Human Health Risk Assessment

Department of Toxic Substances Control

CalEPA
California Environmental Protection Agency

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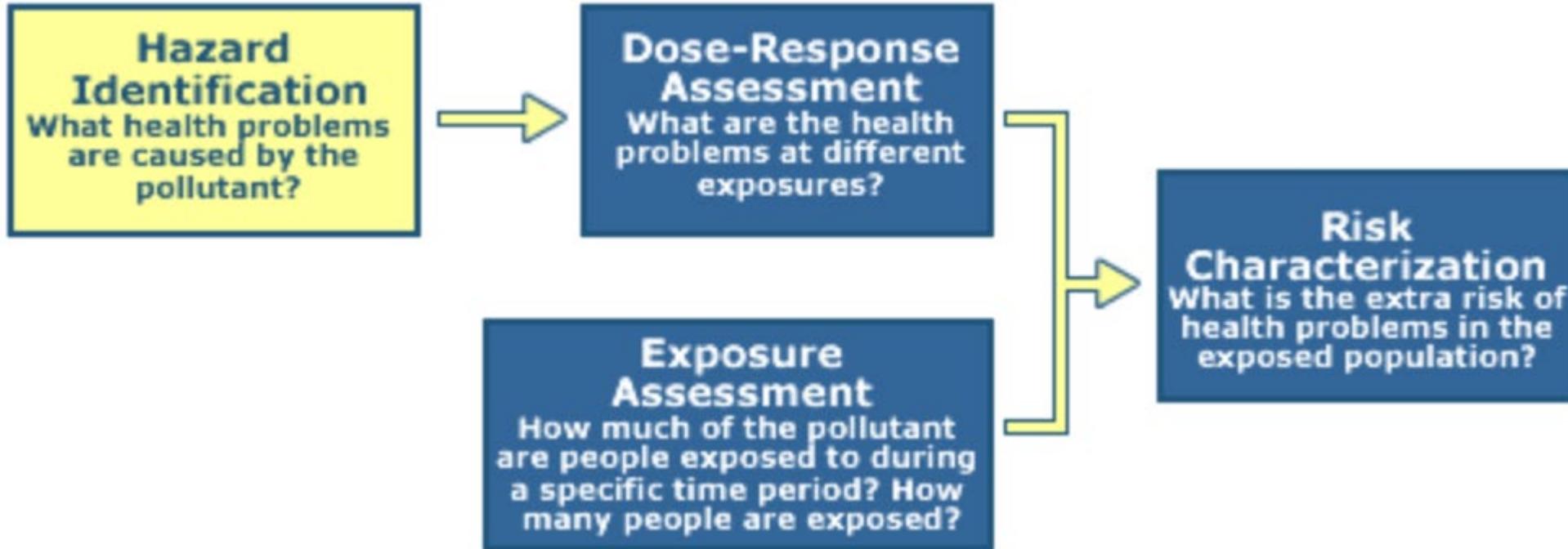Human and Ecological Risk Office (HERO)
Cal/EPA, DTSC

Prepared for Monterey County Board of Supervisors Meeting on March 17, 2026.

Objectives of HHRA

- To determine if the **<u>fire</u>** released chemicals (such as metals) into the environment (such as soil and water) that may cause **<u>health</u>** concerns to **<u>residents</u>** from **<u>chronic</u>** (>1 year) exposure.

Process of HHRA

HAZARD + EXPOSURE = RISK

Hazard Identification
What health problems are caused by the pollutant?

→

Dose-Response Assessment
What are the health problems at different exposures?

Exposure Assessment
How much of the pollutant are people exposed to during a specific time period? How many people are exposed?

→

Risk Characterization
What is the extra risk of health problems in the exposed population?

Source: https://www.epa.gov/risk/conducting-human-health-risk-assessment; https://www.jsheld.com.

Step 1: Hazard Identification

- Identify chemicals with potential health concern

Compound	Cancer	Non-cancer
Lithium	-	✓
Nickel	✓	✓
Manganese	-	✓
Benzo(a)pyrene (PAHs)	✓	✓
2,3,7,8-TCDD (Dioxins)	✓	✓

Source: DTSC HHRA Note 10; U.S. EPA RSLs.

Increasing effect

no-effect range | range of increasing effect with increasing dose | maximum effect range

Increasing dose

Step 2: Dose-Response Assessment

- Quantify how toxic (potent) each chemical is

- **Most sensitive** adverse effect(s) and subpopulation(s)

- DTSC and U.S. EPA have published cancer and non-cancer toxicity values for >800 chemicals (e.g., DTSC **HHRA Note 10**).

Source: https://toxedfoundation.org/basics-of-dose-response/

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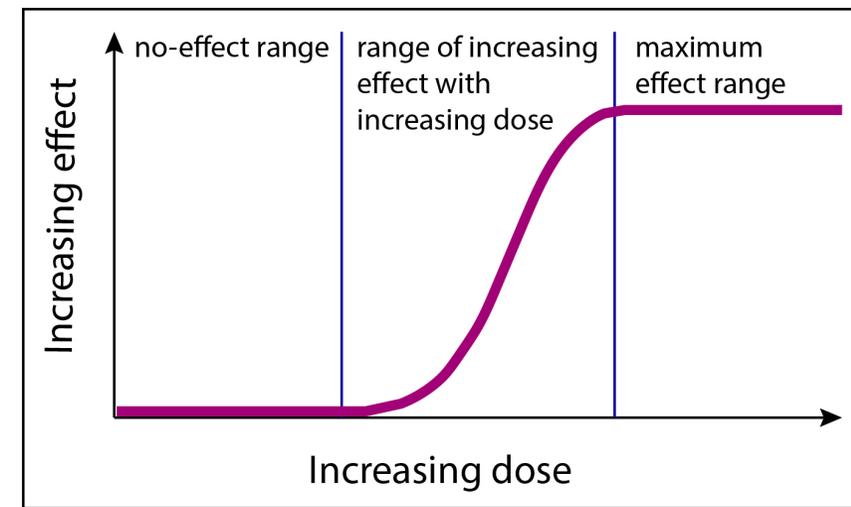
Step 3: Exposure Assessment

- Quantify the **amount, frequency and duration** of chemical exposure
  - Inhalation
  - Dermal contact
 - Oral ingestion

Conceptual Site Model
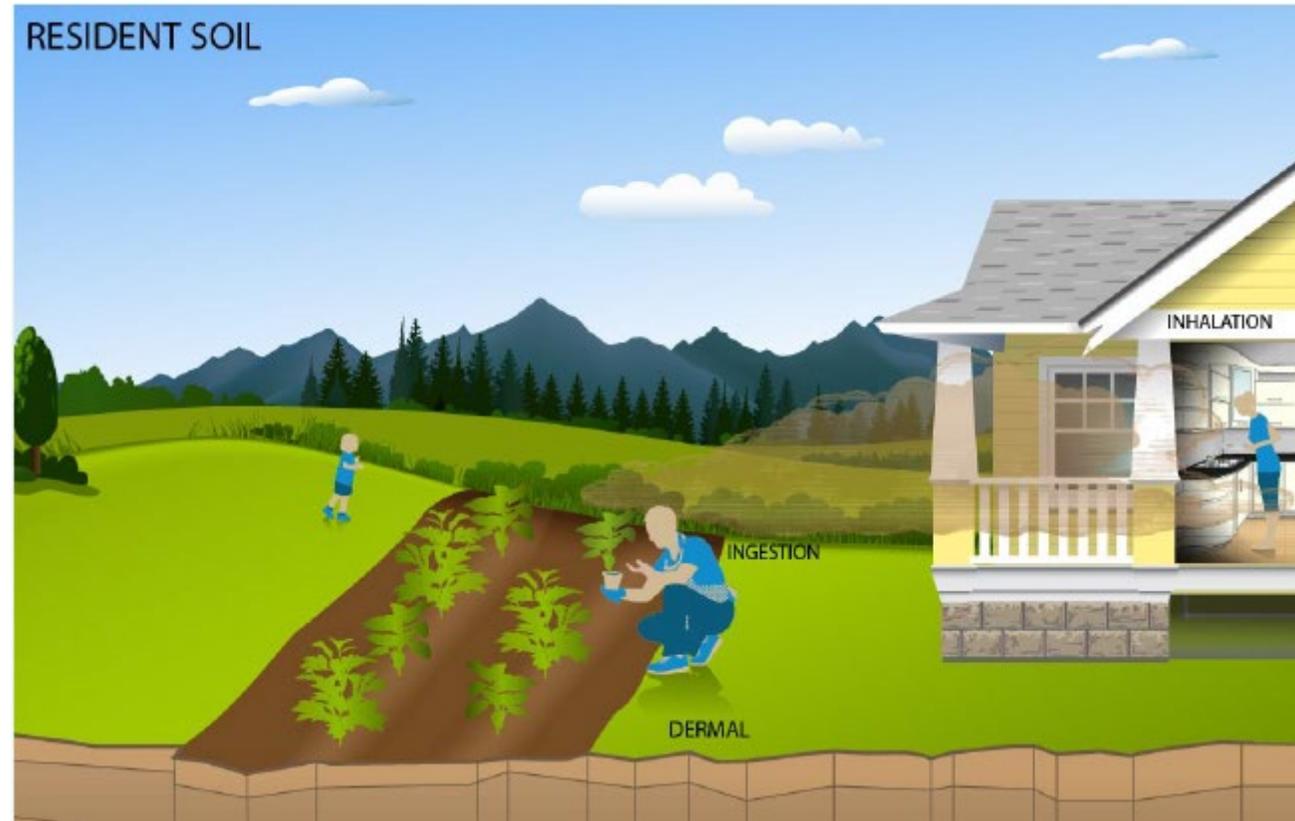
Source: https://rais.ornl.gov/tools/rais_chemical_prg_guide.html.

Exposure Assumptions to Assure Protectiveness

- **<u>Residential child</u>** scenario considered to protect all the populations

- Exposure assessment
  - **<u>Early-in-life</u>** exposure (3rd trimester of pregnancy)
  - **<u>24</u>** hours per day, **<u>7</u>** days per week, 350 days per year, 26 years

Step 4: Risk Characterization

- **Combine** exposure and toxicity information to calculate risk estimates;

- Inform management decisions;

- Risk assessment is **science**-based process;

- Risk assessment often uses a **tiered** approach.
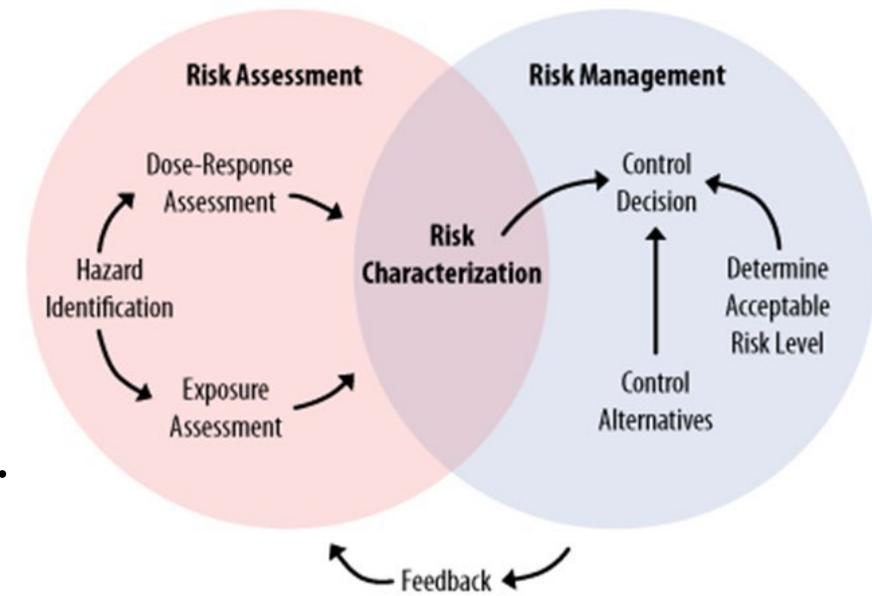
Source material credit: nlm.nih.gov

Source: https://www.epa.gov/risk/conducting-human-health-risk-assessment.

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Human Health Risk Based Screening Levels

- Risk-based screening levels published in **<u>DTSC HHRA Note 3</u>**
  - Chemical specific
  - Environmental matrices (soil and water)
  - Two human receptors (**<u>resident</u>** and worker)
  - Cancer and non-cancer health effects

- Additional screening levels are also available from U.S. EPA

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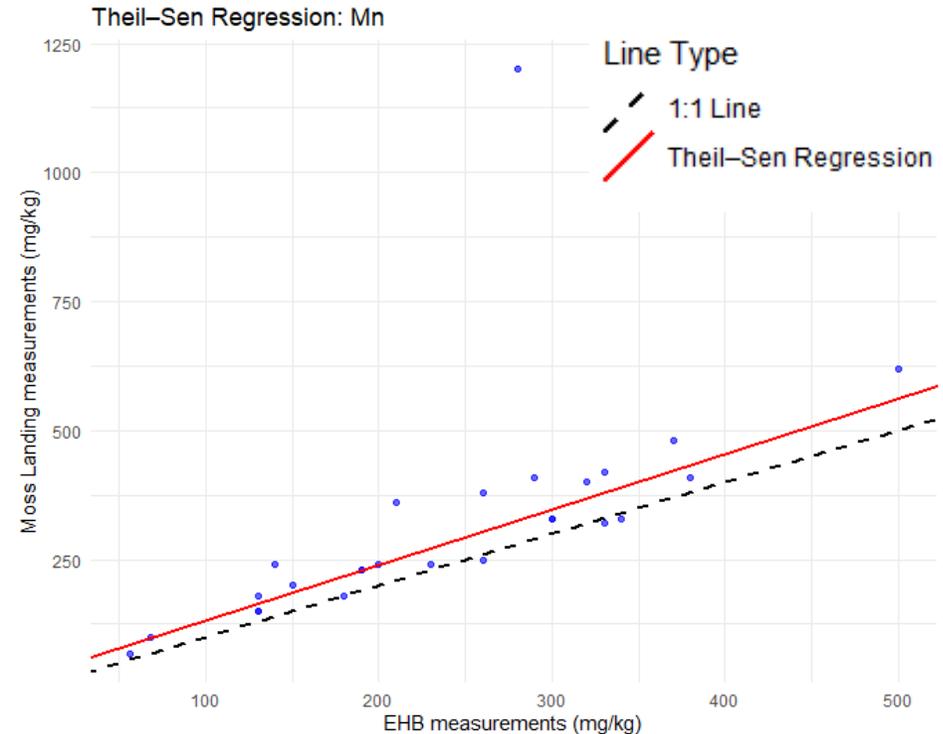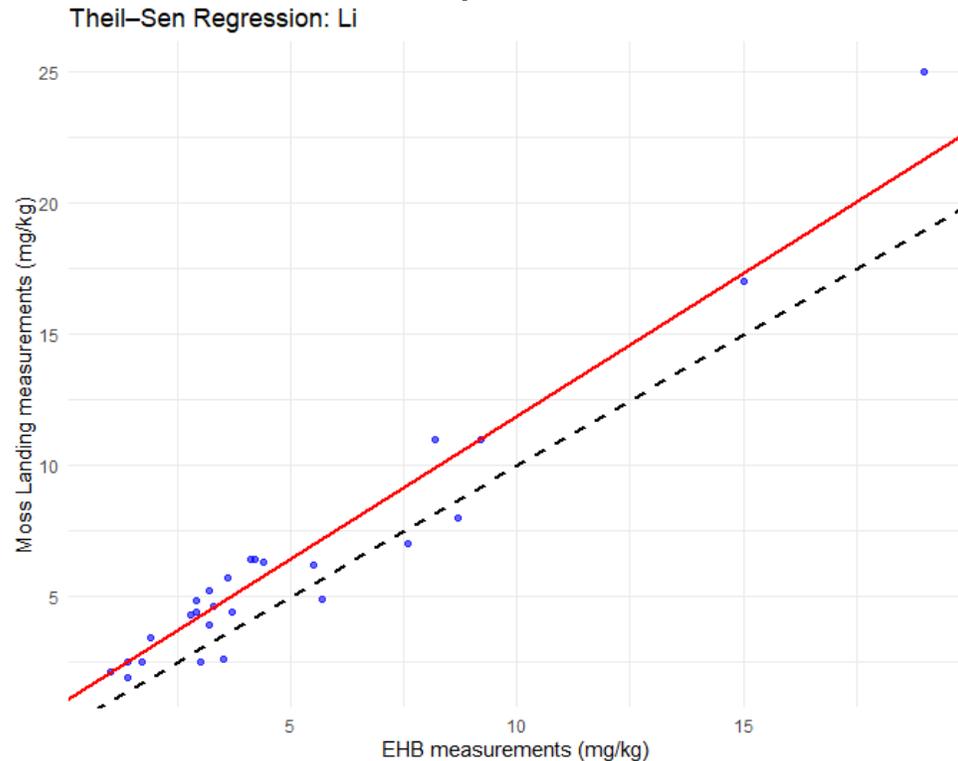# Multiple Lines of Evidence (MLE)

- Data collected and analyzed for assessing risks:
  - Air modeling (soot deposition plume from U.S. EPA)
  - Proximity to potential human receptors
  - Distance to the release source
  - Co-located samples
  - Co-occurrence of chemicals potentially released from the fire
  - Split sample analysis by different laboratories

Metals in Soil

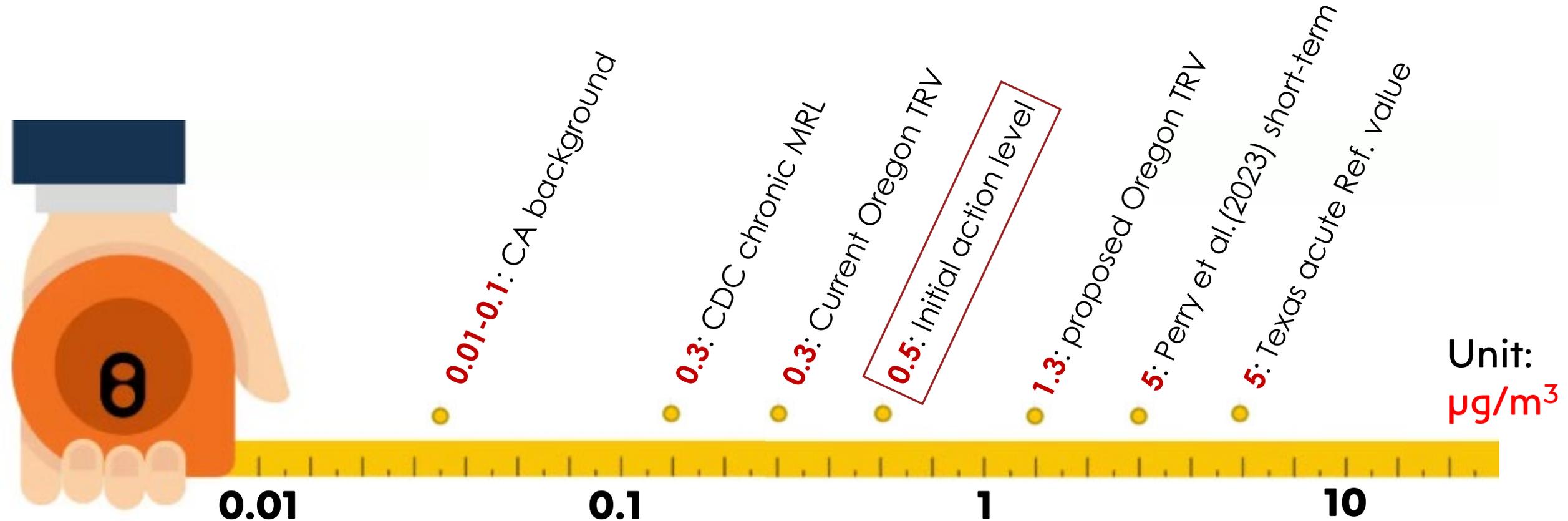| Location Code	Field ID	Sample Depth (ft bgs)	Date	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Lithium mg/kg	Manganese mg/kg	Nickel mg/kg
DTSC-SLs Soil Res or, if not promulgated, EPA RSL (Nov 2024, HQ=1.0) - Resident Soil				23	3,100	80	160	1,800	820
SB-01A	SB-01A-0.25	0 - 0.25	05/13/2025	4.4	8.1	5.3	6.2	150	27
	SB-01A-0.5	0.25 - 0.5	05/13/2025	4	7.1	4.3	5.9	120	23
SB-01B	SB-01B-0.25	0 - 0.25	05/13/2025	5.1	6.9	4.6	6.2	180	26
	SB-01B-0.5	0.25 - 0.5	05/13/2025	4.3	5.4	3.7	7	130	25
SB-02A	SB-02A-0.25	0 - 0.25	05/13/2025	3	2.7	1.9	3.9	68	18
	SB-02A-0.5	0.25 - 0.5	05/13/2025	1.6	2.3	1.5	2.5	49	9.3
SB-02B	SB-02B-0.25	0 - 0.25	05/13/2025	2.5	2.5	1.6	3.4	53	15
	SB-02B-0.5	0.25 - 0.5	05/13/2025	1.6	1.8	2.1	2.4	52	8.8
SB-03A	SB-03A-0.25	0 - 0.25	05/13/2025	5.9	21	9.9	17	400	21
	SB-03A-0.5	0.25 - 0.5	05/13/2025	1.9	8.1	4.5	8.2	230	6.9
SB-03B	SB-03B-0.25	0 - 0.25	05/13/2025	5.9	22	8.6	18	410	20
	SB-03B-0.5	0.25 - 0.5	05/13/2025	2.8	11	5.4	11	390	8.6
SB-04A	SB-04A-0.25	0 - 0.25	05/13/2025	2.6	6.5	12	4.4	250	13
	SB-04A-0.5	0.25 - 0.5	05/13/2025	2.7	6.7	9.8	4.4	280	13
SB-04B	SB-04B-0.25	0 - 0.25	05/13/2025	2.5	7.1	16	4.2	250	12
	SB-04B-0.5	0.25 - 0.5	05/13/2025	2.7	6.8	8.7	4.3	270	13
SB-05A	SB-05A-0.25	0 - 0.25	05/13/2025	7.1	27	12	11	410	36
	SB-05A-0.5	0.25 - 0.5	05/13/2025	4.9	13	8.9	7.4	210	23
SB-05B	SB-05B-0.25	0 - 0.25	05/13/2025	6	23	15	8.7	370	31
	SB-05B-0.5	0.25 - 0.5	05/13/2025	5.3	23	12	6.6	240	20
SB-06A	SB-06A-0.25	0 - 0.25	06/20/2025	7.7	15	14	2.6	400	12
	SB-06A-0.5	0.25 - 0.5	06/20/			14			
SB-06B	SB-06B-0.25	0 - 0.25	06/20/	5.2		16	16	420	
	DUP01-06202025	0 - 0.25	06/20/			16	16		
	SB-06B-0.5	0.25 - 0.5	06/20/	4.4		15	15	230	
SB-07A	SB-07A-0.25	0 - 0.25	05/13/				1.7		
	SB-07A-0.5	0.25 - 0.5	05/13/				9		
SB-07B	SB-07B-0.25	0 - 0.25	05/13/	25			5.5	2,700	
	DUP-05132025	0 - 0.25	05/13/				33		
	SB-07B-0.5	0.25 - 0.5	05/13/	6.0 ^A			8.4	460 ^A	
SB-08A	SB-08A-0.25	0 - 0.25	05/22/				4.2		
	SB-08A-0.5	0.25 - 0.5	05/22/	4.4			4.5	340	
	DUP04-05222025	0.25 - 0.5	05/22/				4.8		
SB-08B	SB-08B-0.25	0 - 0.25	05/22/				4.6		
	SB-08B-0.5	0.25 - 0.5	05/22/2025	7.7	6.5	5.4	6.6	400	12
SB-09A	SB-09A-0.25	0 - 0.25	05/13/2025	5.2	15	66	4.3	420	12
	SB-09A-0.5	0.25 - 0.5	05/13/2025	4.4	9.8	31	4.7	230	12
SB-09B	SB-09B-0.25	0 - 0.25	05/13/2025	25	12	35	4.2	2,700	14
	SB-09B-0.25	0 - 0.25	05/13/2025	6.0 ^A	-	-	-	460 ^A	-
	SB-09B-0.5	0.25 - 0.5	05/13/2025	4.4	11	27	3.4	340	9.5

Comparing Measurements from Two Labs

- Measurements from the consultant lab are **comparable** to those from the county-selected lab.

Air Action Level for Manganese

- **<u>Initial</u>** action level: 0.5 μg/m³ (24-hr average)

0.01-0.1: CA background

0.3: CDC chronic MRL

0.3: Current Oregon TRV

0.5: Initial action level

1.3: proposed Oregon TRV

5: Perry et al.(2023) short-term

5: Texas acute Ref. value

Unit: μg/m³

0.01   0.1   1   10

Summary

- Based on the collected soil and surface water data, HERO concurs that human health risks are **not expected** from chronic exposure to the sampled media.

- Risks were assessed based on **conservative** toxicity and exposure assumptions