INDOOR GUN RANGE INSPECTIONS

2020 CUPA CONFERENCE

County of San Diego - Department of Environmental Health
Arleen Gurfield, Colleen Hines, Ewan Moffat

TYPES OF SHOOTING RANGES

- **TYPES OF RANGES:** *Indoor vs. Outdoor*
- **TYPES OF GUNS:** *Pistols, Shotguns, Rifles, Rapid-fire*
- **TYPES OF BULLETS:** *Lead, Copper, Rubber, Blanks, etc.*

INDOOR RANGES

- **LAW ENFORCEMENT:** (14)
  - *Police Departments*
  - *State and Federal Agencies*
  - *Military***
- **PUBLIC:** (11)
  - *Businesses*
- **PRIVATE:** (5+)
  - *Gun Clubs*

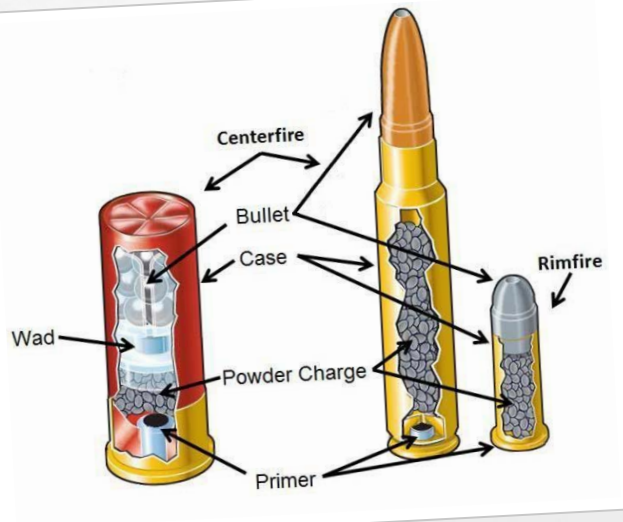
**MILITARY MUNITIONS RULE 62 FR 6621

- DIFFERENT DEFINITIONS OF "SOLID WASTE"
- ADDITIONAL INFORMATION IS AVAILABLE AT: https://www.epa.gov/enforcement/environmental-challenge-military-munitions-and-federal-facilities#State Authority

State Authority

Nothing in CERCLA, RCRA or in EPA's Military Munitions Rule bars a State from exercising its own solid and hazardous waste authority over waste military munitions, including MEC/MC, regardless of whether they have adopted the Military Munitions Rule as part of their authorized RCRA program. State equivalent authorities can cover the major steps in the process needed to manage MEC from discovery to destruction. DoD and/or other appropriate responsible parties have an obligation at "locations other than operational ranges" to clean up MEC when required under state and federal statutory authorities, and such cleanup may be subject to both state and EPA oversight.

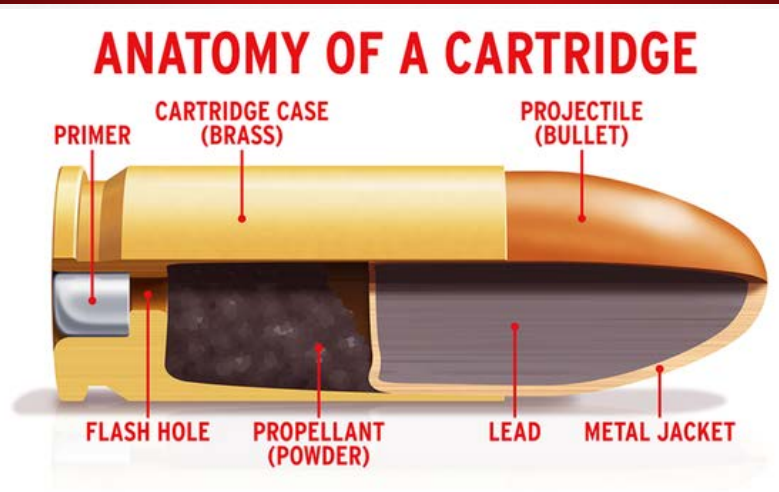
MEC: "munitions and explosives of concern"



"Fine powder" means a metal in dry, solid form having a particle size smaller than 100 micrometers (0.004 inches) in diameter. 22 CCR 66260.10

WHAT'S THE RISK?

IT'S NOT JUST THE BULLET!



LEAD POISONING

IT'S NOT JUST THE BULLET!

Laidlaw *et al. Environmental Health* (2017) 16:34
DOI 10.1186/s12940-017-0246-0

Environmental Health

REVIEW Open Access

Lead exposure at firing ranges—a review

Mark A. S. Laidlaw[1*], Gabriel Filippelli[2], Howard Mielke[3], Brian Gulson[4] and Andrew S. Ball[1]

Abstract

Background: Lead (Pb) is a toxic substance with well-known, multiple, long-term, adverse health outcomes. Shooting guns at firing ranges is an occupational necessity for security personnel, police officers, members of the military, and increasingly a recreational activity by the public. In the United States alone, an estimated 16,000–18,000 firing ranges exist. Discharge of Pb dust and gases is a consequence of shooting guns.

Methods: The objectives of this study are to review the literature on blood lead levels (BLLs) and potential adverse health effects associated with the shooting population. The search terms "blood lead", "lead poisoning", "lead exposure", "marksmen", "firearms", "shooting", "guns", "rifles" and "firing ranges" were used in the search engines Google Scholar, PubMed and Science Direct to identify studies that described BLLs in association with firearm use and health effects associated with shooting activities.

Results: Thirty-six articles were reviewed that included BLLs from shooters at firing ranges. In 31 studies BLLs > 10 μg/dL were reported in some shooters, 18 studies reported BLLs > 20 μg/dL, 17 studies > 30 μg/d, and 15 studies BLLs > 40 μg/dL. The literature indicates that BLLs in shooters are associated with Pb aerosol discharge from guns and air Pb at firing ranges, number of bullets discharged, and the caliber of weapon fired.

Conclusions: Shooting at firing ranges results in the discharge of Pb dust, elevated BLLs, and exposures that are associated with a variety of adverse health outcomes. Women and children are among recreational shooters at special risk and they do not receive the same health protections as occupational users of firing ranges. Nearly all BLL measurements compiled in the reviewed studies exceed the current reference level of 5 μg/dL recommended by the U.S. Centers for Disease Control and Prevention/National Institute of Occupational Safety and Health (CDC/NIOSH). Thus firing ranges, regardless of type and user classification, currently constitute a significant and unmanaged public health problem. Prevention includes clothing changed after shooting, behavioural modifications such as banning of smoking and eating at firing ranges, improved ventilation systems and oversight of indoor ranges, and development of airflow systems at outdoor ranges. Eliminating lead dust risk at firing ranges requires primary prevention and using lead-free primers and lead-free bullets.

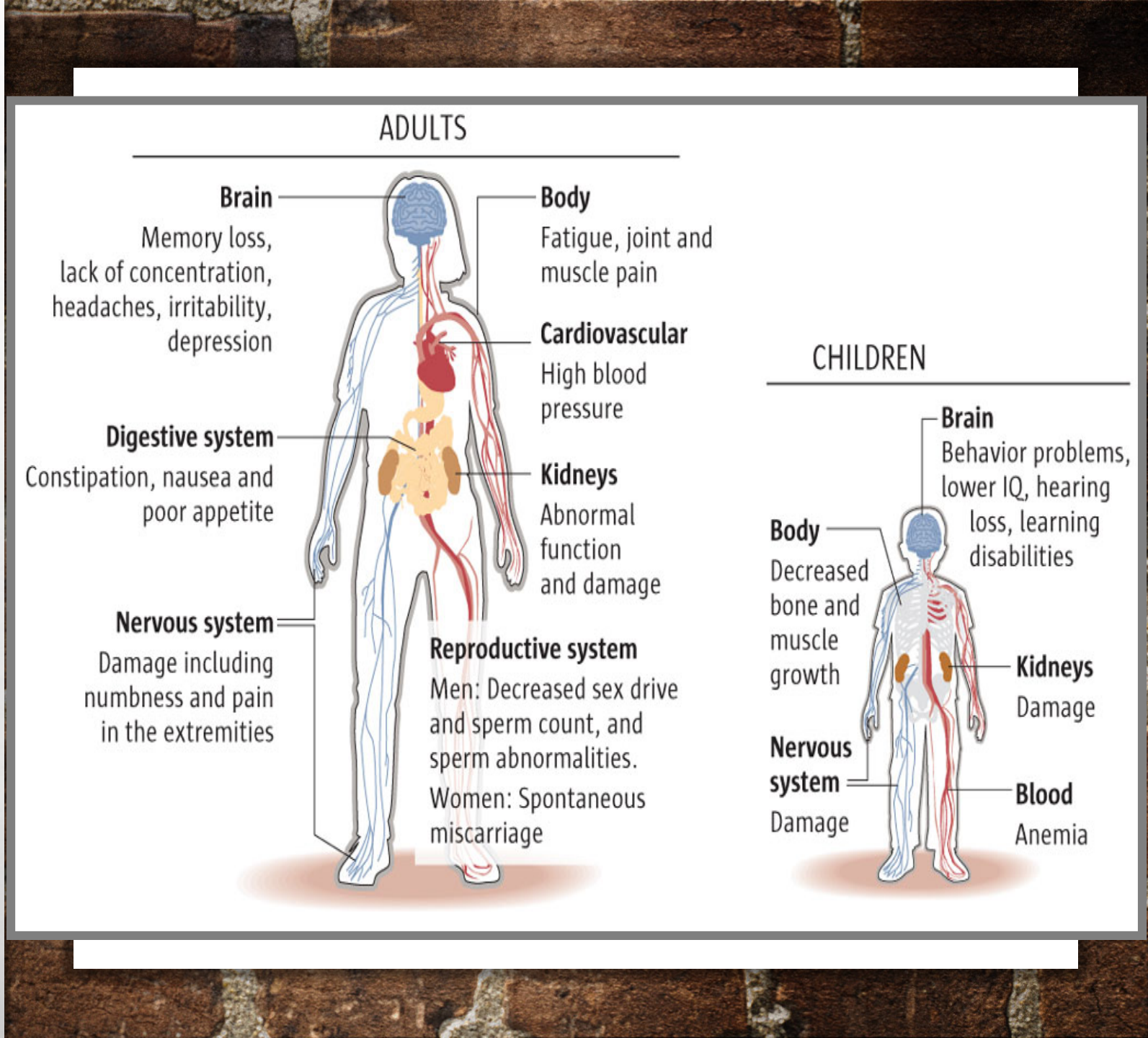
Keywords: Blood, Lead, Poisoning, Shooting, Range, Firearms, Health, Effects, Expert shooter, Guns

FIRING RANGE STATISTICS*

- Estimated **16,000-18,000 indoor firing ranges** in the United States (U.S.)
- Approximately **1 Million law enforcement** officers train at indoor ranges and **20 Million citizens** practice target shooting as a leisure activity
- In 2012, the USGS calculated about **60,100 metric tons** of lead were used in ammunition and bullets in the U.S.
- Half-life of lead in surface soils has been estimated as approximately **700 years** and are highly bioavailable

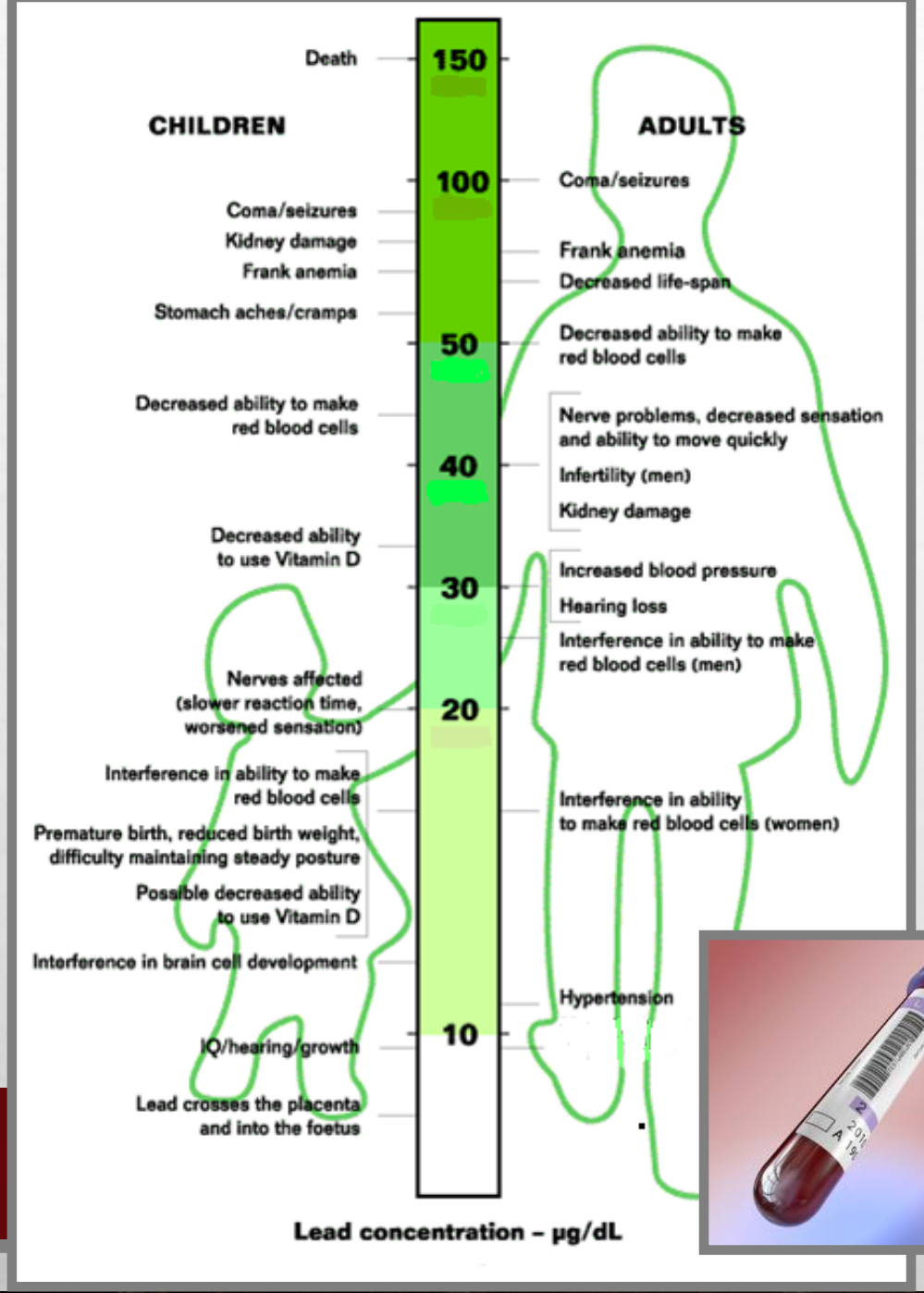
*Laidlaw et al, “Lead Exposure at Firing Ranges”, Environmental Health (2017) 16:34

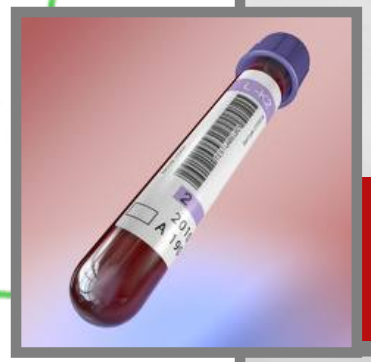
HEALTH EFFECTS OF LEAD



SYMPTOMS OF LEAD POISONING

- HEADACHE
- POOR APPETITE
- DIZZINESS
- IRRITABILITY/ANXIETY
- CONSTIPATION
- PALLOR
- EXCESSIVE TIREDNESS
- NUMBNESS
- NAUSEA
- FINE TREMORS
- INSOMNIA
- METALLIC TASTE IN MOUTH
- MUSCLE AND JOINT PAIN
- SLEEPLESSNESS
- HYPERACTIVITY
- WEAKNESS
- REPRODUCTIVE DIFFICULTIES
- LEAD LINE IN GUMS
- WRIST DROP





ROUTES OF EXPOSURE

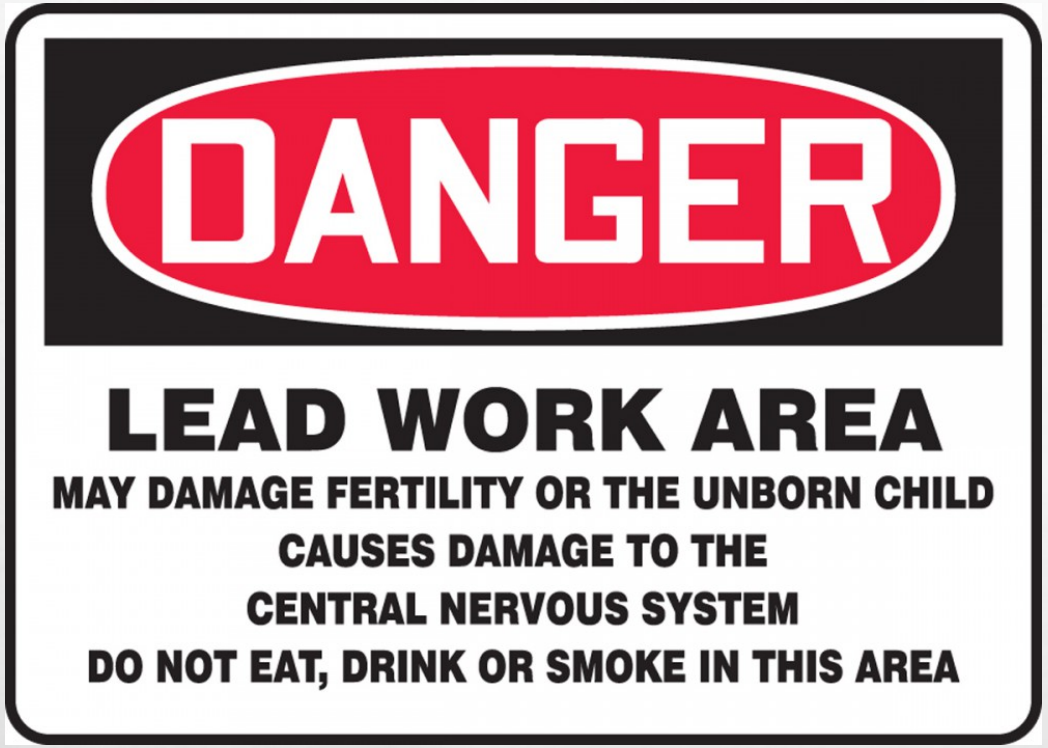
- **INHALATION:**
  Breathing lead fumes or dust. Elevated BLL from indoor firing ranges result in **greater absorption than ingestion and dermal absorption***. Most common route of entry in the workplace.
- **INGESTION:**
  Swallowing lead dust via food or smoking cigarettes
- Blood lead levels are measured in your blood stream

*Laidlaw et al, “Lead Exposure at Firing Ranges”, Environmental Health (2017) 16:34

LEAD STANDARDS - RESIDENTIAL

- HAZARD STANDARDS FOR LEAD IN PAINT, DUST, AND SOIL (TSCA SECTION 403)

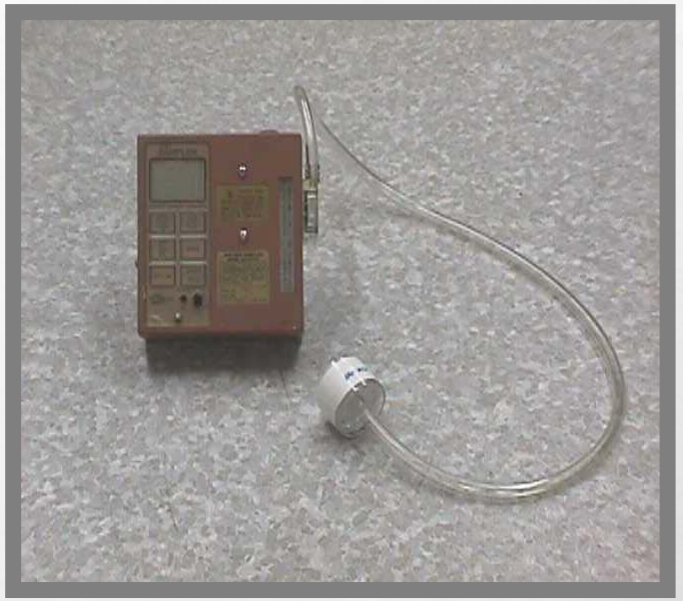
This rule establishes standards to help property owners, lead paint professionals and government agencies identify lead hazards in residential paint, dust and soil. The rule establishes standards for lead-based paint hazards (including hazards from lead in dust and soil) in most pre-1978 housing and child-occupied facilities. Under these standards, lead is considered a hazard when equal to or exceeding 40 micrograms of lead in dust per square foot on floors, 250 micrograms of lead in dust per square foot on interior window sills, and 400 parts per million (ppm) of lead in bare soil in children's play areas or 1200 ppm average for bare soil in the rest of the yard. In addition, paint in deteriorating condition, on a friction or impact surface, or on certain chewable surfaces is also defined as a hazard.



- CONSTRUCTION: TITLE 8 CCR 1532.1
- GENERAL INDUSTRY: TITLE 8 CCR 5198
  - Range masters
  - Janitorial staff
  - CUPA inspectors
- INFORMATION AND TRAINING
  - Required prior to exposure and annually
  - Training must include specific topics

CAL OSHA REQUIREMENTS - BUSINESSES

AIR MONITORING FOR LEAD



- PERSONAL AIR SAMPLING (Exposure Monitoring)
  - Represents employee exposure by inhalation
  - Comparison to AL and PEL
  - Results from exposure monitoring must be provided to employee within 5 days
  - Medical surveillance may be required if airborne levels exceed the AL

Action Limit (AL)
- 30 µg/m^3 averaged over an 8-hour day

Permissible Exposure Limit (PEL)
- 50 µg/m^3 averaged over an 8-hour day

MINIMIZE EXPOSURE

Engineering Controls

Ventilation

HEPA vacuums

No compressed air

Work Practices

Personal Protective Equipment (PPE)

Minimize dust disturbance

Use wet methods

Handwashing and good hygiene

PPE

Consult your Occupational Health Department

- A minimum of Level D is recommended to prevent taking lead dust home on clothing.
- If sampling, Level C is appropriate. Requirements for Level C are:
  - Airborne contaminants are known
  - NIOSH approved full face or half mask air purifying respirator (APR); provided APR criteria are met
  - Hooded chemical-resistant suit (e.g. Tyvek)
  - Inner and outer chemical-resistant gloves
  - Steel toe or chemical resistant boot covers

RESPIRATORY PROTECTION

- ALL RESPIRATORS REQUIRE INITIAL AND ANNUAL TRAINING
- P100 CARTRIDGES ARE RECOMMENDED
- HALF MASK FACEPIECES + EYE PROTECTION
- FULL FACEPIECES

Work with your Occupational Health Department to ensure your employees are properly trained and protected!

OTHER HAZARDS

- LADDER SAFETY
- ELEVATED WORK SURFACES (e.g. roofs)
- SLIPS/TRIPS/FALLS
- CONFINED SPACE
- ENERGIZED EQUIPMENT / MACHINE GUARDING
- NOISE

LEAD AS HAZARDOUS WASTE

"When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water"
https://www.epa.gov/sites/production/files/2016-01/documents/hw-char.pdf

FEDERAL REGULATION

- 40 CFR §261.24
- D008 - Lead
- Toxicity is determined through:
  - Toxicity Characteristic Leaching Procedure (TCLP)
    - **5.0 mg/L**

CALIFORNIA REGULATION

- 22 CCR §66261.24
- Toxicity is determined through:
  - Total Threshold Limit Concentration (TTLC)
    - **1,000 mg/kg**
  - Soluble Threshold Limit Concentration (STLC)
    - **5.0 mg/L**

OTHER HAZARDOUS WASTES 22 CCR §66261.24

Metal	TTLC	STLC
Antimony	500 mg/kg	15 mg/L
Arsenic ** (D004)	500 mg/kg	5 mg/L**
Copper	2,500 mg/kg	25 mg/L
Mercury ** (D009)	20 mg/kg	0.2 mg/L**
Zinc	5,000 mg/kg	250 mg/L

** Arsenic and Mercury are also a RCRA hazardous wastes. TCLP thresholds are the same as STLC thresholds.

HAZARDOUS WASTE SOURCES

1. DUMPSTERS AND TRASH COMPACTORS
   - Trashcans
2. AIR-HANDLING AND FILTRATION SYSTEM EXHAUSTS
   - Roof
   - Downspouts
3. DRAINAGE SYSTEMS
4. RANGE BACKSTOP
5. GUNSMITHING AND CLEANING SERVICES

HAZARDOUS WASTE SOURCES

6. INADEQUATE WORK PRACTICES DURING **FILTER CHANGES**
7. **FACILITY STAFF ARE UNAWARE OF HAZARDOUS WASTE REGULATIONS** AND DISPOSE OF SWEEPINGS IN THE TRASH

TRASH CANS, DUMPSTERS AND COMPACTORS

CHECK THE DUMPSTER FOR:

- RANGE SWEEPINGS
- SHOTGUN SHELLS
- AIR FILTERS
- WIPES
- BULLET CASINGS
- TARGETS
- STICKY MATS
- ANY OTHER CONTAMINATED DEBRIS

Be mindful of **HSC 25141.5(b)(3)(A-C)** TTLC hazardous waste exclusion

CHECK THE GROUND

- CONTAMINATED DUST AND DEBRIS CAN EASILY BE RELEASED TO THE GROUND AROUND THE DUMPSTER
- CHECK THE PROXIMITY TO THE STORM DRAINS

TTLC Results:

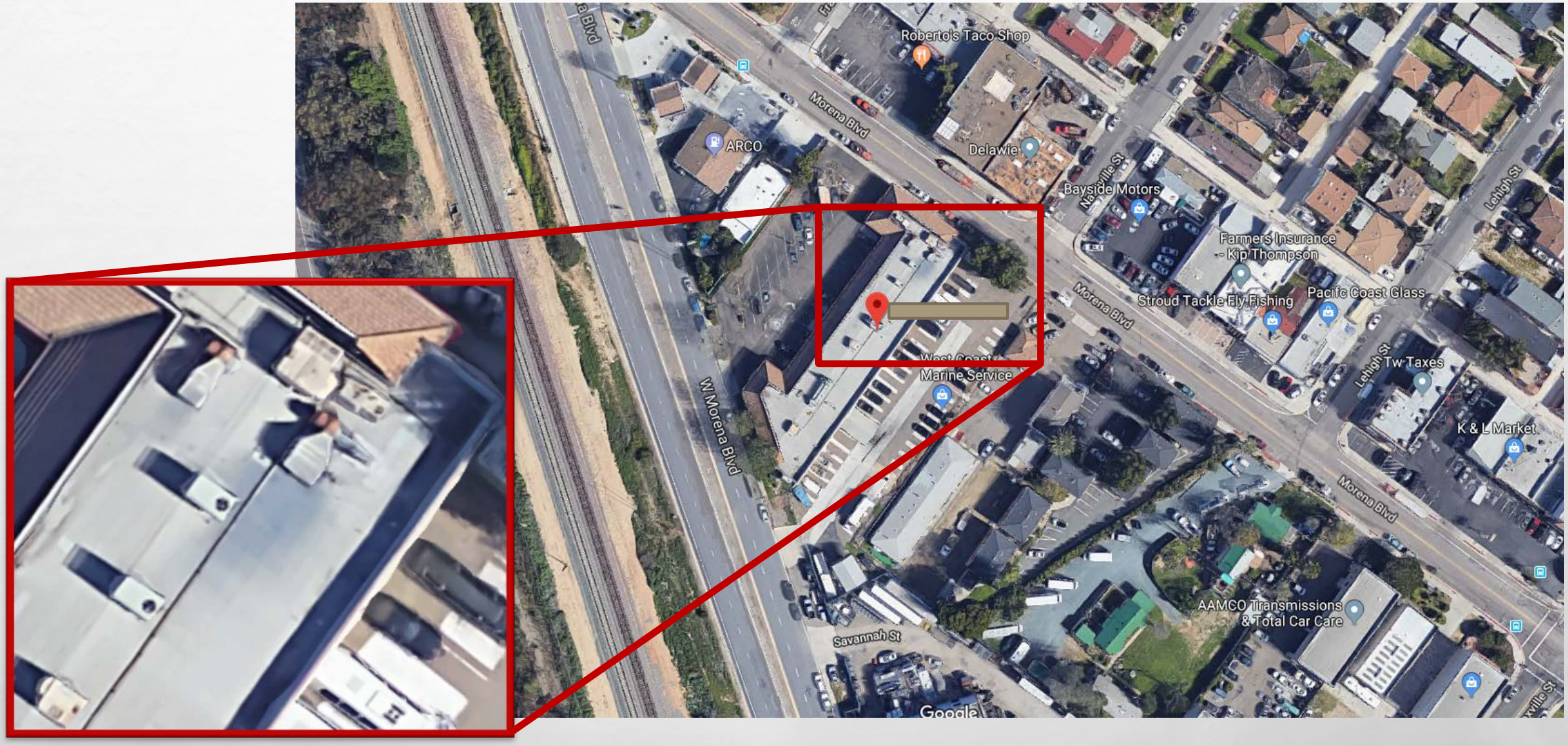
- **Lead 5,800 mg/kg**

CHECK THE TRASHCANS

- Left Wipe: 1,400 mg/kg
- Right Wipe: 910 mg/kg
- TTLC for Lead: 1,000 mg/kg
- STLC* for Lead: 5 mg/L

Be mindful of **HSC 25141.5(b)(3)(A-C)** TTLC hazardous waste exclusion

AIR HANDLING SYSTEMS AND ROOFS



Check the Satellite Images

LEAD, PB

RCRA TOXIC
TCLP THRESHOLD: 5 MG/L
TTLC THRESHOLD: 1,000 MG/KG

LARGE TEAR IN VENTILATION SYSTEM. BACKSTOP MEDIA AND LEAD DUST CONTAMINATION THROUGHOUT ROOF, GROUND, AND SOIL.

TTLC Results:

- **Lead** 19,000 mg/kg
- **Copper** 150,000 mg/kg
- **Antimony** 2,600 mg/kg
- **Zinc** 32,000 mg/kg
- **Mercury** 0.56 mg/kg

TTLC Results:

- **Lead** 1,400 - 40,000 mg/kg
- **Copper** 110 - 16,000 mg/kg
- **Antimony** 16 – 1,600 mg/kg

LEAD, PB

RCRA TOXIC
TCLP THRESHOLD: 5 MG/L
TTLC THRESHOLD: 1,000 MG/KG

INADEQUATE FILTRATION, TEAR IN EXHAUST, LEAD DUST CONTAMINATION THROUGHOUT ROOF, GROUND, AND STORM DRAIN CONVEYANCE

TTLC Results:

- **Lead** 16,000 - 24,000 mg/kg
- **Copper** 2,700 - 4,200 mg/kg
- **Antimony** 1,000 - 3,100 mg/kg

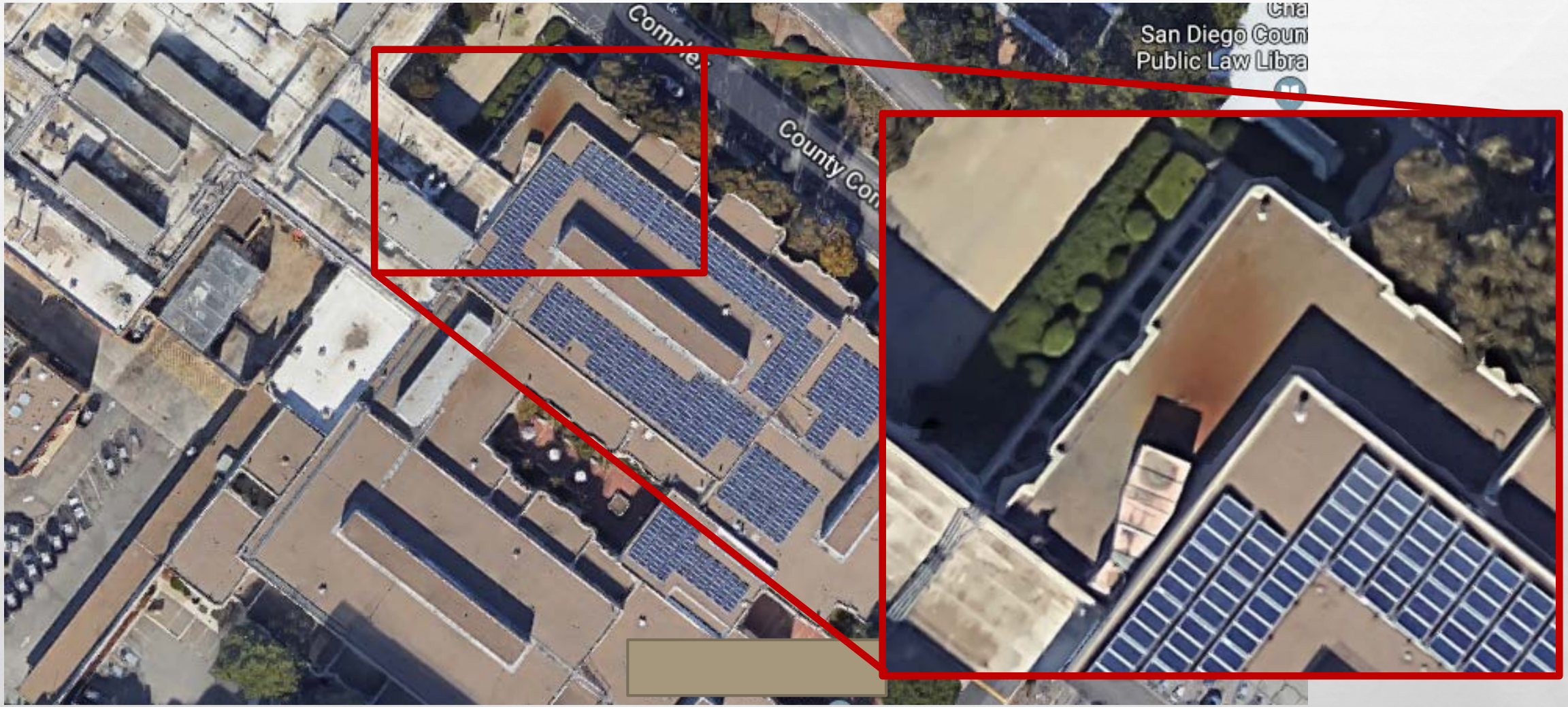
WASTE DETERMINATION NOT MADE

- OVER 70 BAGS OF SPENT USED AIR FILTERS STORED ON THE ROOF FOR SEVERAL YEARS

TTLC Results:

- **Lead** 16,000 - 24,000 mg/kg
- **Copper** 4,600 - 7,200 mg/kg
- **Antimony** 3,800 - 5,200 mg/kg
- **Mercury** 0.41 - 1.3 mg/kg


46 mg/kg
40,000* mg/kg
42 mg/L
19,000** mg/kg
22,000 mg/kg
1,400 mg/kg
5 mg/L
24,000 mg/kg*
16,000 mg/kg*
12 mg/L
23 mg/L
6.6 mg/L
Morena Blvd
W Morena Blvd
Nashville
Bayside Motors
Branco Motors
West Coast Marine Service
Google
* Also failed for Copper
** Also failed for Copper and Zinc



Check the Satellite Images

COPPER, CU

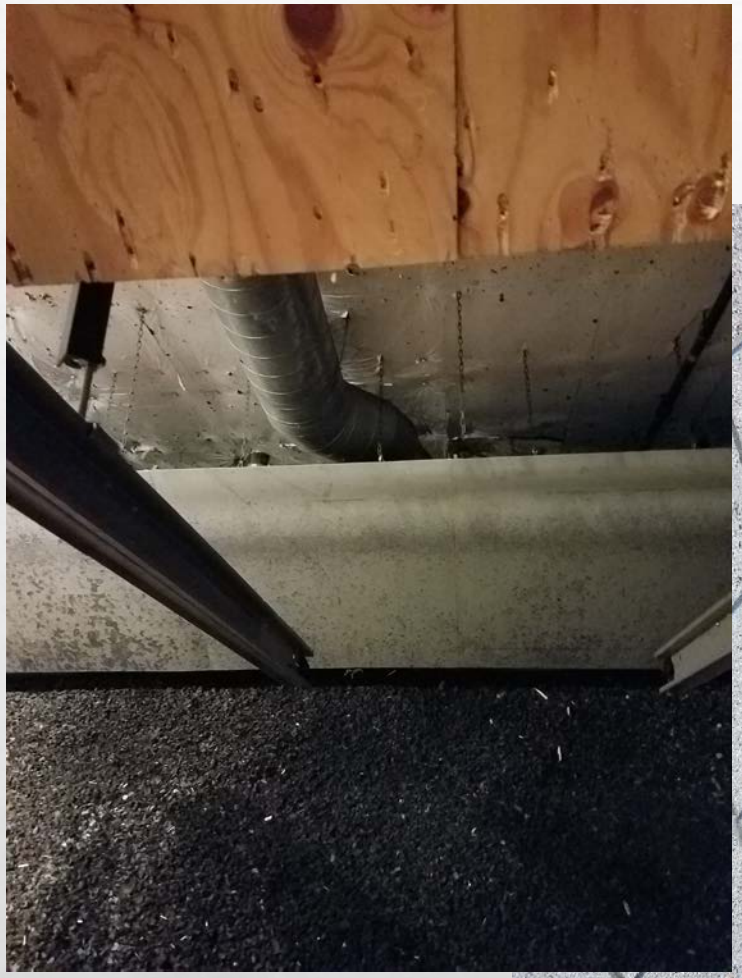
NON-RCRA TOXIC
TTLC THRESHOLD: 2,500 MG/KG

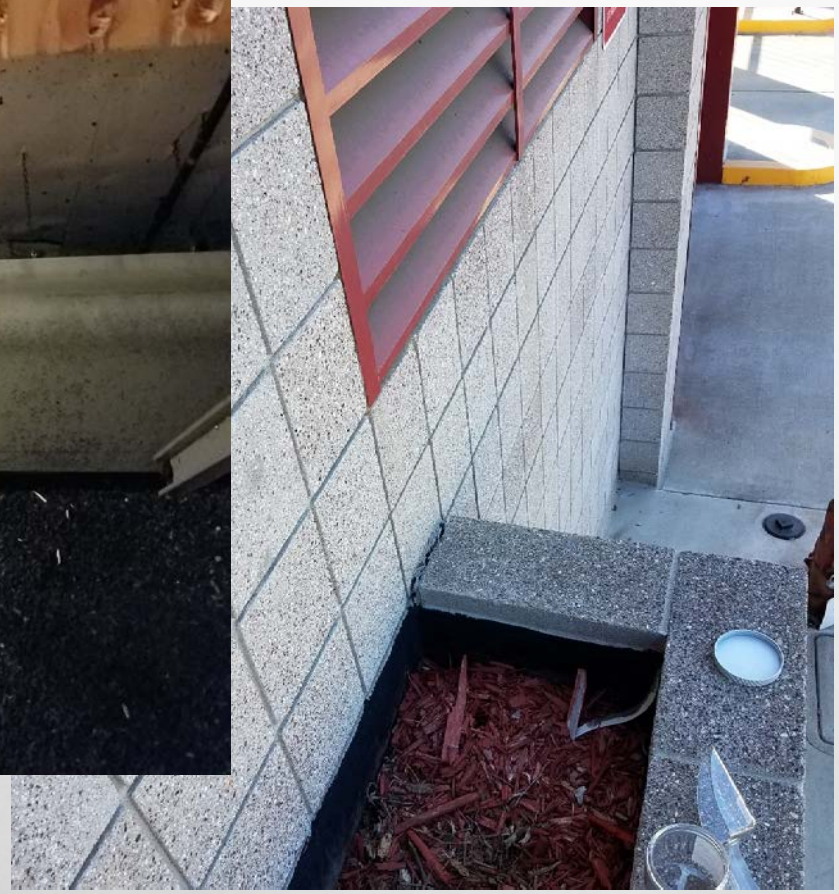
INADEQUATE FILTRATION SYSTEM. COPPER DUST CONTAMINATION THROUGHOUT ROOF AND SURROUNDING AREAS. THIS RANGE WAS SHUTDOWN

TTLC Results:

- **Lead** 1,000 mg/kg
- **Copper** 770,000 mg/kg

FOLLOW THE DUCTING





YOU MAY BE SURPRISED WHERE IT LEADS:

- ROOF
- STREET LEVEL
- INTO A ROOM IN THE BUILDING

STLC Result
(at fan):
- **Lead** 26 mg/L

STLC Result
(at street level):
- **Lead** 2.1 mg/L

DRAINAGE SYSTEMS

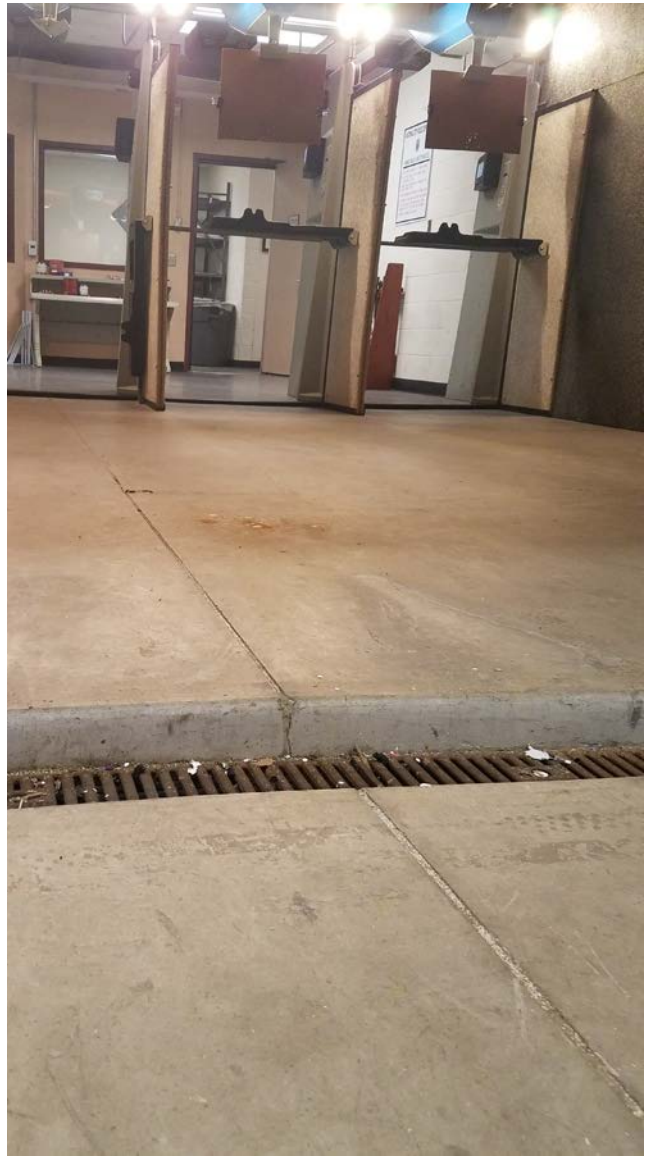
FROM THE ROOF, DUMPSTER, AND SURROUNDING AREAS

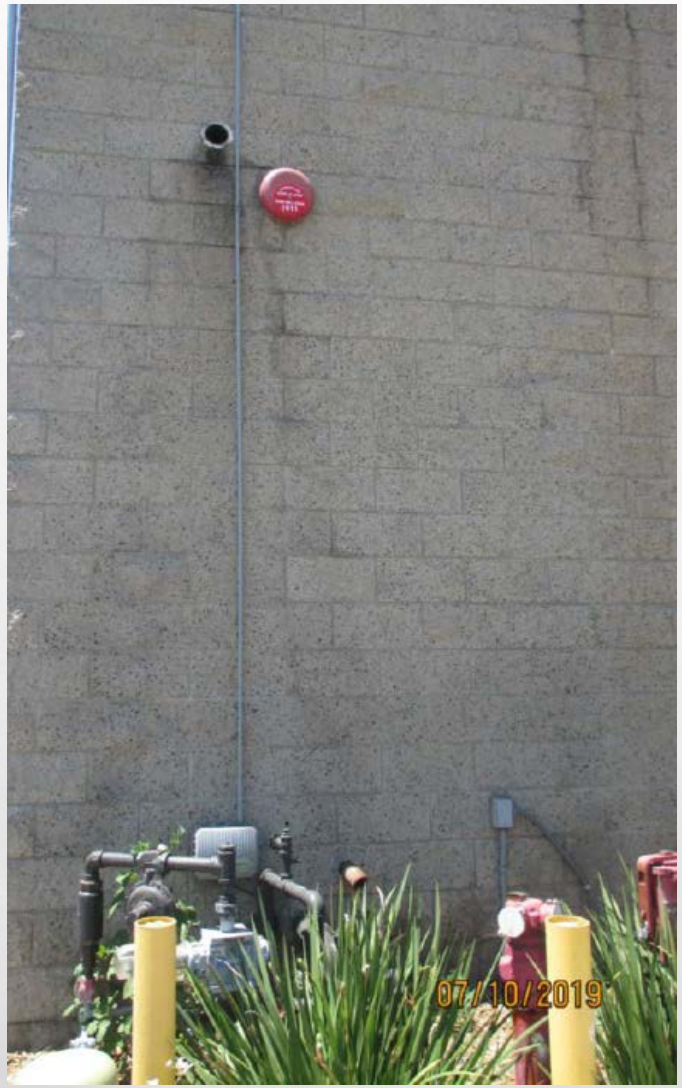
SEWER DRAINS

- RANGE STAFF DID NOT KNOW WHY THERE WAS A DRAIN IN THE RANGE. ENGINEERS NEEDED TO REVIEW BUILDING PLANS

TTLC Results:

- **Lead** 22,000 mg/kg
- **Antimony** 2,000 mg/kg





ROOF DRAINS

- WHEN CONTAMINATION IS PRESENT ON THE ROOF, IT IS LIKELY THE SOIL AND OTHER MEDIA UNDER THE DOWNSPOUTS WILL BE CONTAMINATED AND WILL REQUIRE REMEDIATION

STLC Results:
- **Lead** 5 - 42 mg/L

STORM DRAINS

- LEAD CONTAMINATION DETECTED 210 FEET DOWN STORM DRAIN CONVEYANCE SYSTEM
- ENCROACHMENT PERMIT MAY BE NEEDED

STLC Result:
- **Lead** 5.3 mg/L


* Also failed for Copper & Antimony
16,000* mg/kg
4,200* mg/kg
51,000* mg/kg
5,000 mg/kg
Approximately 210 feet
5.3 mg/L
Kenney St
Kenney St
TTLC HW Threshold for Lead: 1000 mg/kg
STLC HW Threshold for Lead: 5 mg/L


THE BACKSTOP

BACKSTOP

"BULLET TRAP"

GENERAL CONSIDERATIONS:

1. Live-fire range design should:
    a. Promote safe, efficient operation
    b. Include provisions for ease of maintenance; and
    c. Be affordable to construct and maintain

See "Range Design Criteria" published by the US Department of Energy – Office of Health, Safety and Security

RUBBER MEDIA

- PERIODICALLY SIFTED TO REMOVE THE BULLETS, TARGET FRAGMENTS, AND OTHER CONTAMINANTS (HAZARDOUS WASTE)
- TREATMENT FREQUENCY DEPENDS ON RANGE USAGE
- USUALLY CONDUCTED BY AN OUTSIDE CONTRACTOR

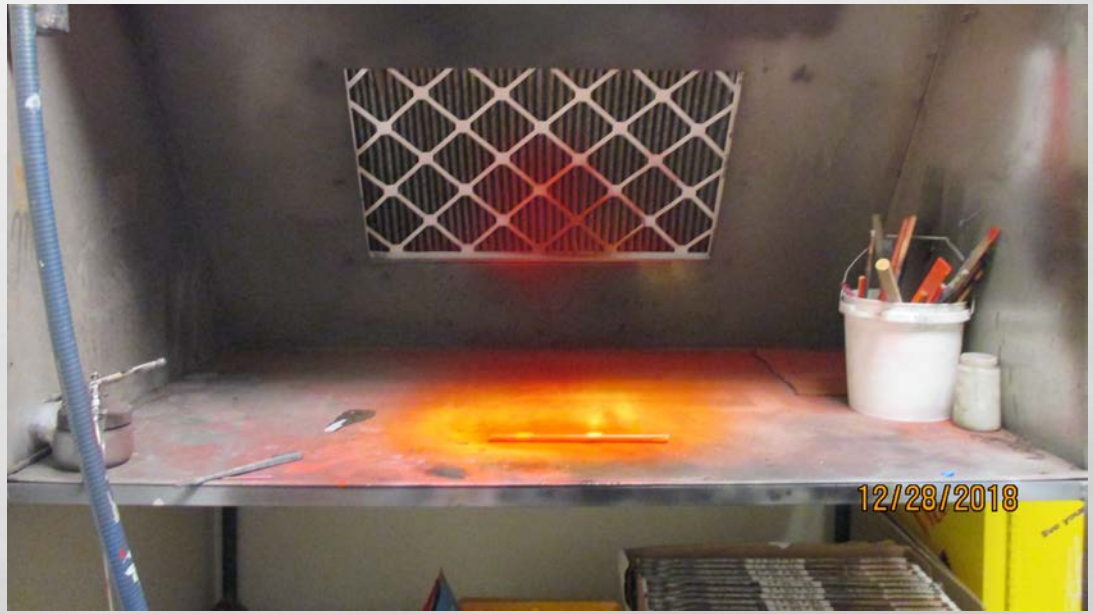
STEEL CLADDING

- ACTS AS A FUNNEL FOR RICOCHETED BULLETS
- BULLETS, DUST AND OTHER FRAGMENTS ARE CAPTURED IN BUCKETS
- BUCKETS ARE PERIODICALLY REMOVED AND DISPOSED (HAZARDOUS WASTE)

GUNSMITHING AND CLEANING

PAINTING AND COATING

- SAME WASTES AS OTHER PAINT-RELATED BUSINESSES
  - Paint waste
  - Solvent waste
  - Filter waste



ULTRASONIC CLEANERS

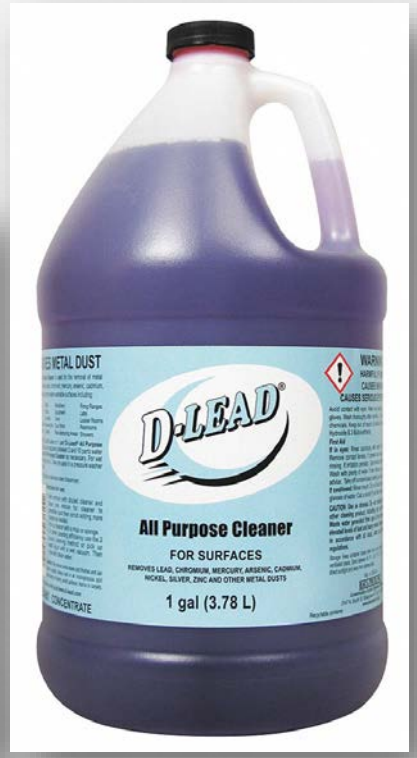
- Acidic, Alkaline or Neutral solutions
- Can be reused until no longer effective
- Frequency of waste disposal is based on usage
- Waste may be corrosive and/or toxic

SOLVENT-BASED

- Wastes typically generated at every use (wipes, etc.)
- Wastes may be ignitable and/or toxic (metals)

OTHER CLEANERS

- HEPA Vacuums
- Wet Vacuums
- Sand-blasters
- Sticky floor mats



A proper waste determination is required for every waste stream

LEAD AS HAZARDOUS WASTE

"When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water"
https://www.epa.gov/sites/production/files/2016-01/documents/hw-char.pdf

FEDERAL REGULATION

- 40 CFR §261.24
- D008 - Lead
- Toxicity is determined through:
  - Toxicity Characteristic Leaching Procedure (TCLP)
    - **5.0 mg/L**

CALIFORNIA REGULATION

- 22 CCR §66261.24
- Toxicity is determined through:
  - Total Threshold Limit Concentration (TTLC)
    - **1,000 mg/kg**
  - Soluble Threshold Limit Concentration (STLC)
    - **5.0 mg/L**

TTLC, STLC, AND TCLP 22 CCR §66261.24

- Laboratory test methods to determine the “Characteristic of Toxicity”
- **10x rule:** If a sample does not fail TTLC, but the concentration is 10 times greater or more than the STLC threshold limit, STLC should also be run - and/or -
- HSC 25141.5(b)(3)(A-C) **TTLC Exclusion for disposal to landfill**, then STLC or TCLP should also be run unless subparagraph B applies.
- **What about TCLP?** Not required in California; but maybe in other states. Only needed if there is a need to prove federal compliance.

Example ONLY	TTLC (CAM-17)	STLC (CAM-17)	TCLP (RCRA-8)
Cost per Sample	$72	$112	$100
Cost per Metal	$6	$6	$6

HSC 25141.5(B)(3)(A)

TTLC EXCLUSION

"Fine powder" means a metal in dry, solid form having a particle size smaller than 100 micrometers (0.004 inches) in diameter. 22 CCR 66260.10

(3) (A) Except as provided in subparagraph (B), a waste that would be classified as hazardous solely because it exceeds total threshold limit concentrations, as defined in regulations adopted by the department, shall be excluded from classification as a hazardous waste for purposes of disposal in, and is allowed to be disposed in, a disposal unit regulated as a permitted class I, II, or III disposal unit, pursuant to Section 2531 of Title 23, and Sections 20250 and 20260 of Title 27 of the California Code of Regulations, if, prior to disposal, the waste is managed in accordance with the management standards adopted by the department, by regulation, if any, for this specific type of waste.

(B) Subparagraph (A) shall not apply to a hazardous waste that is a liquid, a sludge or sludge-like material, soil, a solid that is friable, powdered, or finely divided, a nonfilterable and nonmillable tarry material, or a waste that contains an organic substance that exceeds the total threshold limit concentration established by the department for that substance.

(C) For purposes of this subparagraph (B), the following definitions shall apply:

(i) A waste is liquid if it meets the test specified in subdivision (i) of Section 66268.32 of Title 22 of the California Code of Regulations.

(ii) "Sludge or sludge-like material" means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, but does not include the treated effluent from wastewater treatment plants.

(iii) "Friable, powdered, or finely divided" has the same meaning as used in the regulations adopted by the department pursuant to this chapter.

(iv) "Nonfilterable and nonmillable tarry material" has the same meaning as used in the regulations adopted by the department pursuant to this chapter.

RECYCLING

- **Brass** and **Steel casings** are commonly sent for ‘scrap metal’ recycling 22CCR§66261.6(a)(3)(B)
- **Shotgun shells** can be reloaded; however, this is not common as the process is not cost effective
- **Misfires** *may* not be recycled depending on the recycler. Be sure to ask how they manage these

“Spent material” is any material that has been used and as a result of contamination can no longer serve the purpose for which it was produced without processing. 22 CCR 66260.10

THE INTERVIEW

- WHERE DOES YOUR FILTRATION SYSTEM VENT TO?
- HOW OFTEN DO YOU CHANGE THE AIR FILTERS?
  - WHO CHANGES THEM AND **HOW ARE THEY DISPOSED?**
- HOW DO YOU CLEAN YOUR RANGE?
  - WHAT IS THE FREQUENCY?
  - HOW DO YOU MANAGE THE WASTE?
    - SPENT TARGETS, RANGE SWEEPINGS, SPENT CASINGS AND SHELLS, ETC.)
- HOW DO YOU MANAGE MISFIRES?
- DO YOU PROVIDE GUN CLEANING/SMITHING?
  - HOW DO YOU MANAGE THE WASTE?
    - RAGS, SOLVENTS, ETC.

HMBP REPORTING

MAY OR MAY NOT APPLY DEPENDING ON THE FREQUENCY OF RANGE MAINTENANCE, STORAGE AND DISPOSAL

- **Bulk ammunition** ≥500 lbs (not packaged for retail sale)
- **Lead-contaminated waste (solids)** ≥ 500 lbs
  - Range and backstop maintenance
- **Lead-contaminated waste (liquids)** ≥ 55 gallons
  - Wet vacuuming floors and surfaces
  - Gun cleaning

LESSONS LEARNED

- IT DOESN'T TAKE MUCH TO FAIL TTLC OR STLC FOR LEAD
- THOUSANDS OF POUNDS OF HAZARDOUS WASTES ARE GENERATED BY INDOOR GUN RANGES
- LITTLE TO NO GUIDANCE IS AVAILABLE FOR THE BUSINESSES OR REGULATORS
- INDUSTRY HAS BEEN LARGELY UNDER-REGULATED
- **AIR HANDLING SYSTEMS ARE THE BIGGEST RISK FOR RELEASES**

POTENTIAL VIOLATIONS

WASTE DETERMINATION

3030005

WASTE OBSERVED WITHOUT PROPER LABELING, CONTAINMENT, STORAGE TIMES, TRAINING, DISPOSAL RECORDS, ETC.

UNAUTHORIZED DISPOSAL*

3050002

OBSERVATIONS INCLUDE DISPOSAL OF LEAD (OR OTHER HAZARDOUS WASTES TO THE TRASH. COMMON CAUSES:

- IMPROPER TRAINING OF STAFF
- IMPROPER WASTE DETERMINATION

* Be mindful of HSC 25141.5(b)(3)(A-C) TTLC hazardous waste exclusion

UNREGISTERED TRANSPORTER

3050001

TRANSPORTATION OF HAZARDOUS WASTE BY AN UNREGISTERED HAULER. COMMON CAUSES:

- VENDORS AND CONTRACTORS FOR:
  - Servicing HVAC System
  - Servicing Backstop
  - Range Clean-Up

RELEASE OF HAZARDOUS WASTE

3030030

- TO THE GROUND
- TO STORMDRAINS
- TO THE AIR (HVAC)
- TO SEWER (MOPPING)

OTHER POTENTIAL VIOLATIONS

- Employee Training
- Improper Containment
- Improper Labeling
- Accumulated Too Long
- Operating Without a Permit
- HMBP Violations

SITE ASSESSMENT AND MITIGATION

SAM CLEANUP PROGRAMS

- METHAMPHETAMINE & FENTANYL
- LOCAL OVERSIGHT
- VOLUNTARY ASSISTANCE
- CORRECTIVE ACTION

CORRECTIVE ACTION PROGRAM

Delegation to qualified CUPAs of DTSC's authority to investigate and clean up hazardous materials/waste released from any CUPA-permitted facility

QUALIFIED CUPAS

LOS ANGELES COUNTY CUPA

MERCED COUNTY CUPA

SACRAMENTO COUNTY

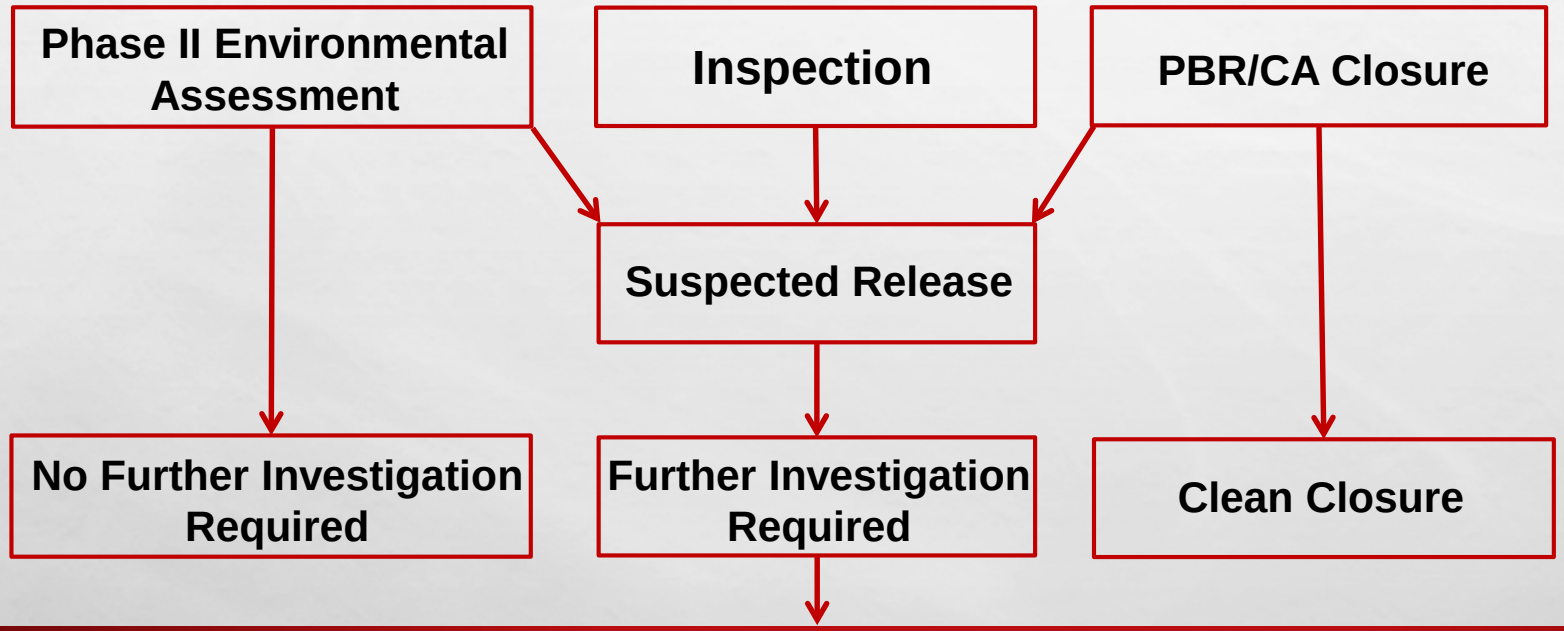
SAN DIEGO COUNTY

SAN MATEO COUNTY

VENTURA COUNTY

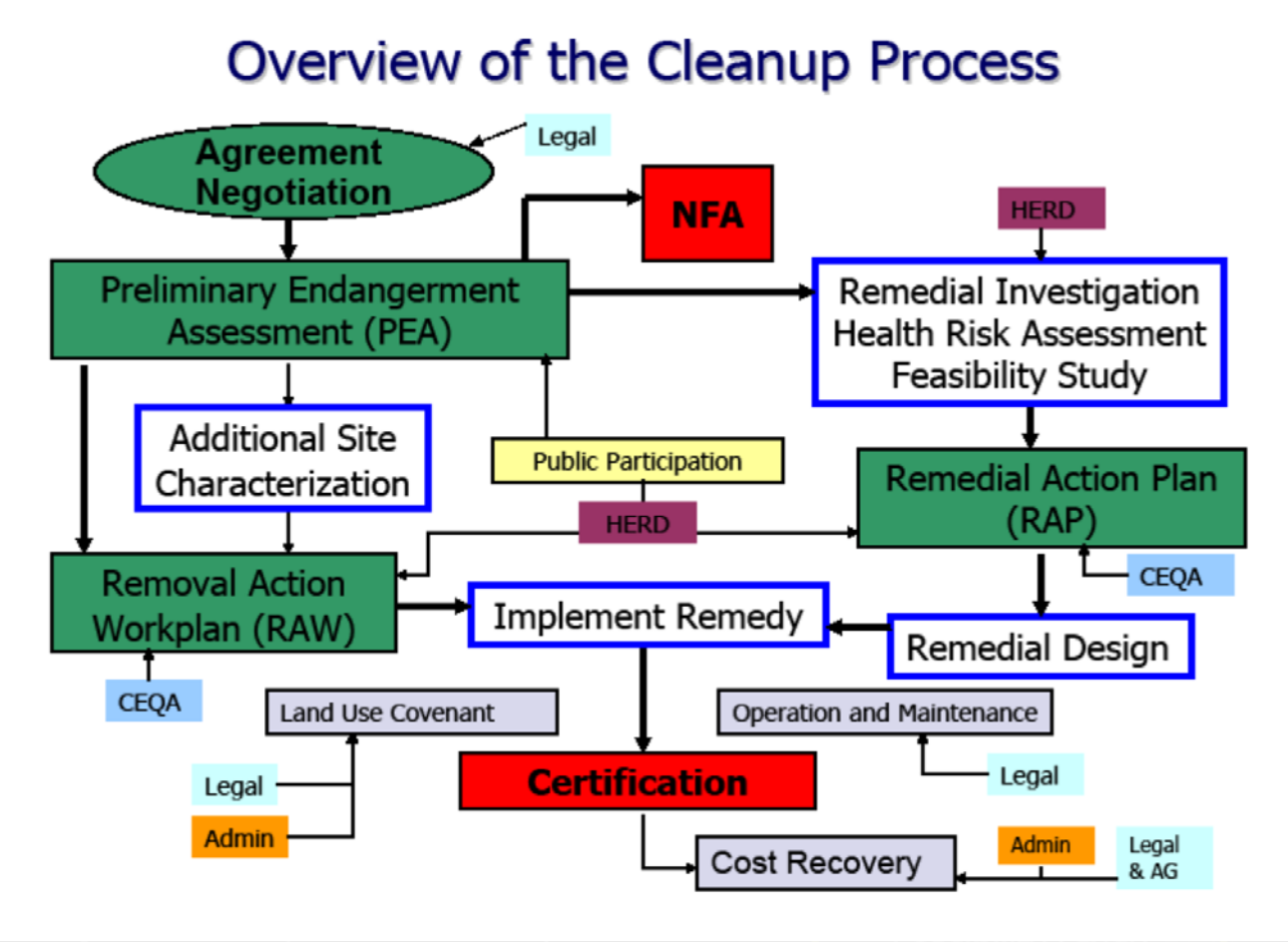
CORRECTIVE ACTION

ALL ACTIVITIES TAKEN TO INVESTIGATE, CHARACTERIZE, EVALUATE, REMOVE, OR REMEDIATE A RELEASE OF HAZARDOUS WASTE OR CONSTITUENTS TO A LEVEL OF HUMAN HEALTH AND ENVIRONMENTAL PROTECTION COMPATIBLE WITH THE USE OF THE PROPERTY.



Corrective Action Required

CORRECTIVE ACTION PROCESS



1. CORRECTIVE ACTION CONSENT AGREEMENT OR CLEANUP ORDER
2. PEA AND CLEANUP GOALS
3. ASSESSMENT
4. REMEDIAL ACTION PLAN AND COMMUNITY HEALTH AND SAFETY PLAN
5. PUBLIC NOTIFICATION
6. REMEDIATION
7. VERIFICATION MONITORING
8. CLOSURE

CONSENT AGREEMENT VS. CORRECTIVE ACTION ORDER

- DEVELOPED COOPERATIVELY
- VOLUNTARILY SIGNED

- NO INPUT FROM RESPONSIBLE PARTY

Consult with Counsel

WHAT'S IN THE AGREEMENT/ORDER?

- AUTHORITY FOR OVERSIGHT
- AGREEMENT TO ADHERE TO TERMS
- FINDINGS OF FACT: INSPECTION FINDINGS, AREAS OF CONCERN, CONSTITUENTS OF CONCERN
- ASSESSMENT AND CLEANUP PROCESS
- TIMELINES
- DISPUTE RESOLUTION
- COST RECOVERY

IN THE MATTER OF:

DEH Case:

CORRECTIVE ACTION CONSENT AGREEMENT

Health and Safety Code Sections 25187 and 25200.14

INTRODUCTION

1.1 The County of San Diego, Department of Environmental Health (DEH) and I enter into this Corrective Action Consent Agreement (Consent Agreement) and agree as follows:

1.2 DEH, a qualified Unified Program Agency was delegated by the Department of Toxic Substances Control (DTSC) to implement and enforce Environmental Assessment and Corrective Action authority pursuant to Health and Safety Code sections 25187, 25187.1, 25200.14, and 25404.1, and California Code of Regulations, Title 22 Chapter 50, article 1 sections 68400.11 et seq.

1.3 Health and Safety Code sections 25187 and 25200.14 authorize DEH to issue a Corrective Action Order when DEH determines that there is or may be a release of hazardous waste or

2.3 On March 21, 2018, DEH staff conducted a scoping meeting and site inspection of the Facility. Based on the site inspection and information available to DEH, DEH has identified areas of concern (AOCs) that may have had releases of hazardous waste or hazardous constituents.

DEH identified five AOCs (areas identified as requiring further evaluation/investigation) as follows:

- AOC #1: Stormwater Conveyance System Sampling
- AOC #2: Soil Sampling
- AOC #3: Wipe Sampling on Exterior Surfaces of Off-site Buildings
- AOC #4: Wipe sampling on Exterior and Interior Surfaces of On-site Building
- AOC #5: Wipe Sampling on Interior Surfaces of Off-site Buildings

DEH concludes that further investigation is needed to determine the nature and extent of any release of hazardous waste or hazardous constituents at the Facility.

The hazardous waste and hazardous constituents of concern at the Facility are primarily lead and other metals associated with shooting range activities.

INDOOR GUN RANGE CASES

- 2 RECENTLY OPENED
- 1 OPENED AND UNDER DTSC OVERSIGHT
- 1 OPEN FOR 2 YEARS

INDOOR GUN RANGES

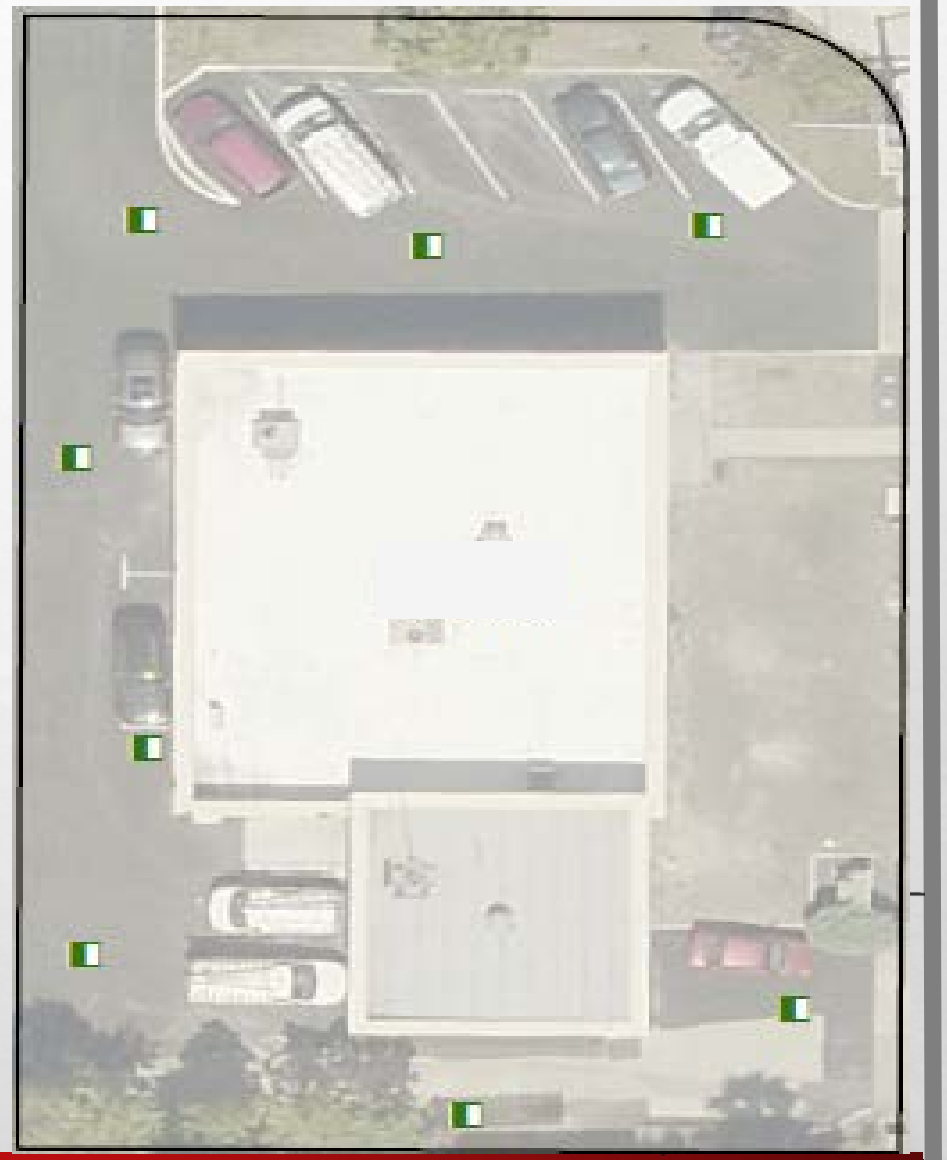
Release of metals-impacted dust from roof vents and mechanical spread of dust

AREAS OF CONCERN

- SOIL
- BUILDINGS
- PAVED SURFACES
- STORM DRAINS
- SURFACE WATERS

ASSESSMENT PROCESS

- Start at facility and expand outward
- Soil assessment/sampling
- Paved and building surfaces (wipe samples)
- Storm drains/surface water
- Consent needed from adjacent property owners
- Approved workplans required



CALIFORNIA DEPARTMENT OF TOXIC SUBTANCES CONTROL (DTSC)
HUMAN AND ECOLOGICAL RISK OFFICE (HERO)

HUMAN HEALTH RISK ASSESSMENT (HHRA) NOTE

HERO HHRA NOTE NUMBER: 3, DTSC-modified Screening Levels (DTSC-SLs)

RELEASE DATE: April 2019

ISSUE: DTSC has developed modified screening levels based on the U.S. Environmental Protection Agency (USEPA) Regional Screening Levels (RSLs) for use in the human health risk assessment process at hazardous waste sites and permitted facilities. HHRA Note 3 is periodically updated and users should always check the DTSC website for the most recent versions, including other HHRA Notes.[a]

CLEANUP GOALS SOIL

COMMERCIAL LAND USE

LEAD	320 mg/kg
COPPER	47,000 mg/kg
ANTIMONY	470 mg/kg
ARSENIC	0.36 mg/kg
ZINC	350,000 mg/kg

CLEANUP GOALS

SURFACES

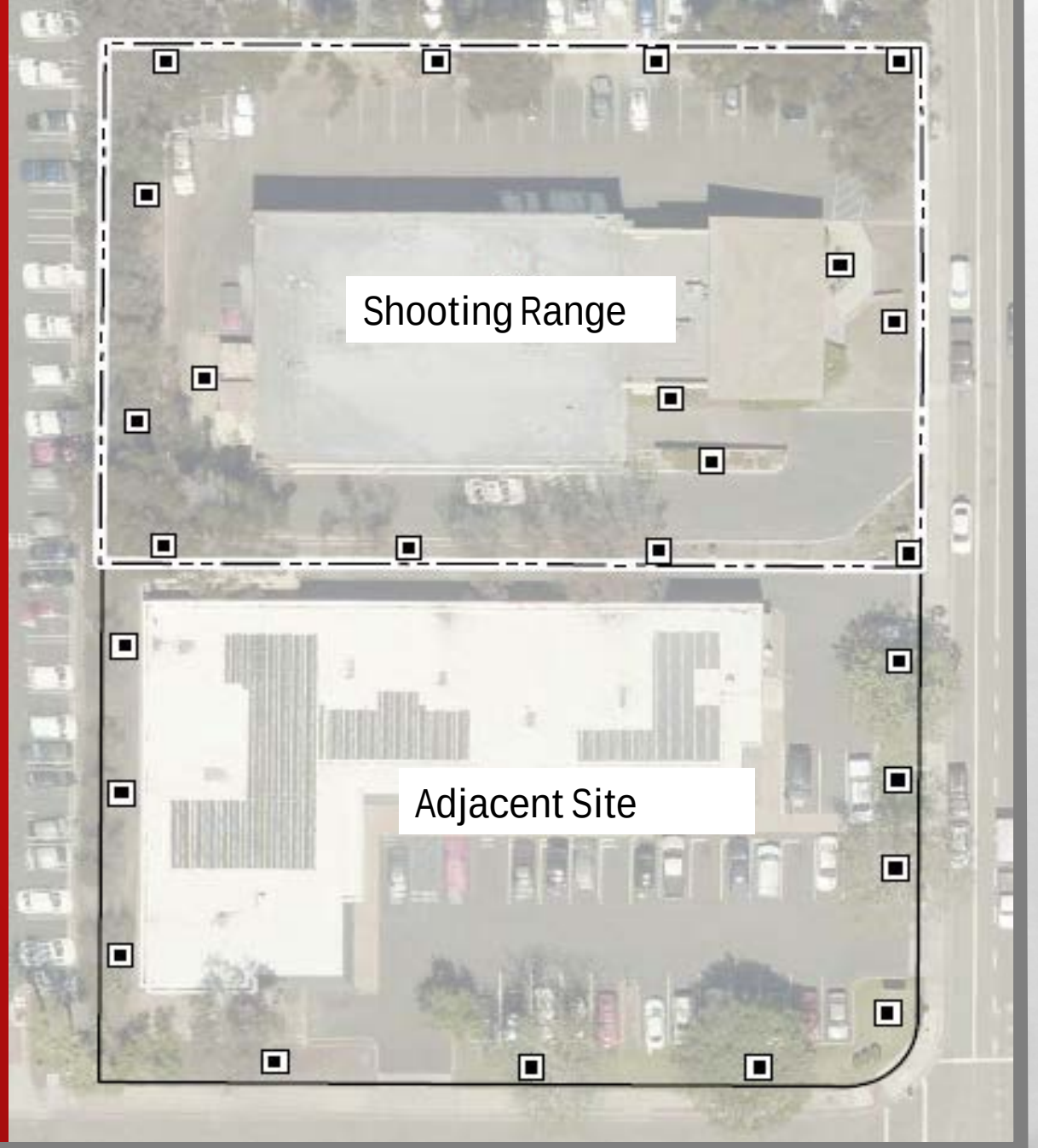
DERIVED BY OEHHA

LEAD	400 µg/ft^2
COPPER	110,000 µg/ft^2
ANTIMONY	198 µg/ft^2
ARSENIC	7.1/0.6 µg/ft^2
ZINC	430,000 µg/ft^2

OEHHA
California Office of Environmental Health Hazard Assessment

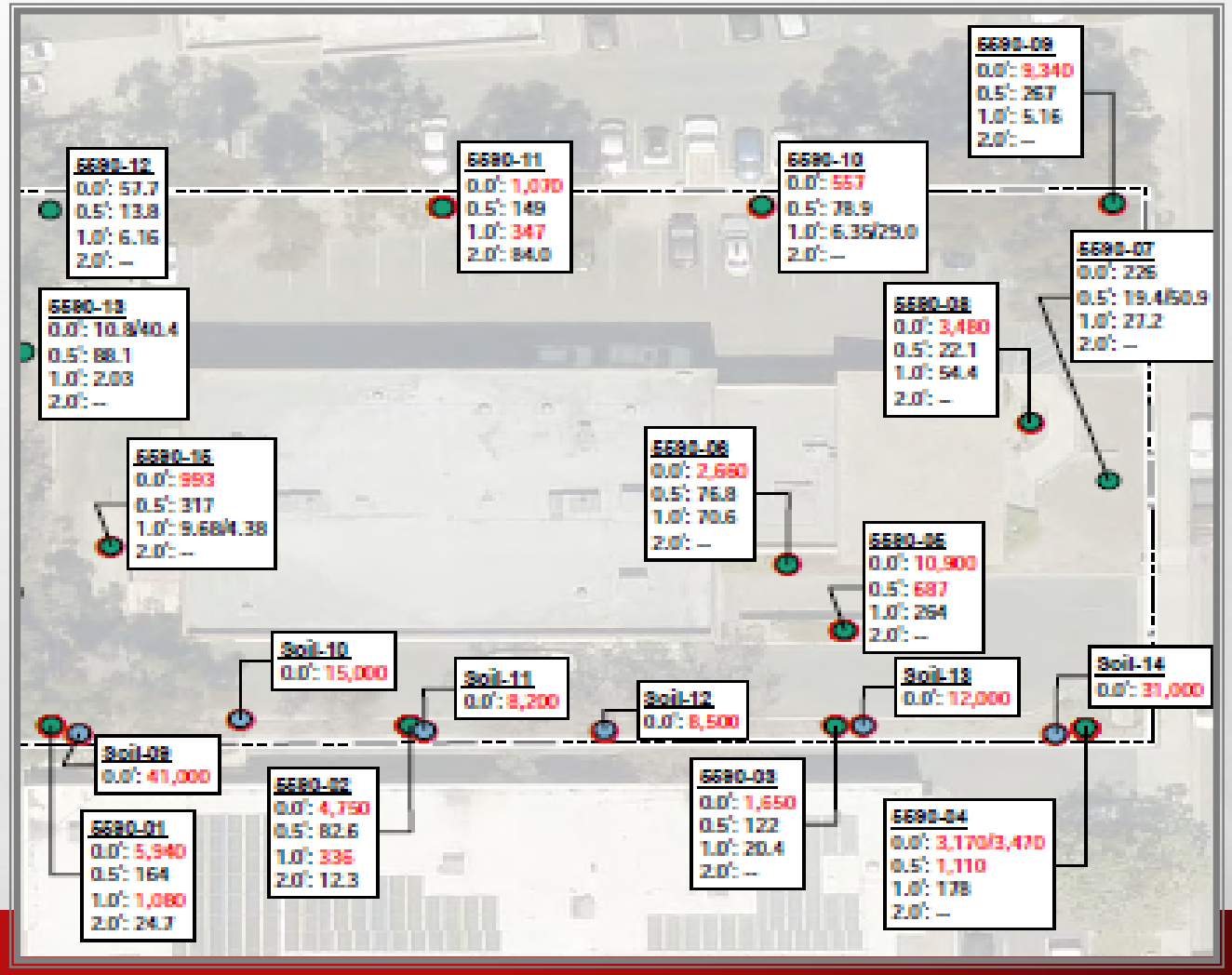
SOIL ASSESSMENT

- Sample in multiple locations
- Sample at multiple depths in each location
- Start at the surface and sample until soil is no longer impacted



SOIL ASSESSMENT RESULTS

- Commercial screening levels exceeded for lead and arsenic
- Lead concentrations up to 10,900 mg/kg
- **Soil sampling must be completed on adjacent properties**



SOIL ASSESSMENT

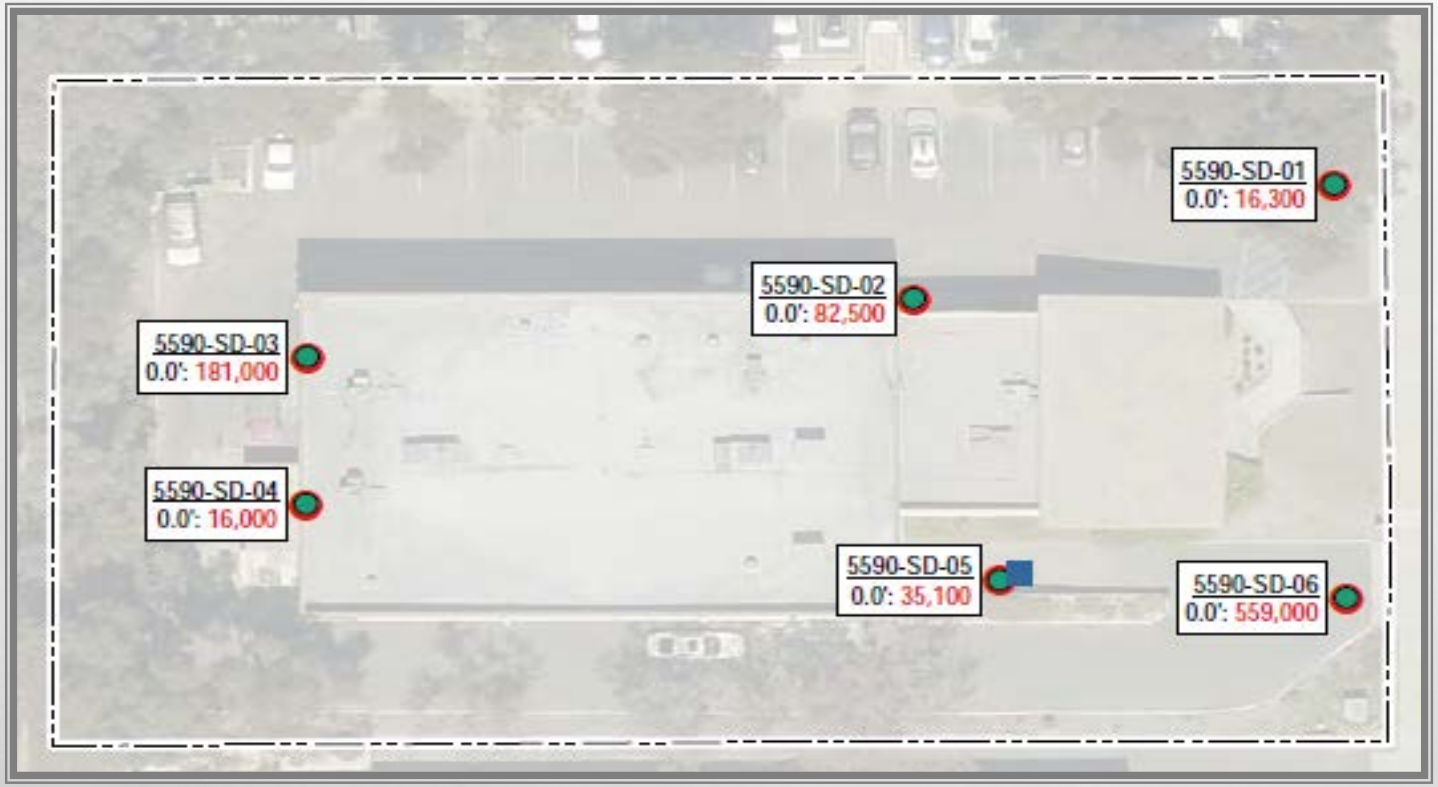
How far do we go?

- Lead exceeds screening levels on properties within blue boundary
- Two adjacent properties cleared
- **Further assessment needed in all other directions**

ASSESSMENT OF BUILDINGS AND PAVED SURFACES

- Evaluate if surface soil lead concentrations exceed screening levels
- Exterior first, interior if warranted
- Collect surface wipe samples
- Sample area is typically 1 ft^2
- Results reported in $\mu g/ft^2$

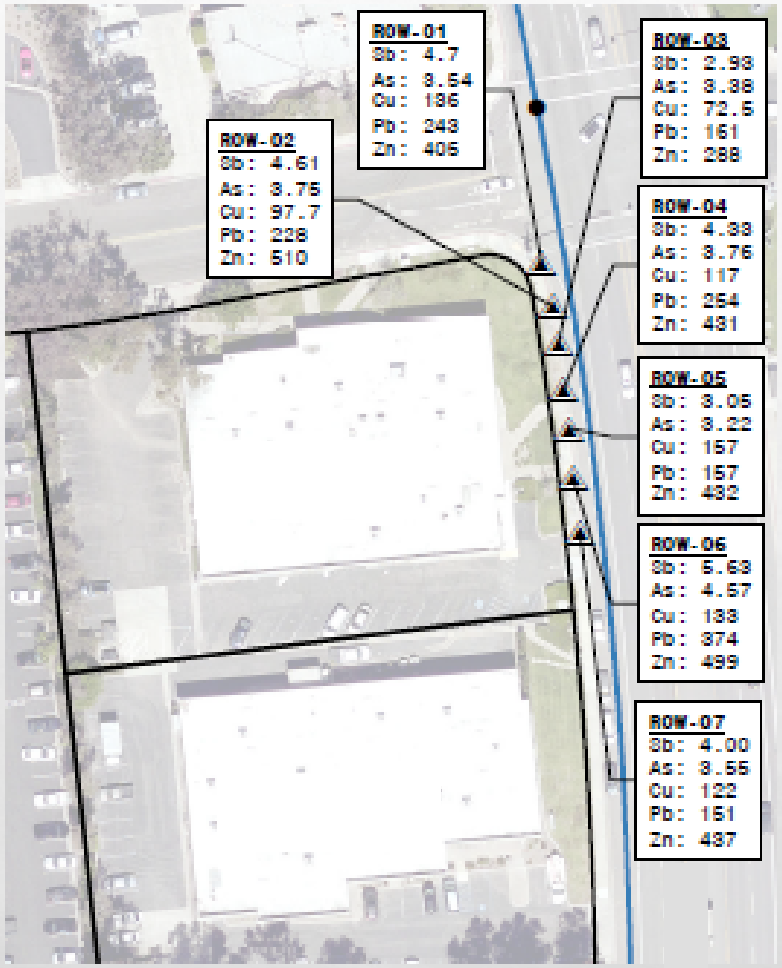
ASSESSMENT OF STORM DRAINS AND SURFACE WATER

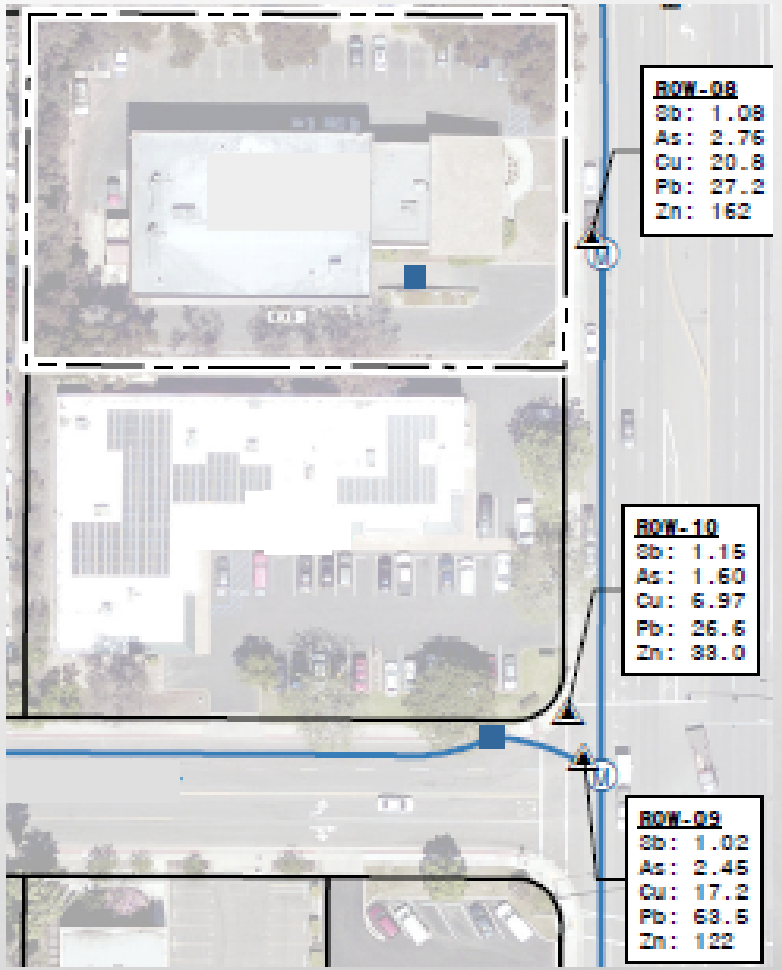


- Start at facility
- Sample sediment in or adjacent to onsite drainage pipes
- **Results show assessment of storm drains needed**

Assessment Of Storm Drains

- Sample sediment upgradient and downgradient of facility
- Lead in upgradient samples is higher than in downgradient samples
- **No further assessment of the storm drain system and receiving waters is needed**





UPGRADIENT DOWNGRADIENT

REMEDIATION PROCESS

- Clean, remove, or encapsulate impacted soil and surfaces
- Complete confirmation sampling
- Approved workplan required
- Approved Community Health and Safety Plan required

COMMUNITY HEALTH & SAFETY PLAN

- Required prior to remediation
- Implemented by consultant

COMPONENTS

- Public notification
- Site security
- Site monitoring

PUBLIC NOTIFICATION

burn ash, and petroleum
beginning January 2008.
The excavation activities
Primary potential hazards
associated with Site work,
tentially lead-bearing soil
will be used to minimize
be performed frequently.

OR OTHER SAFETY

HIS SITE, PLEASE

IELD PERSONNEL.

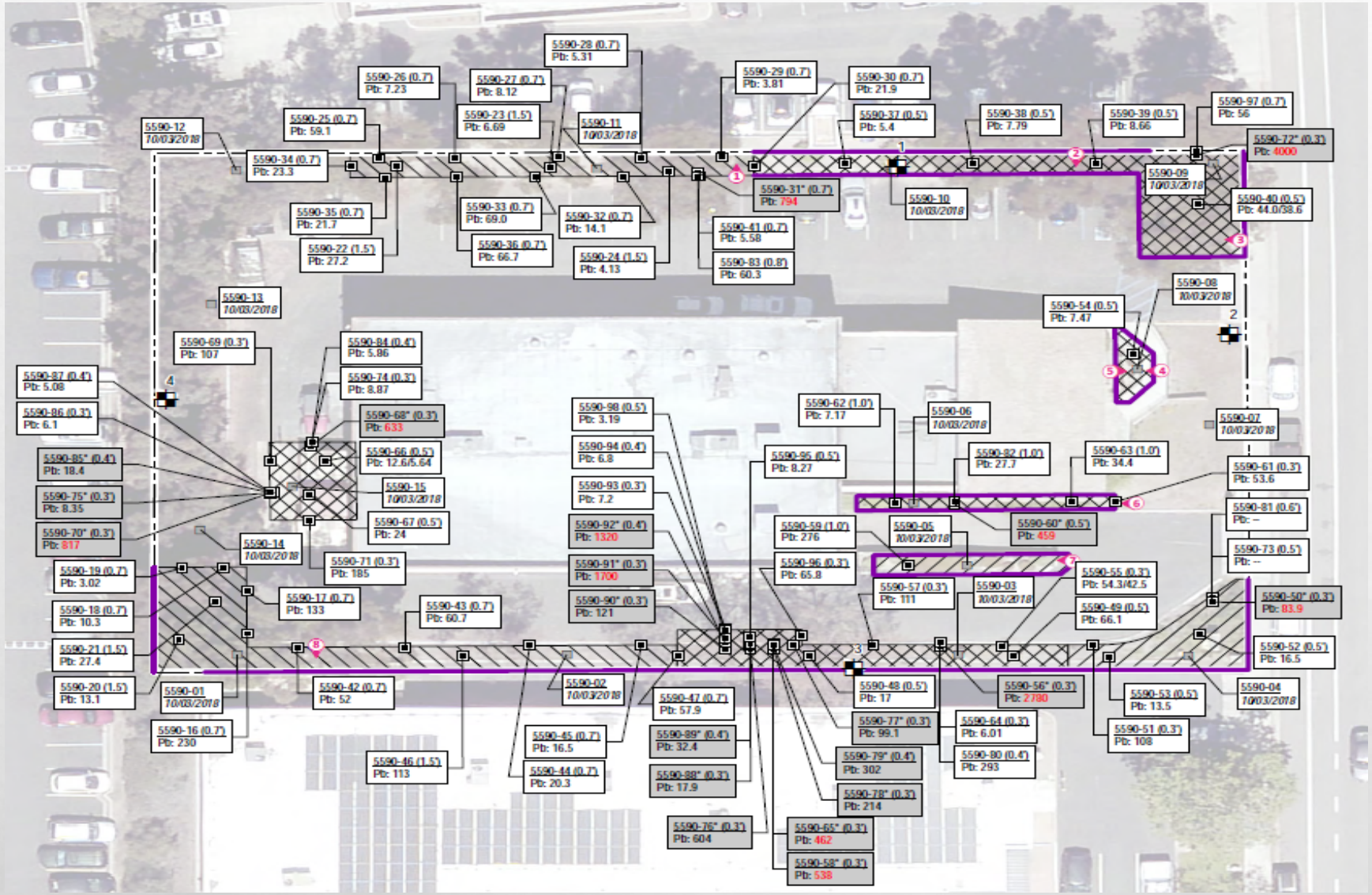
ongoing work, please call:

	Name/Address	Phone
Developer	TBD	
tor	TBD	
Environmental Consultant	Chuck Pryatel SCS Engineers	(858) 571-5500
San Diego Department of Environmental Health	Theresa Sherman	(619) 338-2258

If further assistance is required, please contact the following agencies:

SOIL REMEDIATION

REMOVAL: EXCAVATION OF METALS-IMPACTED SOIL

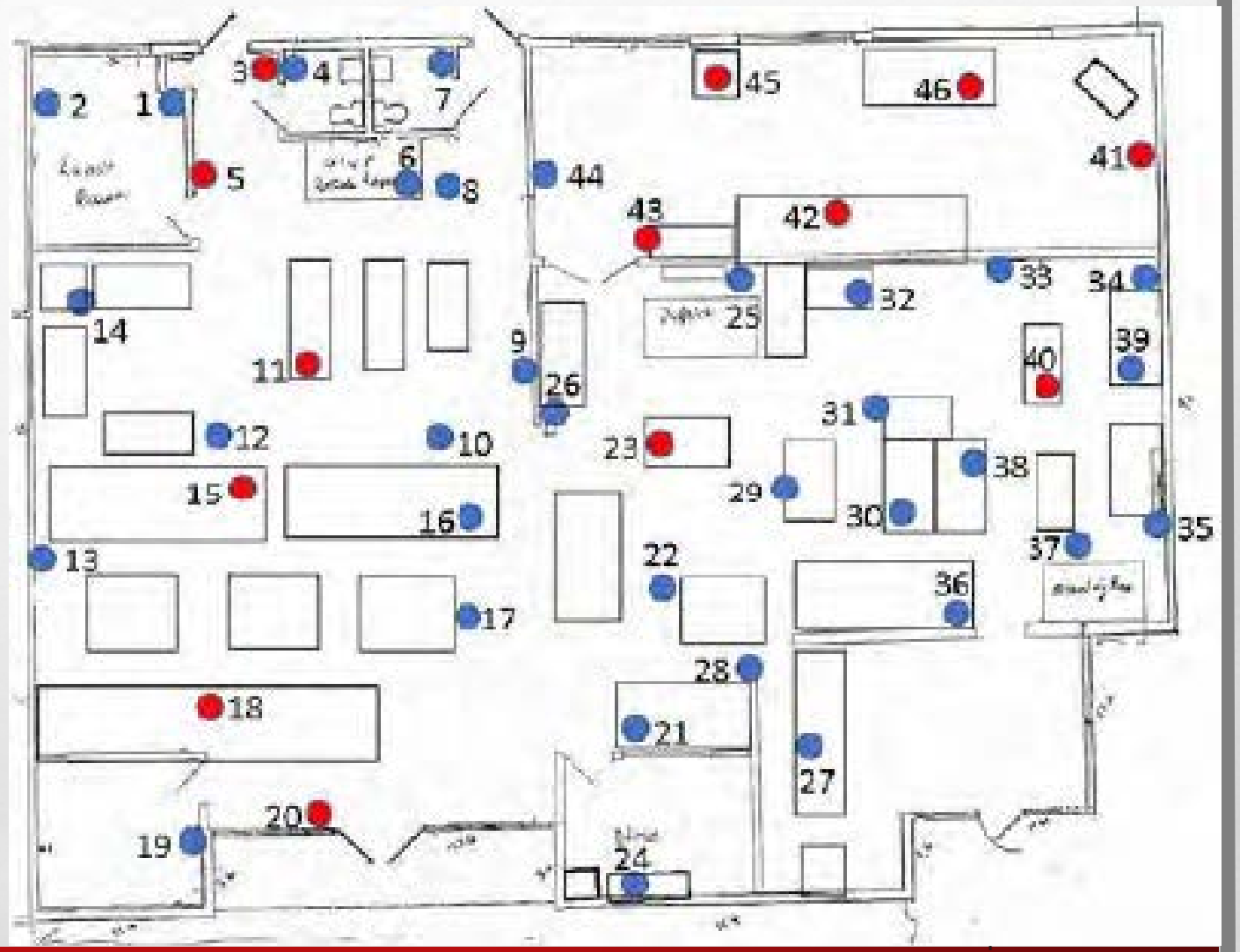


CONFIRMATION SAMPLING

- Ongoing during excavation
- Metals left in place must not pose a health risk

REMEDIATION OF SURFACES

- Wash and/or encapsulate
- Resample



TAKE HOME MESSAGE

- **Half of indoor ranges inspected had a release of metals-impacted dust**
- **Dust is mobile and impacts adjacent properties**
- **Cleanup is expensive and takes years**

PUBLIC HEALTH RISK

GEOTRACKER

- State database that contains sites with cleanup cases
- Available to public
- All our shooting range cases and documents are on GeoTracker

OUTDOOR GUN RANGES

- One previous case opened in 2003 and closed in 2013
- Skeet and trap shooting range operated for 30 years
- 31 acres impacted by shooting range activities
- Soil impacted with lead pellets and polynuclear aromatic hydrocarbons (PAHs) from clay pigeon debris
- Ecological and groundwater assessments were necessary
- 90,000 yd^3 of impacted soil were excavated and encapsulated in a 4-acre area
- Land Use Covenant was recorded to limit future use of the encapsulation area

OUTDOOR RANGES

BEST MANAGEMENT PRACTICES FOR LEAD OUTDOOR SHOOTING RANGES, EPA-902-B-01-001, REVISED JUNE 2005

To be continued...

GUN RANGE CASE STUDY

- GOVERNMENT ONLY
  - THURSDAY, FEBRUARY 6 @ 10 AM
  - HARBOUR ROOM
- DETAILED INSPECTION, SITE ASSESSMENT, MITIGATION, AND CRIMINAL ENFORCEMENT INFORMATION

QUESTIONS?

COUNTY OF SAN DIEGO - DEPARTMENT OF ENVIRONMENTAL HEALTH

HAZARDOUS MATERIALS DIVISION

Arleen Gurfield, MPH, REHS
Supervising Environmental Health Specialist
arleen.gurfield@sdcounty.ca.gov
(858) 505-6779

Alaaeddine Zahra
Environmental Health Specialist III
alaaeddine.zahra@sdcounty.ca.gov
(858) 525-5834

Marie Moreau
Environmental Health Specialist
marie.moreau@sdcounty.ca.gov
(858) 525-3204

LAND AND WATER QUALITY DIVISION – SITE ASSESSMENT AND MITIGATION

Colleen Hines
Supervising Environmental Health Specialist
colleen.hines@sdcounty.ca.gov
(858) 505-6874

Ewan Moffat
Hydrogeologist
ewan.moffatt@sdcounty.ca.gov
(858) 505-6856