

# California Hazardous Waste Classification

February 2024  
Geoff Knight

**Yorke**  
ENGINEERING, LLC  
www.YorkeEngr.com  
Specializing in Air Quality  
and EH&S Services

© Copyright 2024, Yorke Engineering, LLC

1

## Yorke Engineering, LLC

- Yorke assists Industrial and Government clients with environmental, air quality, and safety/industrial hygiene (IH) regulations issued by the local, state, and federal agencies
- Founded in 1996 and has worked for over 1,800 customers at well over 3,000 facilities
- Over 10,000 air, water, waste, and safety/IH projects completed



**Yorke**  
ENGINEERING, LLC  
www.YorkeEngr.com

2

© Copyright 2024, Yorke Engineering, LLC

2

## Geoff Knight



- Over 30 years experience providing variety of environmental compliance, permitting, and management systems development to industry and government
- Many years doing hazardous waste characterization and management in California (plus WA, MA, NY, and numerous other states)
- DTSC-approved Violation Scoring Procedure (VSP) auditor for California-permitted TSDFs
- Developed sampling plans and performed field sample collection at RCRA Corrective Action, NPL, UST, and many other contaminated sites



3

© Copyright 2024, Yorke Engineering, LLC

3

## Agenda



- **Hazardous Waste Regulatory Framework**
- Waste Classification – Listed Wastes
- Waste Classification – Characteristic Wastes
- Understanding Laboratory Data
- Waste Characterization vs. Waste Profiling
- Examples of Non-RCRA (California-only) Hazardous Wastes



4

© Copyright 2024, Yorke Engineering, LLC

4

## Regulatory Framework – Federal

- Resource Conservation and Recovery Act (RCRA) – law passed by Congress in 1976 that created the federal hazardous waste control system
- Hazardous waste regulations based on RCRA were developed by the U.S. EPA and have been through several major updates
- 40 CFR Parts 260-279
- RCRA (the underlying law) does not play a role in most hazardous waste generator activity

5

## Regulatory Framework – California

- California's Hazardous Waste Control Act passed in 1972 – was the model for federal RCRA
- Cal/EPA Department of Toxic Substances Control (DTSC) develops California's hazardous waste regulations – 22 CCR Division 4.5
- Unlike federal system, several California hazardous waste requirements are not in 22 CCR regulations – they appear only in Health & Safety Code (H&SC) Division 20, Chapter 6.5

6

# Regulatory Framework

- H&SC Division 20 contains waste classification exclusions and exemptions – an essential reference
- California’s Unified Program grants authority to local Certified Unified Program Agencies (CUPAs) to adopt requirements stricter than the State standards
- Yorke is not aware of any waste classification differences at the local level... yet

7

# Regulatory Framework

## § 66261.9. Requirements for Universal Waste.

### Currentness

(a) The hazardous wastes listed in this section are exempt from the management requirements of chapter 6.5 of division 20 of the Health and Safety Code and its implementing regulations except as specified in chapter 23 and, therefore, are not fully regulated as hazardous wastes. The wastes listed in this section are subject to regulation pursuant to chapter 23 and shall be known as "universal wastes."

- (1) Batteries, as described in section 66273.2, subsection (a);
- (2) Electronic devices, as described in section 66273.3, subsection (a);
- (3) Mercury-containing equipment, as described in section 66273.4, subsection (a);
- (4) Lamps, as described in section 66273.5, subsection (a) (including, but not limited to, M003 wastes);
- (5) Cathode ray tubes, as described in section 66273.6, subsection (a);
- (6) Cathode ray tube glass, as described in section 66273.7, subsection (a);
- (7) Aerosol cans, as specified in Health and Safety Code section 25201.16 and
- (8) Photovoltaic modules, as described in section 66273.7.1, subsection (a).

(b) Unless specified otherwise in section 66273.60, universal wastes shall be managed as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division upon arrival at a destination facility.

8

# Agenda



- Hazardous Waste Regulatory Framework
- **Waste Classification – Listed Wastes**
- Waste Classification – Characteristic Wastes
- Understanding Laboratory Data
- Waste Characterization vs. Waste Profiling
- Examples of Non-RCRA (California-only) Hazardous Wastes

9

# Waste Classification – First Question: Is It a Waste?

- Materials that are “discarded” by being placed in a dumpster, sent to landfill, discharged to sewer, etc., or recycled or incinerated
- Materials that are expired or otherwise have no clear further use
- Materials accumulated, stored, or treated before being discarded
- Materials that pose a threat and are not clearly labeled or are stored in a deteriorated or damaged container

10

## Waste Classification – What is a Hazardous Waste?

- Broadly, a hazardous waste is a liquid, sludge, solid, or gas that:
  - Exhibits one or more hazardous characteristics;
  - or**
  - Is specifically listed in the regulations



11

## Waste Classification – Listed Wastes

- “Listed” wastes are hazardous no matter what they do or do not contain
- Three categories:
  - Non-specific sources: e.g., spent degreasing solvents, cyanide metal plating solutions
  - Specific sources: wastes from specified industrial processes, such as chlorine production
  - Waste commercial chemical products, off-specification products, container and spill residues

12

## Waste Classification – Listed Wastes

- Really no way to identify whether you have a listed waste other than reading the regulations at 40 CFR Part 261 Subpart D
- The California and federal lists are identical with only one exception – California has an “M-list,” which includes mercury-containing fluorescent light bulbs and some other mercury-containing devices

13

## Waste Classification – Listed Wastes

F001 The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures

K169 Crude oil storage tank sediment from petroleum refining operations

Hazardous waste No.	Chemical abstracts No.	Substance
U394	30558-43-1	A2213.
U001	75-07-0	Acetaldehyde (l)

14

## A Note on Waste Codes

- All RCRA hazardous wastes assigned a “Waste Number [code]” consisting of a letter and three numbers
  - Example: “F-list” wastes are non-specific source wastes, e.g., F001/F002 are spent halogenated solvents (TCE, PCE, etc.)
- California assigns a three-number State waste code to any hazardous waste generated in California, which is based on a description of the waste, plus, in some cases, an analytical characteristic (e.g., pH)

## A Note on Waste Codes (Cont.)

- These codes are used on hazardous waste manifests (and for biannual reporting purposes and SB14 documents, if applicable to the site)
- A federally regulated waste is a “RCRA hazardous waste” and will carry both a RCRA waste number [code] AND a California waste code
- A waste that is only hazardous in California is a “non-RCRA hazardous waste”
  - A non-RCRA waste will ONLY carry a California waste code



# Agenda



- Hazardous Waste Regulatory Framework
- Waste Classification – Listed Wastes
- **Waste Classification – Characteristic Wastes**
- Understanding Laboratory Data
- Waste Characterization vs. Waste Profiling
- Examples of Non-RCRA (California-only) Hazardous Wastes

17

# Waste Classification – Characteristic Wastes

- Hazardous waste characteristics:

- **Ignitability**
- Corrosivity
- **Reactivity**
- **Toxicity**



- Any one or combination will designate the waste as hazardous

18

# Waste Classification



## ■ Ignitability

- Liquids with a flash point of 140°F or less
  - Waste fuels, solvents, paints, etc.
- Non-liquids capable of causing fire through friction, absorption of moisture, or spontaneous chemical changes that burn vigorously and persistently (e.g., magnesium, lithium)
- Ignitable compressed gas (e.g., acetylene)
- Oxidizer (e.g., ammonium nitrate)

19

# Ignitability



## ■ Ignitability has one important exclusion:

(a) A waste exhibits the characteristic of ignitability if representative samples of the waste have any of the following properties:

(1) it is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume, and has a flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (incorporated by reference, see section 66260.11), or a Setafash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78 (incorporated by reference, see section 66260.11), or as determined by an equivalent test method approved by the Department pursuant to section 66260.21;

- The most common application of this is ethanol, e.g., spirits less than 48 proof...
- But alcohols also include isopropyl alcohol, methanol, and others.

20

## Ignitability



### ■ Q: Is hand sanitizer a hazardous waste?

*The Centers for Disease Control and Prevention recommends formulations containing 80% (percent volume/volume) ethanol or 75% isopropyl alcohol; however, generally speaking, sanitizers containing 60 to 95% alcohol are acceptable. The recommended percentages of ethanol and isopropyl alcohol are kept as 80% and 75% because these values lie in the middle of the acceptable range.*

*(<https://pubmed.ncbi.nlm.nih.gov/30020626/>)*

### ■ A: Very likely, yes (when, and if, it becomes a waste...)

## Waste Classification



### ■ Corrosivity

- Aqueous with a pH  $\leq 2$  or  $\geq 12.5$
- Liquid that corrodes steel at a rate greater than 0.250 inch/year (e.g., etchants)

### ■ California Only!

Solid/non-aqueous waste that, when mixed with an equivalent weight of water, produces a corrosive solution as above

## Waste Classification



### ■ Reactivity

- Normally unstable and readily undergoes violent change without detonation
- Reacts violently with water (H<sub>2</sub>O reactive)
- Capable of detonation or explosive reaction if subject to source of ignition or heat
- Can generate toxic gases or fumes (e.g., H<sub>2</sub>S or cyanides) when mixed with water
- Organic peroxides
- There is no analytical test for reactivity!

23

## Toxicity Criteria “Handout”

- Toxicity Criteria PDF summarizes the differences between the federal and California regulated chemicals and toxicity characteristic thresholds
- Scan the QR code for a copy



24

CALIFORNIA AND FEDERAL HAZARDOUS WASTE TOXICITY CRITERIA



RCRA Hazardous				Calif. Hazardous				RCRA Hazardous				Calif. Hazardous				
Compound	EPA #	TCLP (mg/L)	STLC (mg/L)	TCLP (mg/L)	STLC (mg/L)	TTLC (mg/kg)	Compound	EPA #	TCLP (mg/L)	STLC (mg/L)	TTLC (mg/kg)	Compound	EPA #	TCLP (mg/L)	STLC (mg/L)	TTLC (mg/kg)
Aldrin	--	--	0.14	--	1	--	Hexachloroethane	D034	3	--	--	--	--	--	--	--
Antimony	--	--	15	500	--	--	Kepon	--	--	2.1	21	--	--	--	--	--
Arsenic	D004	5	5	500	--	--	Lead	D008	5	5	1,000	--	--	--	--	--
Asbestos	--	--	n/a	1.0%	--	--	Lead (organic compounds)	--	--	n/a	13	--	--	--	--	--
Barium	D005	100	100	10,000	--	--	Lindane	D013	0.4	0.4	4	--	--	--	--	--
Benzene	D018	0.5	--	--	--	--	m-Cresol	D024	200	--	--	--	--	--	--	--
Beryllium	--	--	0.75	75	--	--	Mercury	D009	0.2	0.2	20	--	--	--	--	--
Cadmium	D006	1	1	100	--	--	Methoxychlor	D014	10	10	100	--	--	--	--	--
Carbon Tetrachloride	D019	0.5	--	--	--	--	Methyl ethyl ketone	D035	200	--	--	--	--	--	--	--
Chlordane	D020	0.03	0.25	3	--	--	Mirex	--	--	2.1	21	--	--	--	--	--
Chlorobenzene	D021	100	--	--	--	--	Molybdenum	--	--	350	3,500	--	--	--	--	--
Chloroform	D022	6	--	--	--	--	Nickel	--	--	20	2,000	--	--	--	--	--
Chromium	D007	5	560	2,500	--	--	Nitrobenzene	D036	2	--	--	--	--	--	--	--
Chromium VI	--	--	5	500	--	--	o-Cresol	D023	200	--	--	--	--	--	--	--
Cobalt	--	--	80	8,000	--	--	p-Cresol	D025	200	--	--	--	--	--	--	--
Copper	--	--	25	2,500	--	--	Pentachlorophenol	D037	100	1.7	17	--	--	--	--	--
Cresol	D026	200	--	--	--	--	Polychlorinated Biphenyls (PCBs)	--	--	5	50	--	--	--	--	--
DDT, DDE, DDD	--	--	0.1	1	--	--	Pyridine	D038	5	--	--	--	--	--	--	--
1,1-Dichloroethylene	D029	0.7	--	--	--	--	Selenium	D010	1	1	100	--	--	--	--	--
1,2-Dichloroethane	D028	0.5	--	--	--	--	Silver	D011	5	5	500	--	--	--	--	--
1,4-Dichlorobenzene	D027	7.5	--	--	--	--	Tetrachloroethylene	D039	0.7	--	--	--	--	--	--	--
2,4-D (2,4-Dichlorophenoxyacetic acid)	D016	10	10	100	--	--	Thallium	--	--	7	700	--	--	--	--	--
Dieldrin	--	--	0.8	8	--	--	Toxaphene	D015	0.5	0.5	50	--	--	--	--	--
2,4-Dinitrotoluene	D030	0.13	--	--	--	--	2,4,5-TP (Silvex)	D017	1	--	--	--	--	--	--	--
Dioxin (2,3,7,8-TCDD)	--	--	0.001	0.01	--	--	Trichloroethylene	D040	0.5	204	2,040	--	--	--	--	--
Endrin	D012	0.02	0.02	0.20	--	--	2,4,5-Trichloro-phenoxypropionic acid	--	--	1	10	--	--	--	--	--
Fluoride	--	--	180	18,000	--	--	2,4,6-Trichlorophenol	D041	400	--	--	--	--	--	--	--
Heptachlor	D031	0.008	0.47	5	--	--	2,4,6-Trichlorophenol	D042	2	--	--	--	--	--	--	--
Hexachlorobenzene	D032	0.13	--	--	--	--	Vanadium	--	--	24	2,400	--	--	--	--	--
Hexachlorobutadiene	D033	0.5	--	--	--	--	Vinyl Chloride	D043	0.2	--	--	--	--	--	--	--
							Zinc	--	--	250	5,000	--	--	--	--	--

NOTES:

- For liquid with low solids TTLC = TCLP = STLC
- If TTLC ≥ 20 x TCLP value, run TCLP test for that constituent
- If TTLC ≥ 10 x STLC value, run STLC test for that constituent
- Both may be needed - a CA haz waste must not be a RCRA haz waste
- Don't forget to run fish bioassay if needed to confirm non-hazardous

For Info or Hazardous Waste Support Call:

Northern CA  
Michael Dudasko  
MDudasko@YorkeEngr.com  
(M) 510-859-6035

Southern CA  
Geoff Knight  
GKnight@YorkeEngr.com  
(M) 949-324-2728

25

## Waste Classification



### ■ Toxicity – Federal: **Simple!**

- A “TC” waste is a waste that, when tested by the Toxicity Characteristic Leaching Procedure (TCLP) test, exceeds a designated concentration in mg/L for one of 43 chemicals (metals and organics)
- Concentrations are specified in 40 CFR 261.24



26

© Copyright 2024, Yorke Engineering, LLC

26

# California Toxicity Criteria



- Toxicity – California: **Not Simple**
  - Two sets of California thresholds:
    1. Total Threshold Limit Concentration (TTLC) values based on total mg/kg of a chemical
    2. Soluble Threshold Limit Concentration (STLC) values (mg/L) based on California **WET** test (not the federal TCLP)
  - California regulates more chemicals – for example, the “RCRA 8” metals vs. the “CAM 17” in CA
  - Also a test for aquatic toxicity – the “fish kill test”

# Case Study: Fred’s Waste Testing

Compound	RCRA Hazardous		Calif. Hazardous	
	EPA #	TCLP (mg/L)	STLC (mg/L)	TTLC (mg/kg)
Hexachloroethane	D034	3	--	--
Kepon	--	--	2.1	21
Lead	D008	5	5	1,000

Fred has a solid material he suspects could be hazardous. He tests for total lead and the lab reports a result of **1,200 mg/kg**.

Fred classifies his waste as a Non-RCRA hazardous waste because the result exceeds the TTLC limit.



*Is Fred correct?*

# The Dilution Rule

**We use the Dilution Rule** to evaluate the need to run the WET or TCLP leaching tests on a solid/sludge:

- Basically to avoid unnecessary testing and associated cost. Not directly in the regulations, but an inherent element of the test methods.
- Is any total concentration **>20x** a TC (federal) value?
  - If yes, must run TCLP test and compare results to the TC values
- Is any total concentration **>10x** STLC (California) value, but below the TTLC threshold?



If yes, run WET test and compare to STLC values

# Is Fred Correct?



Compound	RCRA Hazardous		Calif. Hazardous	
	EPA #	TCLP (mg/L)	STLC (mg/L)	TTLC (mg/kg)
Hexachloroethane	D034	3	--	--
Kepone	--	--	2.1	21
Lead	D008	5	5	1,000

**He's not incorrect – but is he *fully* correct?**

- Does Fred know the waste does not contain hexachloroethane or kepone? How?
- Why did he not run the California WET test?
- Has Fred determined whether the waste is federally regulated? (...TCLP dilution rule of thumb)



# Say What Fred?



Compound	RCRA Hazardous		Calif. Hazardous	
	EPA #	TCLP (mg/L)	STLC (mg/L)	TTLC (mg/kg)
Hexachloroethane	D034	3	--	--
Kepone	--	--	2.1	21
Lead	D008	5	5	1,000

Let's say the waste contains only 75 mg/kg total lead:

Is more testing needed?

# Waste Classification

- Also not that simple
  - Federal and California exclusions and exemptions (e.g., scrap metal, petroleum exploration and production wastes, mining wastes, geothermal wastes)
  - Materials recycled on-site may be exempt
  - Point of waste generation is very important and sometimes difficult to determine



## Generator Knowledge

- Generator knowledge is an acceptable method of waste classification under the federal/State regulations
- Can you use generator knowledge to say something is not hazardous?



33

## Generator Knowledge – When

- Best used to exclude some tests when there is a sound basis for not running them
  - Ignitability of a water solution (unless alcohol is >24%)
  - Reactivity on most materials
  - Corrosivity on most organic waste streams
  - Organics in a corrosive waste stream
  - Compounds like PCBs and pesticides normally present only in specific situations

34

## Generator Knowledge – When

- Can you use only generator knowledge to say something is not hazardous?
  - Regulations do not prohibit this – **BUT** you better be sure!
- How do you address acute fish toxicity based on generator knowledge?
  - Should have done enough tests previously
  - Found information in the literature

35

## Generator Knowledge – Appendix X

- 22 CCR Div. 4.5 Ch. 11 App. X contains:
  - A list of chemicals the State presumes will render a waste hazardous
  - A list of common waste names that are also presumed to be hazardous
- However, generator knowledge can still be used as the basis for making a hazardous/non-hazardous determination for these wastes

36

## Why Not Just Assume a Waste Is Hazardous?

### ■ Pros

- Avoids errors managing/disposing of hazardous wastes as non-hazardous
- Do not need to know waste classification details

### ■ Cons

- Increased disposal fees/taxes
- Increased compliance burden and more potential compliance issues

## General Waste Classification Procedure

- Is it actually a waste?
- Does it qualify for a federal or CA exclusion or exemption?
- Is it a listed waste?
- Is it a characteristic waste?



## Waste Characterization Process

1. Use generator knowledge to exclude, or test for, ignitability and corrosivity (including CA criteria)
2. Assess reactivity (no test)
3. Analyze waste for total concentrations of possibly present organics and metals listed in 22 CCR 66261.24 (both federal and CA lists)
  - Compare total concentrations to the CA TTLC values
  - If any concentration exceeds a TTLC value, you have at least a non-RCRA hazardous waste

39

## Waste Classification Tool

- DTSC has created an online waste training and classification tool:  
<https://dtsc.ca.gov/california-hazardous-waste-classification-training/>
- No tool is truly comprehensive – generator knowledge is almost always a large part
- Also see Appendix X as a suggestion that something may be hazardous

40

## Waste Classification Recordkeeping

- **Current requirement:** Keep records of any test results, waste analyses, or other determinations for at least 3 years
- **Future requirement:** Records must include, but are not limited to, results of any tests, sampling, waste analyses, or other determinations; records documenting the tests, sampling, and analytical methods used to demonstrate the validity and relevance of such tests; records consulted in order to determine the process by which the waste was generated, the composition of the waste, and the properties of the waste; and records that explain the basis for “generator knowledge”

## Agenda



- Hazardous Waste Regulatory Framework
- Waste Classification – Listed Wastes
- Waste Classification – Characteristic Wastes
- **Understanding Laboratory Data**
- Waste Characterization vs. Waste Profiling
- Examples of Non-RCRA (California-only) Hazardous Wastes

## Laboratory Services

- Waste sampling for characterization purposes can seem simple – “fill the bottle, fill out the Chain of Custody and read the lab report”
- Famous last words:
  - “My data collection plan? Get a sample and send it to the lab.”
  - “I got three lab quotes and picked the lowest one... what could be the difference in a lab?”
  - “A ten-page report for one page of results? What is all this stuff?”

43

## A Slightly Deeper Look at Lab Analysis of Waste Samples

- Waste characterization is like other environmental data collection – to be useful, the data needs to be:
  - Representative of the waste stream
  - Of sufficient quality (accurate and precise) to make risk-based decisions...
  - ...and, potentially, to withstand legal scrutiny

44

## Is My Data Going to be Representative?

- How many samples of a waste stream are needed to characterize it? One? Ten? More?
  - What is the waste volume – one drum versus 10 roll-off bins?
  - How variable is the waste stream over time and space?
  - What is the sample result variability – i.e., deviation from the mean?

## Is My Data Going to be Representative?

- A written sampling plan (either in advance or documented after) is a really good idea
- *Seriously? A sampling plan to stuff waste in a bottle?*
- If you are collecting environmental data and expect to ever need to defend the what/how/where/when/why – then you do
- What analyses? Where, when, how many collected? Detection limit? etc. etc.

## Is My Data Going to be Representative?

22 CCR Div. 4.5 Ch. 11 App. I

### Appendix I Representative Sampling Methods

The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. In addition to the sampling methods described in “**Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,**” SW-846, 3rd edition, 1986 (incorporated by reference, see Section 66260.11)

- This is the standard document for developing a representative waste characterization plan (and for standard methods of lab analyses too)

47

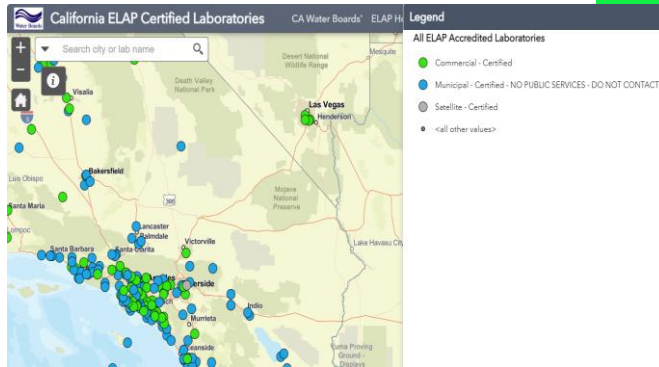
## Waste Characterization Sampling Plans

- What is the data use? Screening? Routine characterization? Enforcement or legal defense?
- What is the appropriate number of samples?
- What analytical methods will be used? Are the method detection limits (MDLs) appropriate for the regulatory criteria which the results will be compared to?
- Is the laboratory I intend to use certified by the State of California for the analyses to be performed?
- How will samples be collected and handled to ensure the results will “stand up in court”?

48



# Laboratory Selection



<https://waterboards.maps.arcgis.com/apps/webappviewer/index.html?id=bd0bd8b42b1944058244337bd2a4ebfa>

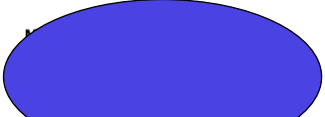
# What Does the Lab Report Say?

- The results are the key piece of information...
- But the rest of the report is what supports the numbers reported
- What were the sample receipt conditions?
- What were the method detection limits (MDL) versus the regulatory criteria?
- What was the Reporting Limit (RL) and do I have any results between the MDL and RL? What does that say about the waste?
- Were any data qualifiers reported?

# Understanding Laboratory Reports

## CERTIFICATE OF ANALYSIS

CLIENT:



REPORTING DATE: 02/16/2024

SAMPLE RECEIVED: 02/02/2024

LABORATORY NO.: 24-1275

DATE SAMPLED: 02/01/2024

CA STATE ELAP NO.: 2968

LACSD LAB I.D. NO.: 9249178

INVESTIGATION: SEE BELOW

PAGE: 1 OF 1

PROJECT CO:  
PROJECT NAME/NO.:  
CLIENT SAMPLE ID: 01024011, SP1  
MATRIX: Stormwater

Parameter	Result	Units	Reporting Limit	MDL	Method	Analyzed
pH (Field)	8.46	pH units	0.10	0.10	Field pH	02/01/24
Total Suspended Solids	5.00	mg/L	5.00	3.00	SM2540 D	02/07/24
Oil & Grease	ND	mg/L	5.00	5.00	EPA 1664A	02/13/24
Lead	1.65	µg/L	1.00	0.12	EPA 200.8	02/09/24
Zinc	46.3	µg/L	20.0	2.77	EPA 200.8	02/09/24

MDL: Method Detection Limit

ND: Parameter not detected at the indicated reporting limit.

EPA 200.8 was performed by partnership lab, CA ELAP No. 3082 & LACSD LAB I.D. 10109

ENGINEERING, LLC  
www.YorkeEngr.com

51

© Copyright 2024, Yorke Engineering, LLC

51

# Understanding Laboratory Reports



Environment Testing  
America

Client: Southern California Edison Company  
Project/Site: Kernville SIC

Laboratory Job ID: 570-80967

## ANALYTICAL REPORT

Eurofins Caliscience  
7440 Lincoln Way  
Garden Grove, CA 92841  
Tel: (714)895-5494

Laboratory No.: 80987-1  
Client: SIC

Company

Attn: Al Mamuro

Authorized for release by:  
1/21/2022 2:35:02 PM

Lori Thompson, Project Manager I  
(714)895-5494

Lon.Thompson@eurofinsnet.com

## Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Detection Summary	5
Client Sample Results	6
QC Sample Results	8
QC Association Summary	10
Lab Chronicle	11
Certification Summary	12
Method Summary	13
Sample Summary	14
Subcontract Data	15
Chain of Custody	18
Receipt Checklists	21

The test results in this report meet all 2003 NELAP, 2009 TML, and 2016 TML requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

ENGINEERING, LLC  
www.YorkeEngr.com

52

© Copyright 2024, Yorke Engineering, LLC

52

# Understanding Laboratory Reports

## Case Narrative

Job ID: 570-80987-1

Job ID: 570-80987-1

Laboratory: Eurofins Calscience

### Narrative

Job Narrative  
570-80987-1

### Comments

No additional comments.

### Receipt

The sample was received on 1/6/2022 4:35 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.5° C.

### Metals

Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision of Cobalt and Antimony for preparation batch 440-66424 and analytical batch 440-664645 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) was within acceptance limits

Method 6010B: The following sample was diluted due to the nature of the sample matrix: 010522-DSP097 (570-80987-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Lab Admin

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Subcontract Work

Method 96-Hr Acute Toxicity Bioassay: This method was subcontracted to Aquatic Testing Laboratories - Ventura, CA. The subcontract laboratory certification is different from that of the facility issuing the final report.



53

© Copyright 2024, Yorke Engineering, LLC

53

# Understanding Laboratory Reports

## FATHEAD MINNOW HAZARDOUS WASTE SCREEN BIOASSAY



Lab No.: A2201107-01

Client ID: ENSCV-570-80987-01

### TEST SUMMARY

Species: Pimephales promelas

Fish weight (gm): av: 0.67; min: 0.58; max: 0.82.

Reference Toxicant: SDS conducted monthly per source.

Test chamber volume: 10 liters.

Temperature: 29 +/- 2°C.

Aeration: none/minimum (>4.0 mg/l DO).

Number of replicates: 2.

Dilution water: Soft reconstituted water (40-48 mg/l CaCO<sub>3</sub>).

Source: Thomas P. 24

Regulations: CCR Title 22.

Test Protocol: California F&G/DHS 1988.

Endpoints: Survival at 96 hrs.

Test type: Static.

Feeding: None.

Number of fish per chamber: 10.

Photoperiod: 16/8 hrs light/dark.

### TEST DATA

Date/Time:	INITIAL				24 Hr				48 Hr				72 Hr				96 Hr			
	1-12-22	10M	1-12-22	10M	1-14-22	10M	1-15-22	10M	1-15-22	10M	1-17-22	10M	1-18-22	10M	1-18-22	10M	1-18-22	10M		
Analyst:	K.P.																			
Control A	19.6	7.5	7.8	19.6	6.0	7.1	0	20.0	7.0	7.9	0	19.9	7.0	7.6	0	20.0	7.0	7.5	0	
Control B	19.5	7.6	7.7	19.6	6.1	7.1	0	19.8	6.5	7.2	0	19.7	6.5	7.8	0	20.0	7.0	7.6	0	
400 mg/l A	19.5	7.3	7.6	19.6	5.0	6.7	0	20.0	5.0	6.9	0	20.0	7.1	7.1	0	19.8	6.9	7.1	0	
400 mg/l B	19.6	7.3	7.5	19.6	5.1	6.8	0	19.8	7.1	7.2	0	19.9	7.0	7.1	0	19.8	6.9	7.1	0	
750 mg/l A	19.5	7.4	7.6	19.6	5.2	6.8	0	19.8	5.9	7.1	0	19.8	7.2	7.2	0	19.9	6.6	7.0	0	
750 mg/l B	19.6	7.5	7.6	19.5	5.4	7.0	0	19.8	6.6	7.1	0	19.9	7.1	7.2	0	19.7	6.6	7.1	0	

Comments: Extraction method: Mechanical shaking  Dissolved Oxygen (DO) readings in mg/l O<sub>2</sub>.  
None (aqueous solution)   
Test Aeration: None  Aerated  (Minimum needed to maintain DO > 5.0 mg/l, through narrow bore glass tube at < 100 bubbles per minute)

	CONTROL		HIGH CONCENTRATION		Total Number Dead
	Alkalinity	Hardness	Alkalinity	Hardness	
Initial	32 mg/l CaCO <sub>3</sub>	45 mg/l CaCO <sub>3</sub>	36 mg/l CaCO <sub>3</sub>	45 mg/l CaCO <sub>3</sub>	Control 0 / 20 400 mg/l 0 / 20 750 mg/l 0 / 20
Final	33 mg/l CaCO <sub>3</sub>	45 mg/l CaCO <sub>3</sub>	33 mg/l CaCO <sub>3</sub>	48 mg/l CaCO <sub>3</sub>	

RESULT	
(the checked (✓) result applies based on fish survival rates of this test; NA - not applicable)	
<input checked="" type="checkbox"/>	LC50 > 750 mg/l (<40% dead in 750 mg/l conc.)
<input checked="" type="checkbox"/>	>40% dead in 750 mg/l (close to passing - definitive test recommended)
<input checked="" type="checkbox"/>	LC50 < 400 mg/l (>60% dead in 400 mg/l conc.)



© Copyright 2024, Yorke Engineering, LLC

Page 16 of 22

1/21/2022

54

# Agenda



- Hazardous Waste Regulatory Framework
- Waste Classification – Listed Wastes
- Waste Classification – Characteristic Wastes
- Understanding Laboratory Data
- **Waste Characterization vs. Waste Profiling**
- Examples of Non-RCRA (California-only) Hazardous Wastes

# Characterizing and Profiling Wastes

- Arranging for hazardous waste disposal will virtually always require working with the waste broker or disposal facility to develop a written “waste profile”
- The waste profile is your “ticket” to ship your waste to a disposal facility
- It is also their ticket to bill you for their services, so facilities are very eager to build (and have the generator sign) their waste profiles

## Waste Characterization vs. Waste Profiling

- Waste **characterization** and waste **profiling** are different but have much in common:
  - Both are undertaken by waste generators
  - Both address the federal and State hazardous waste regulatory concepts discussed above (i.e., waste listings and waste characteristics)
  - Both often rely on testing waste and comparing the results to the applicable regulatory criteria
- So... what's the difference?

## Waste Characterization vs. Waste Profiling

- The objective of waste **characterization** is to determine whether a particular waste is hazardous, or not, according to applicable regulatory criteria
  - For the waste generator, legal process
- The objective of waste **profiling** is to determine whether a particular waste can be accepted at a specific permitted facility
  - For the waste generator, a commercial process with legal risks

## Key Concepts – Characterization vs. Profiling

- Waste characterization is the legal responsibility of the waste generator

*66262.11. Hazardous Waste Determination.*

*A person who generates a waste, as defined in section 66261.2, shall determine if that waste is a hazardous waste...*

- Waste profiling is also a generator's legal responsibility in the sense that H&SC 25189.5(a) forbids hazardous waste disposal to an unpermitted facility (or the ground, etc.)

## Key Concepts – Characterization vs. Profiling

- Permitted facilities must ensure waste is acceptable for disposal under the terms of their State-issued permit
- Title 22 Chapter 14: disposal facilities “may” use information supplied by the generator, but also may use their own analyses of the waste, which are typically done in their own in-house, **non ELAP-certified** lab
- TSDF facilities often test for parameters that are important to their processes but are not themselves hazardous waste criteria

## Key Concepts – Characterization vs. Profiling

- Will a waste broker or waste disposal company assist you with characterization? Sure! But the legal responsibility remains with the generator.
- Do waste brokers/disposal firms have strong or complete knowledge of waste characterization? You would hope so... But the legal responsibility remains with the generator.
- Consolidation in the waste disposal industry has not helped when it comes to California waste classification.

## Key Points in Waste Profiling

- Profiles are typically provided in a completed form – but your signature as generator is attesting to everything on it
- Like signing waste manifests, they can be an article of faith – you hope the broker/facility has done it correctly
- Are you an expert in the land ban requirements? In DOT hazardous materials classification?
- What's on the waste profile will end up on the waste manifest!

EPA Waste Codes D001	State Waste Codes CA352	Additional Description (Section J)																																												
DOT Shipping Description UN1325, Waste Flammable solids, organic, n.o.s. (paper/raos/foli/laquer thinner). 4.1. PGIII		Special Handling (Section 15) debris/laquer thinner-Japp/10080147																																												
<b>CHARACTERISTICS</b>																																														
Reactivity <input type="checkbox"/> Shock Sensitive <input type="checkbox"/> DOT Explosive <input type="checkbox"/> Water Reactive <input type="checkbox"/> Pyrophoric <input type="checkbox"/> Air Reactive <input type="checkbox"/> Oxidizer <input type="checkbox"/> Acid Reactive <input type="checkbox"/> Cyanides <input type="checkbox"/> Alkaline Reactive <input type="checkbox"/> Sulfides <input type="checkbox"/> Polymerizable	Physical State: Solid _____ Density: 8.00 Specific Gravity: 0.99 Liquid _____ Solid 100 _____ Sludge _____ Gas _____ Phases/Layers: Single _____ Viscosity: N/A _____ Odor: <input type="checkbox"/> None <input checked="" type="checkbox"/> Mild <input type="checkbox"/> Strong Chlorine Content: 0 _____ Describe: thinner pH: N/A _____ BTU/Lb: >7000 _____																																													
<b>CONSTITUENTS</b> <table border="1"> <thead> <tr> <th></th> <th>Avg%</th> <th>Min%</th> <th>Max%</th> </tr> </thead> <tbody> <tr> <td>raos</td> <td>50.00</td> <td>45.00</td> <td>55.00</td> </tr> <tr> <td>Oil</td> <td>10.00</td> <td>5.00</td> <td>15.00</td> </tr> <tr> <td>laquer thinner</td> <td>15.00</td> <td>10.00</td> <td>20.00</td> </tr> <tr> <td>paper</td> <td>50.00</td> <td>45.00</td> <td>55.00</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			Avg%	Min%	Max%	raos	50.00	45.00	55.00	Oil	10.00	5.00	15.00	laquer thinner	15.00	10.00	20.00	paper	50.00	45.00	55.00																									<b>OTHER COMPONENTS</b> PCB's 0.00 ppm Cyanides 0.00 ppm Phenolics 0.00 ppm Sulfides 0.00 ppm Dioxins 0.00 ppm Pesticides 0.00 ppm Halogens 0.00 ppm
	Avg%	Min%	Max%																																											
raos	50.00	45.00	55.00																																											
Oil	10.00	5.00	15.00																																											
laquer thinner	15.00	10.00	20.00																																											
paper	50.00	45.00	55.00																																											
<b>ANNUAL REPORT CODES</b>																																														
Source Code: _____ Point of Measure: _____																																														
Form Code: _____ Radioactive Mixed: _____																																														
Origin Code: _____ System Code: _____																																														
<b>REGULATORY INFORMATION</b>																																														
Generating Process: _____																																														
Infectious or Biological Waste? <input type="checkbox"/> No <input checked="" type="checkbox"/> NRC Regulated Radioactive? <input type="checkbox"/> No <input checked="" type="checkbox"/>																																														
Is this waste regulated under Subpart CC (VOC > 500 ppm)? <input type="checkbox"/> No <input checked="" type="checkbox"/> Spent Solvent? <input type="checkbox"/> No <input checked="" type="checkbox"/>																																														
Is this waste regulated as an ozone depleting substance? _____																																														
<b>METALS</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> TOTAL (ppm) <input type="checkbox"/> TCLP (mg/L)																																														
ENGINEERING, LLC www.YorkeEngr.com																																														

63

## Key Points in Waste Profiling

- Carefully review each waste profile that you sign:
  - Verify the generator ID number and addresses
  - What analytical data is used/referenced? Was it produced by an ELAP-certified laboratory?
  - On what basis was each federal waste number, and each State waste code, assigned? Are any missing?
  - Question the facility representative on the DOT information – who assigned it?
  - At least read over everything before signing

64



## Agenda



- Hazardous Waste Regulatory Framework
- Waste Classification – Listed Wastes
- Waste Classification – Characteristic Wastes
- Understanding Laboratory Data
- Waste Characterization vs. Waste Profiling
- **Examples of Non-RCRA (California-only) Hazardous Wastes**

## Common Wastes – Used Oil



- Federal – non-hazardous; **California – hazardous!**
- Basis: California statute specifically requires used oil to be managed as a hazardous waste
- “Oil” includes engine oil, transmission oil, hydraulic oil, and refrigeration oil
- Not fuels, grease, or non-oils, such as brake fluid, or non-petroleum oil
- Oil recycling is desirable – but used oil must be managed as hazardous waste up until the point at which it has actually been recycled

## Used Oil – Some Relief

- Effective January 2019, used oil can be managed as “Recycled Oil” instead of hazardous waste if:
  - The oil is not hazardous waste
  - Meets standards of purity and any other testing requirements of Used Oil facility
  - Oil is generated by a “generator of highly controlled used oil (HCUO)”
  - Certified **annually** that the oil meets all the above requirements



## Common Wastes – Used Antifreeze

- Federal – non-hazardous; **California – hazardous!**
- Basis: ethylene glycol/propylene glycol exhibit toxicity characteristics based on their aquatic toxicity (i.e., fail the fish kill test)
- Again – recycling is good, but it is a hazardous waste up until that point



## Common Wastes – Universal Wastes

- Batteries: **alkaline batteries** are hazardous in CA due to the “corrosive solid” concept
- Lamps/switches: does not depend on testing; **any mercury-added lamp or switch** in CA is a listed waste
- **Electronic devices**: no one tests electronic devices, See list of “presumed hazardous” electronic wastes in Appendix X
- **Solar PV modules**: few people test, but not listed in Appendix X

## One Final Note: The Generator Improvement Rule

- U.S. EPA promulgated the Generator Improvement Rule on May 30, 2017
- DTSC is updating California regulations to incorporate required provisions – expect finalization in June 2024
- No change in hazardous waste characterization other than additional recordkeeping requirements mentioned earlier

## Questions?

---

- Webinar Questions

**Geoff Knight**

**(949) 248-8490**

**[GKnight@YorkeEngr.com](mailto:GKnight@YorkeEngr.com)**



- Other General Environmental Questions

**Brian A. Yorke**

**Operations & Marketing**

**(949) 248-8490**

**[BYorke@YorkeEngr.com](mailto:BYorke@YorkeEngr.com)**