 would modernize California's rules to eliminate unnecessary and costly hazardous waste management of non-toxic products. For these reasons, we strongly support AB 1793 and respectfully request your "AYE" vote.

Respectfully,

SIGNATURE
NAME, TITLE

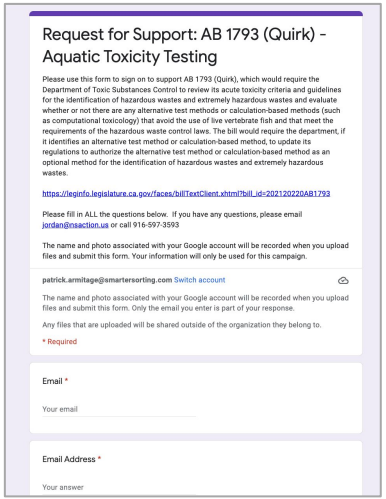


NATIONAL STEWARDSHIP ACTION COUNCIL · SMARTER SORTING · SCIL Social Compassion in Legislation · Physicians Committee for Responsible Medicine

Floor Alert!
Support AB 1793 (Quirk): Aquatic Toxicity Testing

- Requires the Department of Toxic Substances Control (DTSC) to review its acute toxicity criteria and guidelines for the identification of hazardous and extremely hazardous wastes and evaluate whether there are alternative test methods or calculation-based methods that avoid the use of live vertebrate fish while meeting the requirements of the law.
- If an alternative method is identified, DTSC would be required to update its regulations to authorize it as an optional method.
- Retailers must understand both federal and state toxicity regulations to sell and manage consumer products compliantly or are subject to hefty fines and brand risk.
- When faced with onerous or complicated state hazardous criteria, many retailers will skip the hazardous evaluation process altogether. Without following the prescribed testing, a waste-generator cannot determine if a waste is toxic to the environment and therefore must presume it is toxic.
- The status quo for many retailers is to "play it safe" and consider all potentially hazardous waste as hazardous. Therefore, many retailers are over-regulating their waste streams, and overpaying for expensive incineration in the process.
- Brands that do not test their products on animals are automatically deemed hazardous and specific and expensive waste handling procedures are required, mainly hazardous waste incineration.
- AB 1793 will update California processes to eliminate unnecessary and costly hazardous waste management of non-toxic products.

Contact: Priscilla Quiroz, (805) 846-3644
priscilla@syaslpartners.com



Request for Support: AB 1793 (Quirk) - Aquatic Toxicity Testing

Please use this form to sign on to support AB 1793 (Quirk), which would require the Department of Toxic Substances Control to review its acute toxicity criteria and guidelines for the identification of hazardous wastes and extremely hazardous wastes and evaluate whether or not there are any alternative test methods or calculation-based methods (such as computational toxicology) that avoid the use of live vertebrate fish and that meet the requirements of the hazardous waste control laws. The bill would require the department, if it identifies an alternative test method or calculation-based method, to update its regulations to authorize the alternative test method or calculation-based method as an optional method for the identification of hazardous wastes and extremely hazardous wastes.

https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB1793

Please fill in ALL the questions below. If you have any questions, please email jordan@nsaction.us or call 916-597-3593

The name and photo associated with your Google account will be recorded when you upload files and submit this form. Your information will only be used for this campaign.

patrick.armitage@smartersorting.com Switch account

The name and photo associated with your Google account will be recorded when you upload files and submit this form. Only the email you enter is part of your response.

Any files that are uploaded will be shared outside of the organization they belong to.

* Required

Email *

Your email

Email Address *

Your answer

Two actions:

1. **Use and submit the letter template**
2. **Sign the Floor Alert**

Overall support the efforts of bill sponsors (NSAC) in assuring DTSC staff (technical, legislative, and board) that computational toxicity works

Make sure the committee hears from retailers

Sign the petition, link to form:
https://docs.google.com/forms/d/e/1FAIpQLSelM8Wt_Qi4RbxUrB7pvOtZC5Aal1AldUL00QFEl4KwXrxfVA/viewform

Questions and follow ups

AJ Kenny

Director of Regulations
Smarter Sorting

aj@smartersorting.com

NSAC Team

The team at the
National Stewardship Action Council

Heidi Sanborn, Executive Director
Jordan Wells, Advocacy Director