WHAT IS THAT?

THE SEQUEL

Hazard Categorization

TPSA – 18th Annual Pesticide Stewardship Conference

Safety Requirements

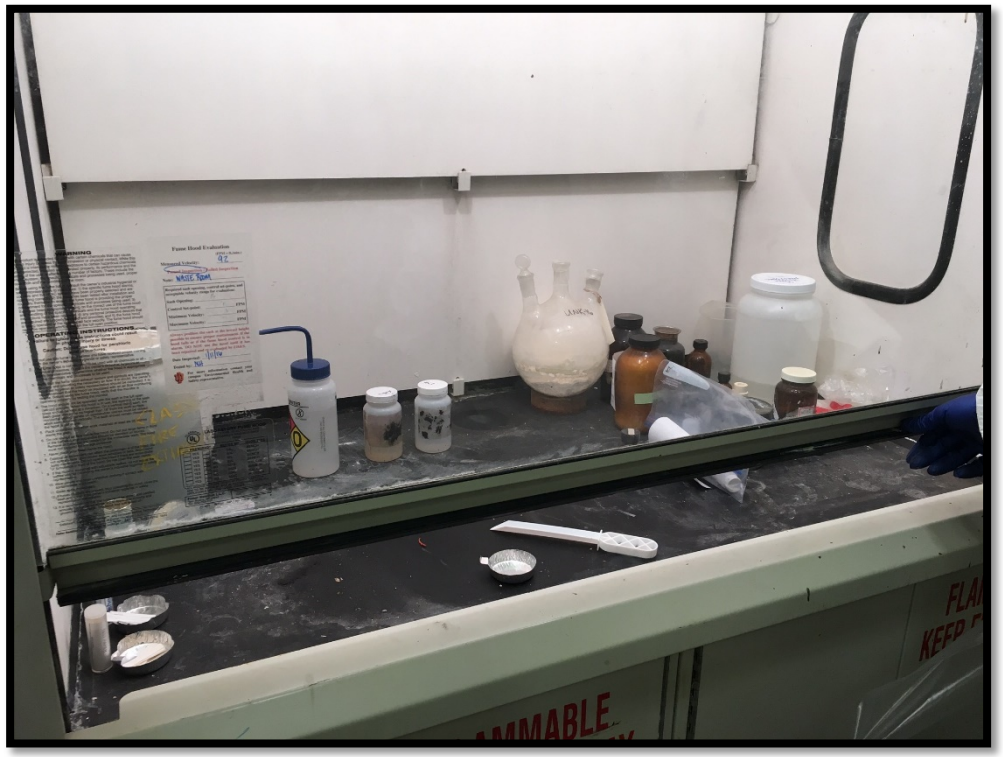
- If chemist
  - Not comfortable performing the testing, OR
  - Identifies something that looks dangerous
- STOP IMMEDIATELY
- Recommend that additional personnel be present whenever unknown testing is being performed

Safety - PPE

- Adequate protection
  - Full-face respirator
  - Protective gloves
  - Tyvek or coveralls (minimum)
- Site specific health & safety plan (HASP)
- 4 gas meter

Safety - Environment

- Proper ventilation
  - Hood
  - Roped off area outdoors
- Clear area of hazards
- Emergency equipment readily available
  - Fire extinguisher
  - Eyewash
  - First aid kit
  - Fire blanket/safety shower



Purpose of Testing

- Whenever a waste is considered an unknown
  - Missing or illegible label
  - Trade name (no component information)
- Determine physical/chemical properties
- Assign DOT hazard class for transportation
- Possible waste codes for disposal
- Heritage policy – incineration only

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DOT HAZARD CLASS

Class 1—Explosives

49 CFR 173.50

Division	Description
1.1	Mass explosion hazard
1.2	Projection hazard explosives
1.3	Fire hazard & either minor blast or projection hazard or both
1.4	Minor blast hazard
1.5	Insensitive mass explosion
1.6	Extremely insensitive

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Class 2—Gases

49 CFR 173.115

- Division 2.1 Flammable gases
- Division 2.2 Non-flammable gases
- Division 2.3 Toxic/Poison gases

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Class 3—Flammable Liquids 49 CFR 173.120

- Flash point of <141°F
- Combustible liquids have a FP between 141°F & 200°F
- Reclassify materials with FP 100°F & 140°F as combustible
  - 49 CFR 173.150(f)

Class 4—Flammable Solids 49 CFR 173.124

- Easily ignited, spontaneously combustible, or react with water to emit flammable gases
  - Division 4.1 Flammable solids
  - Division 4.2 Spontaneously combustible
  - Division 4.3 Dangerous when wet materials

49 CFR 173.127 & 128

Class 5—Oxidizers & Organic Peroxides

- Division 5.1 - Oxidizers
- Division 5.2 - Organic peroxides

- Materials that act as a source of oxygen, which can increase the hazard of a fire if they are involved

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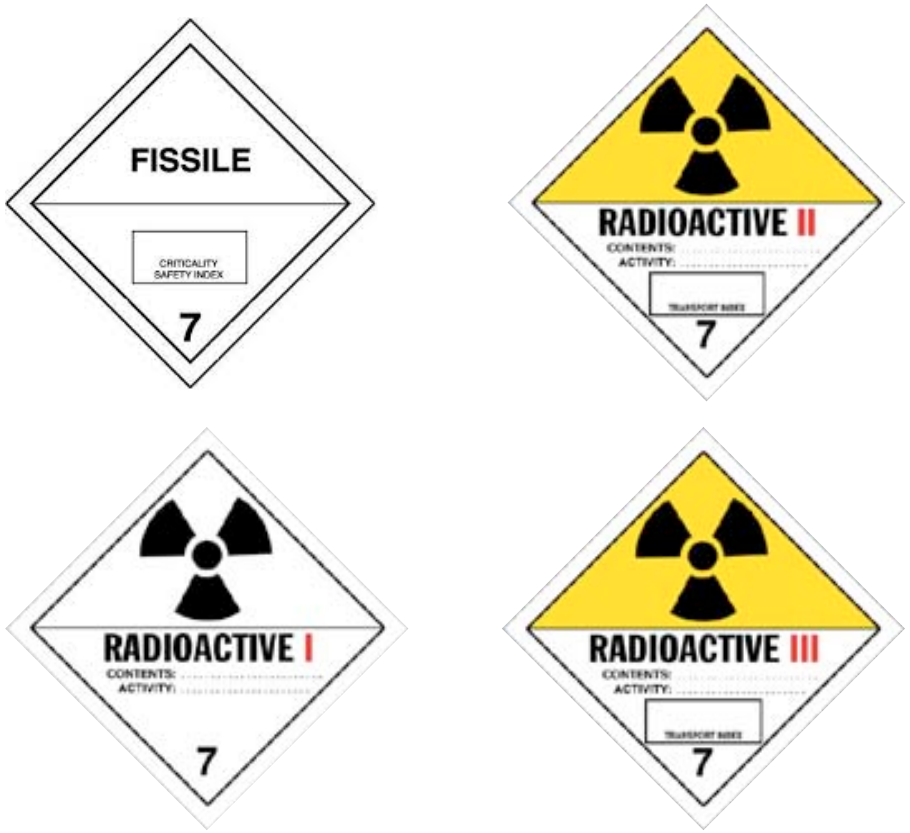
CLASS 6—TOXIC/POISON 49 CFR 173.134 & 128

- Substances that are poisonous or infectious to humans and/or animals
  - Division 6.1
    - Oral Toxicity
    - Dermal Toxicity
    - Inhalation Toxicity

  - Divisions 6.2 - Infectious Substance
    - Organisms that cause disease in humans and/or animals
- Poison is for domestic only

CLASS 7—RADIOACTIVE 49 CFR 173.403

- Products that emit radiation or sub-atomic particles



Class 8—Corrosives

49 CFR 173.136

- Liquids or Solids
- Materials
  - Cause full thickness destruction of skin
  - Severely corrodes aluminum or steel
- Unlike EPA no pH is defined

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CLASS 9—MISCELLANEOUS

49 CFR 173.140

- Hazardous substances
- Hazardous waste
- Marine pollutants
- Elevated temperature materials

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HAZARDOUS WASTE

Federal Hazardous Wastes

40 CFR 261

Non-Specific Source HW (F listed)

Specific Source HW (K listed)

Commercial Chemical Products (U and P listed)

Flammable (D001)

Corrosive (D002)

Reactive (D003)

Toxic (D004 – D043)

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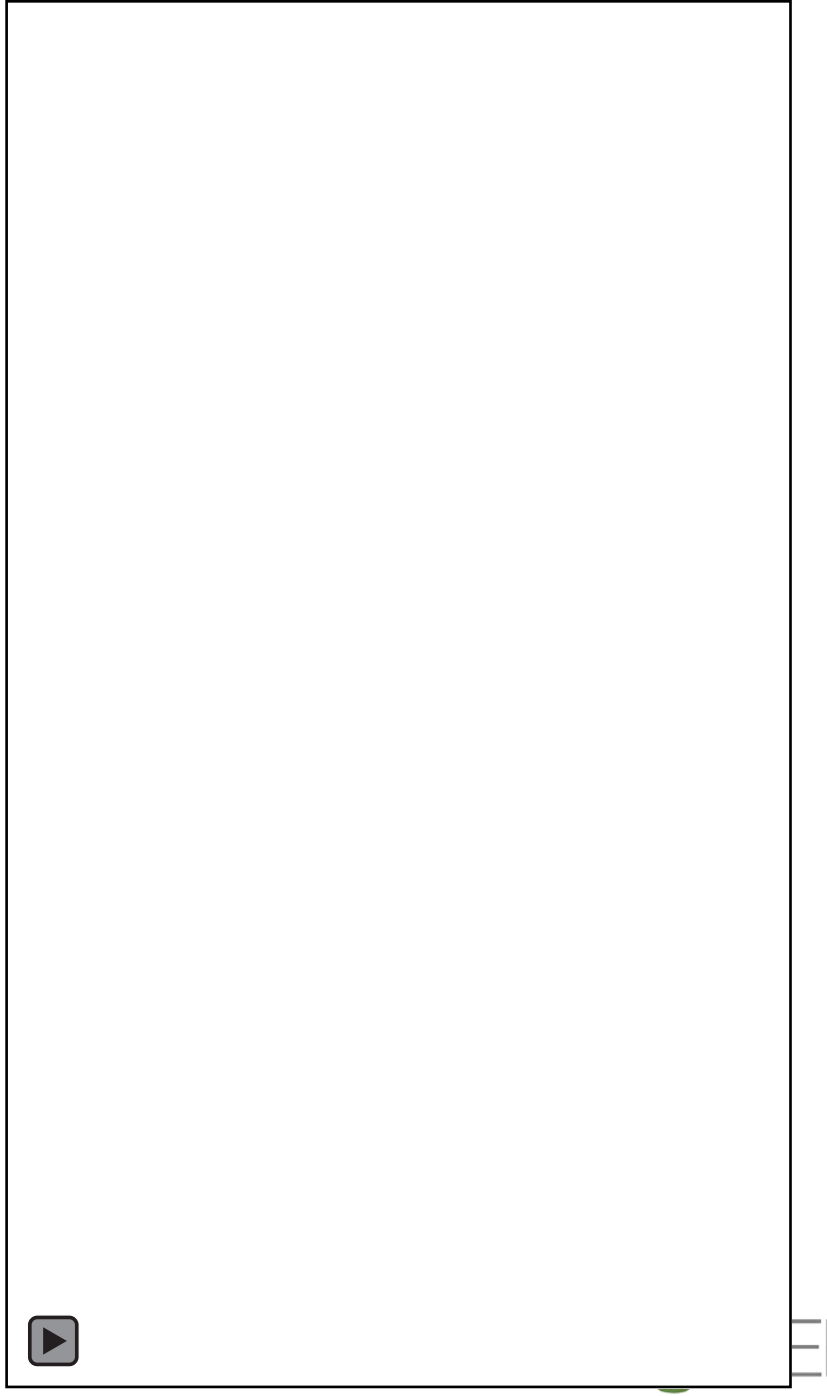
The Things You See



TESTING PROCEDURES

Prior to any Testing

- Visual inspection of the containers
  - Watch for colors when evaluating
- Note warning items (peroxide formation, age of container, type of container and lids)
- Question the generator
  - Prompting questions may illicit information not previously provided

Unknown Interview Questions: Pesticides

- Material origin?
- Material use?
- Has the material been mixed/diluted?
- Virgin/unused material?
- Material age?
- Why disposing?
- How certain are you of the contents?

Recommended Testing Supplies

- Small propane or butane torch
- Lead acetate paper (sulfides)
- pH test paper
- Potassium iodide test strips (oxidizer)
- CYANTESMO test strips
- Disposable Plastic Test Tubes with stoppers
- PCB Testing kit(s), Peroxide test strips
- EXPRAY testing kit
- Hydrochloric acid, 5%
- Sulfuric acid
- Distilled Water
- Disposable pans
- Metal/plastic spatulas
- Disposable pipettes
- Plastic baggies for disposal of testing debris

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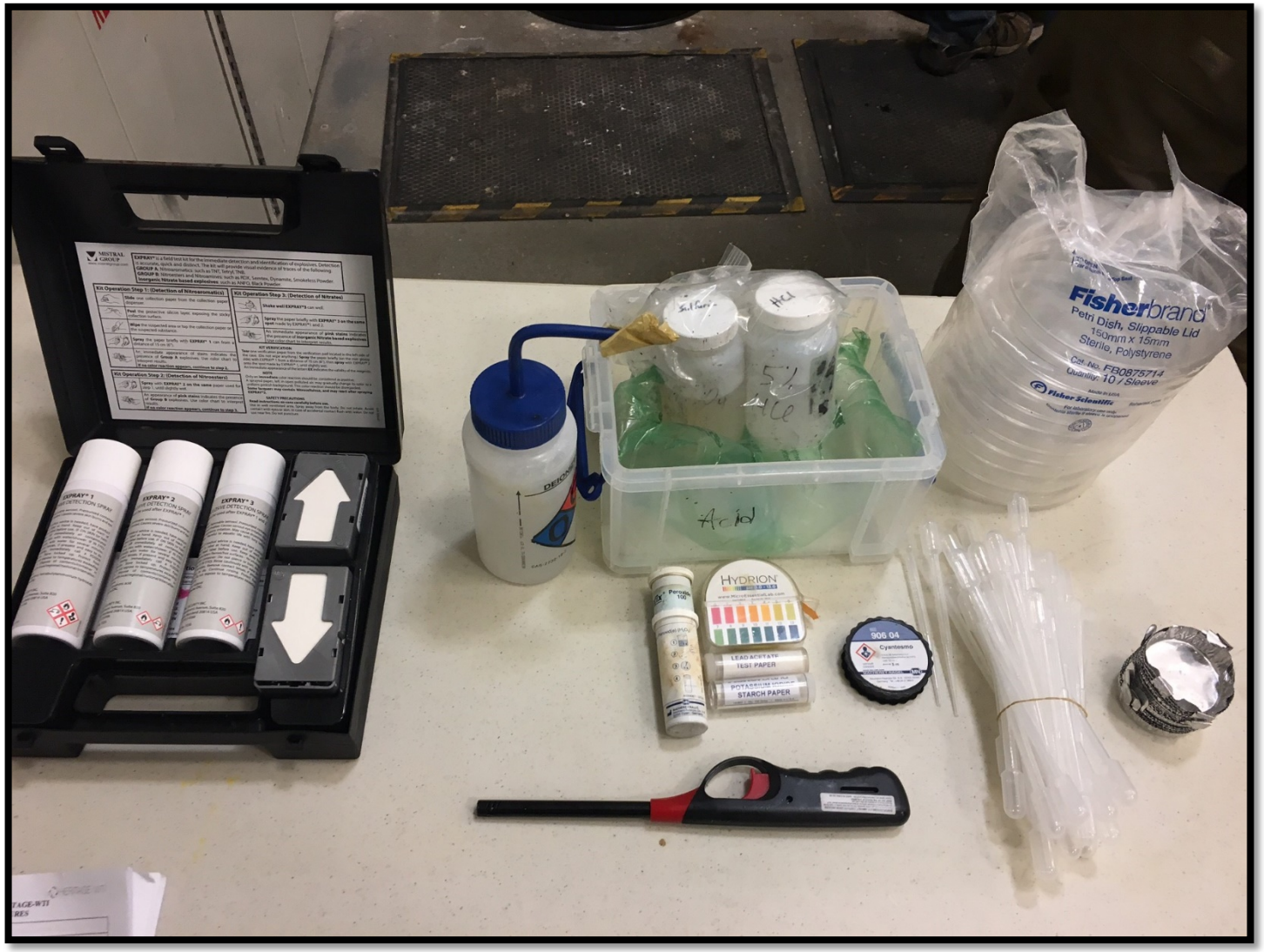
Unknown Kit



RADIOACTIVITY

- Geiger Counter
- Performed first on any unknowns
- Turn on radioactivity monitor, check battery
- If battery registers ok, set monitor at 1X and take reading from distance of the material being tested
  - Normal background reading
- Take probe and scan material being tested
  - If reading is above normal background reading, stop, set material aside, do no further testing
- Material cannot be incinerated

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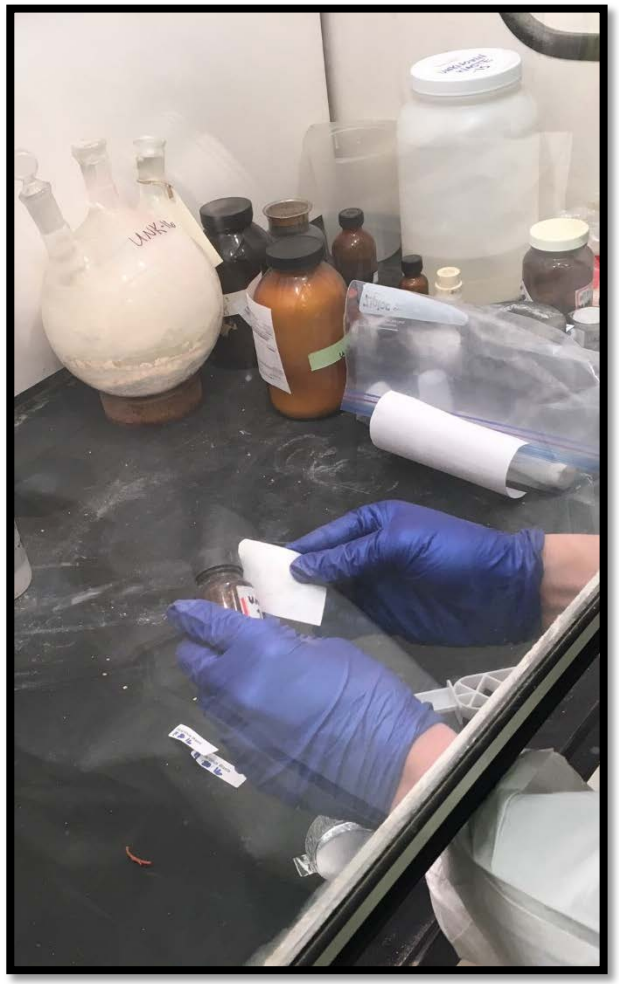
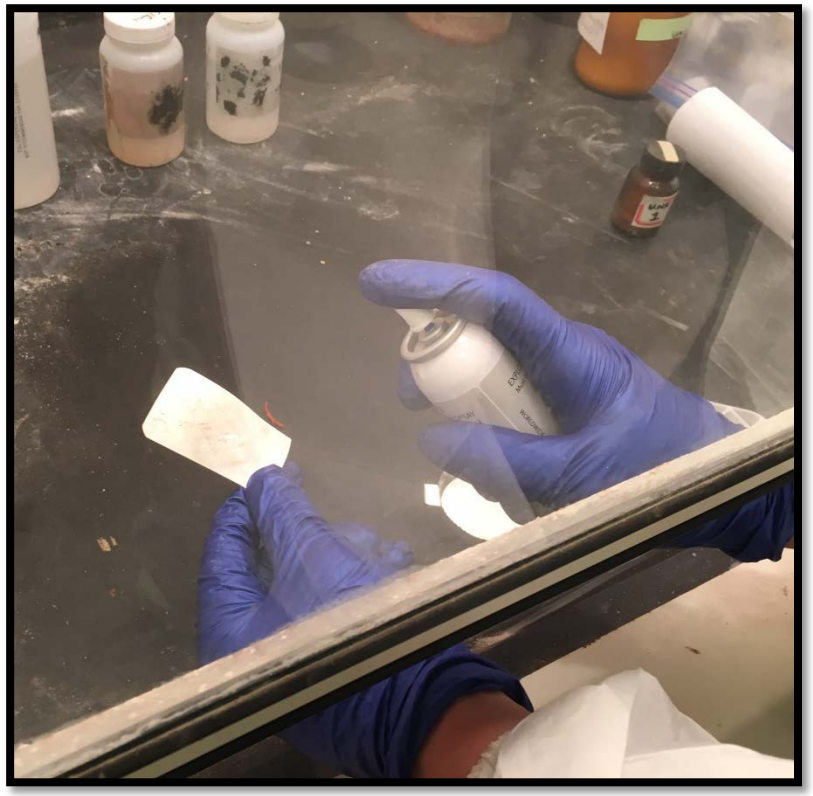
Explosive or High Hazard Testing

Use EXPRAY detection pack

- Group A explosives
  - TNT, TNB
- Group B explosives
  - Semtex, H, RDX, C4





Water Reactivity

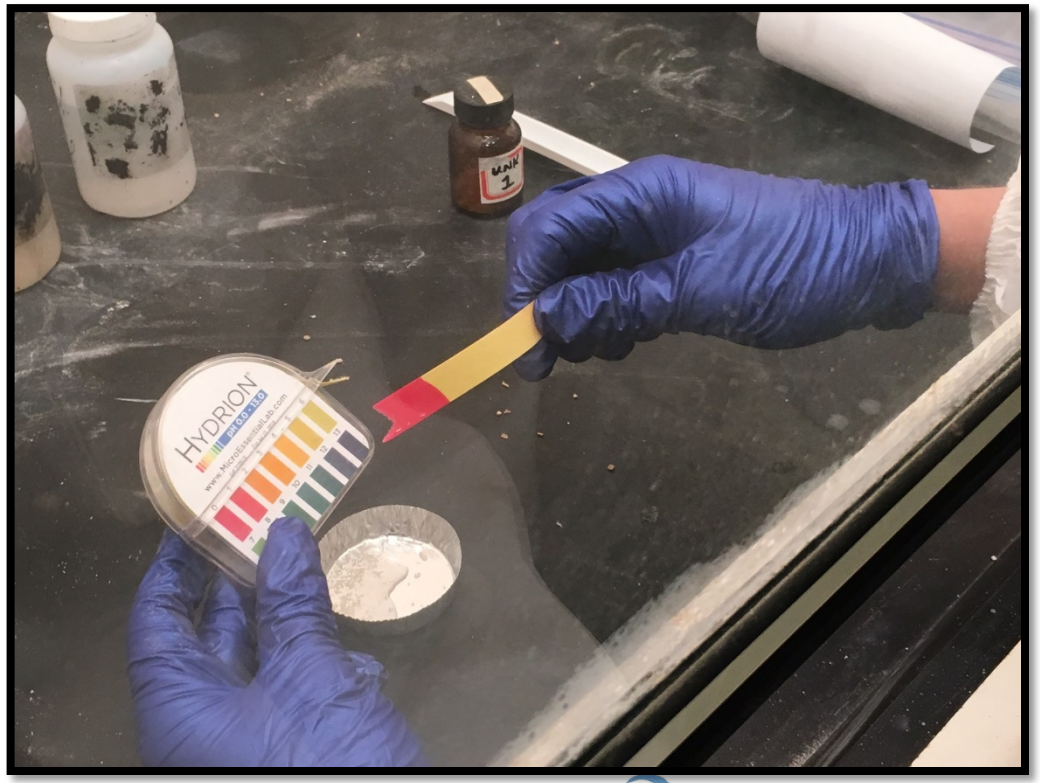
- Remove 5 ml/5g using spatula/pipette
- Place the material into pan
  - Add few drops distilled water
- Watch for reactions:

Observation	Results
Dissolves in Water	Water soluble
Forms a non-clear aqueous solution	Miscible, probably organic
Evolves, bubbles, splashes, fumes, evolves foam or heat	Material is water reactive, probably an inorganic metal if solid, organic if liquid - D003

pH Test

- Dip pH paper into sample from water reactivity
- Check color change against chart

Observation	Results
0-4	*Acidic* – < 2.0 is D002
5-9	*Neutral* – Reading 5-7 slightly acidic *Neutral* – Reading 7-9 slightly alkaline
10-14	*Alkaline*- >12.5 is D002



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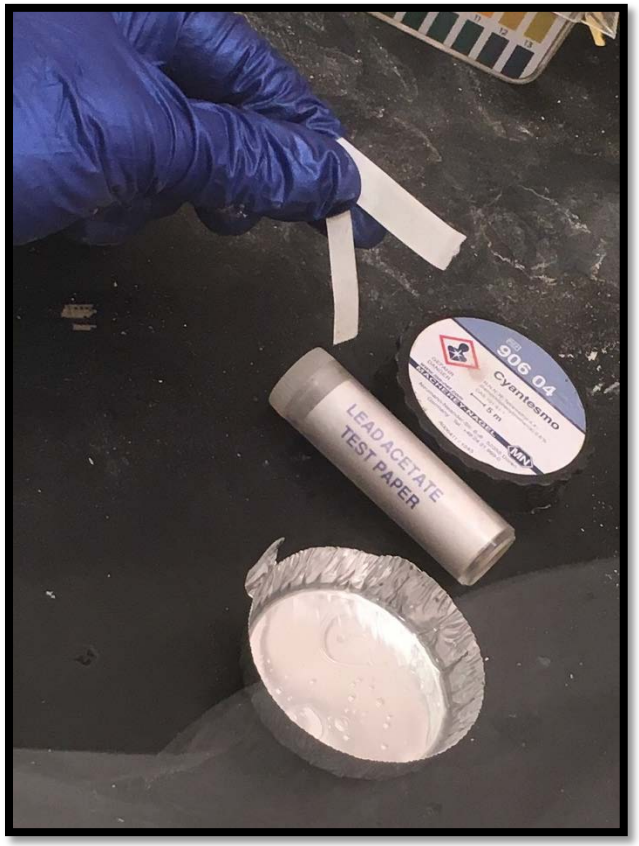
Reactive Sulfides Test

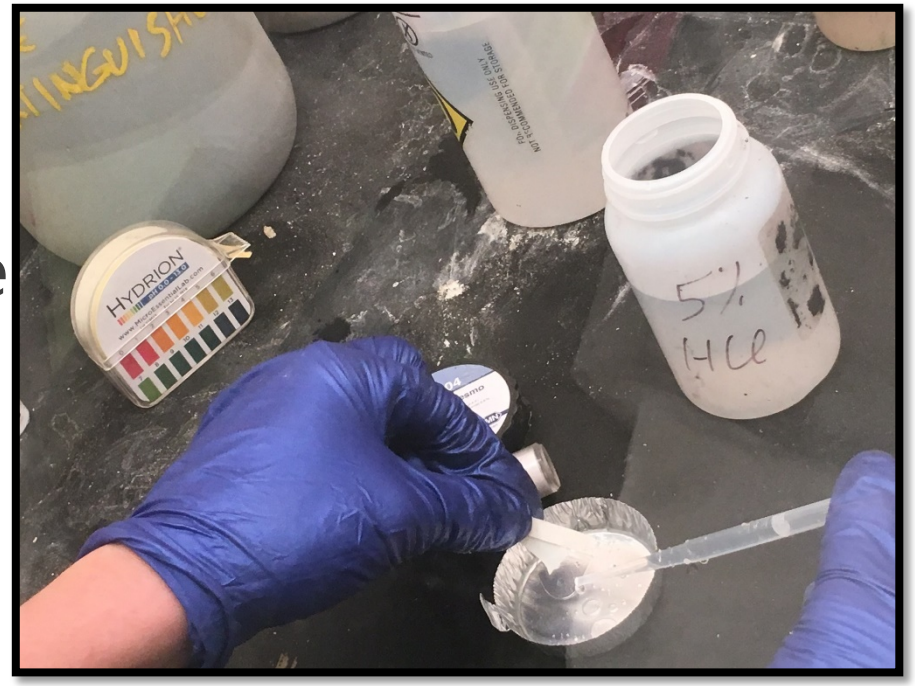


- Remove 10 ml/10g using spatula or pipette
- Place the material into a pan
  - If material solid or semi-solid, slurry
- Wet lead acetate paper with distilled water
- Hold paper above waste
- Add 5% hydrochloric acid, gently stir
- Observe sample and paper for reaction or color change

Observation	Results
Lead acetate strip paper turns brown or black	Possible Reactive Sulfides - D003

Cyanide Test – pH >2 Only

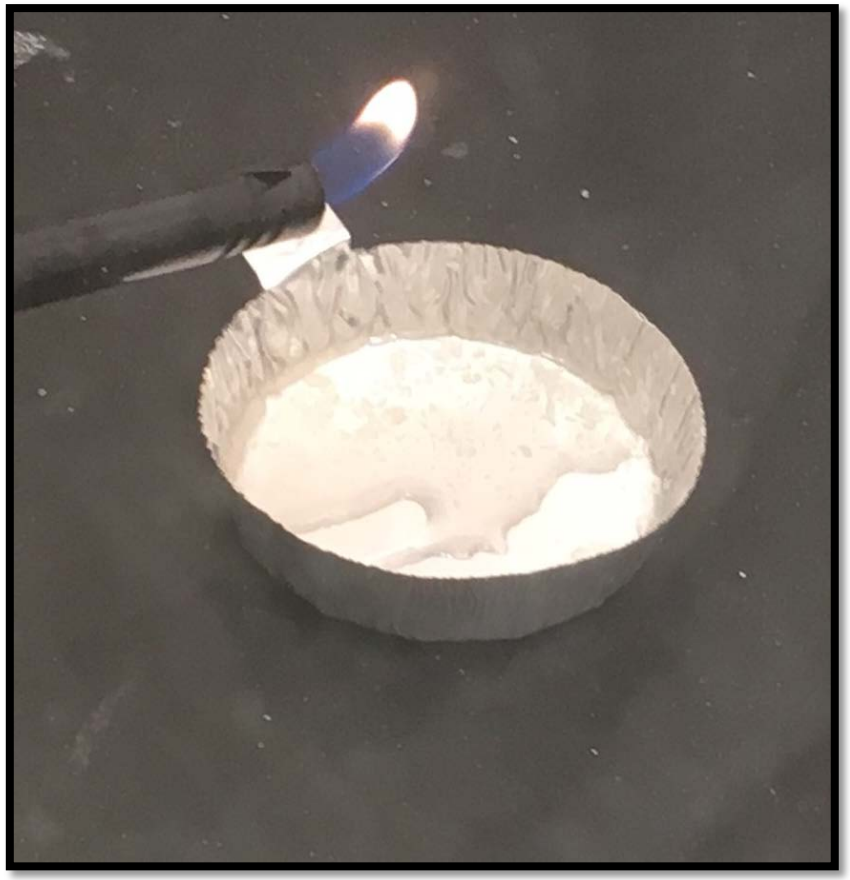
- Remove 10 ml/10g using spatula/pipette
- Place the material into a pan
  - If material solid or semi-solid, slurry
- Wet CYANTESMO paper with distilled wate
- Hold paper above waste
- Add 5 ml of sulfuric acid, gently stir
- Observe sample and paper for reaction or color change



Observation	Results
Pale green test paper turns blue	Cyanide present. RCRA Hazardous for Cyanides (D003)
Test paper shows no change in color	No Cyanide present. Chemical is not RCRA Hazardous

Flammability Test

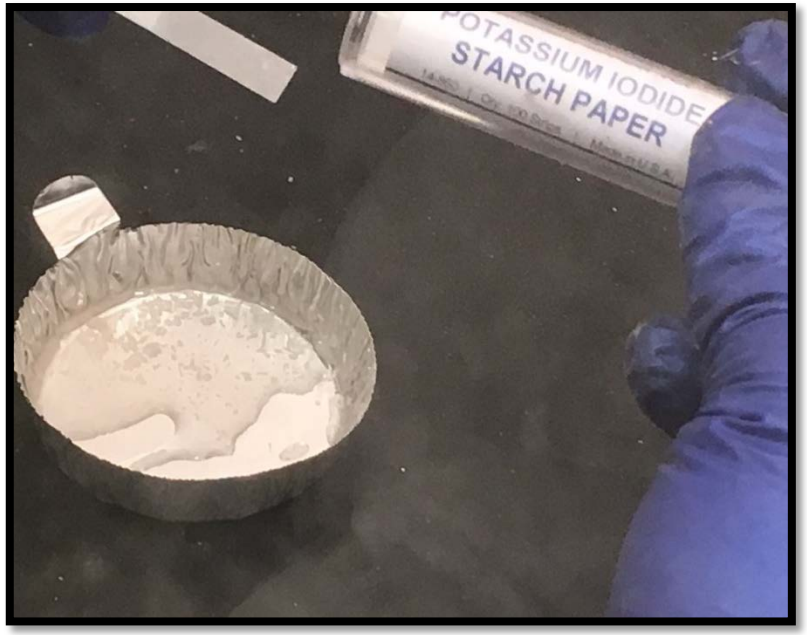
- Remove 5ml/5g using spatula/pipette
- Disposable metal pan
- Apply flame slowly using torch
  - Disposable cover/lid/etc. to extinguish any fire



Observation	Results
Sample is readily combustible	D001
Sample is combustible to a lesser degree, probably organic	DOT combustible for DOT, not RCRA Hazardous
Chemical melts	Non combustible organic or inorganic
Chemical burns and produces green flame	D001 and possibly chlorinated/halogenated

Oxidizer Test

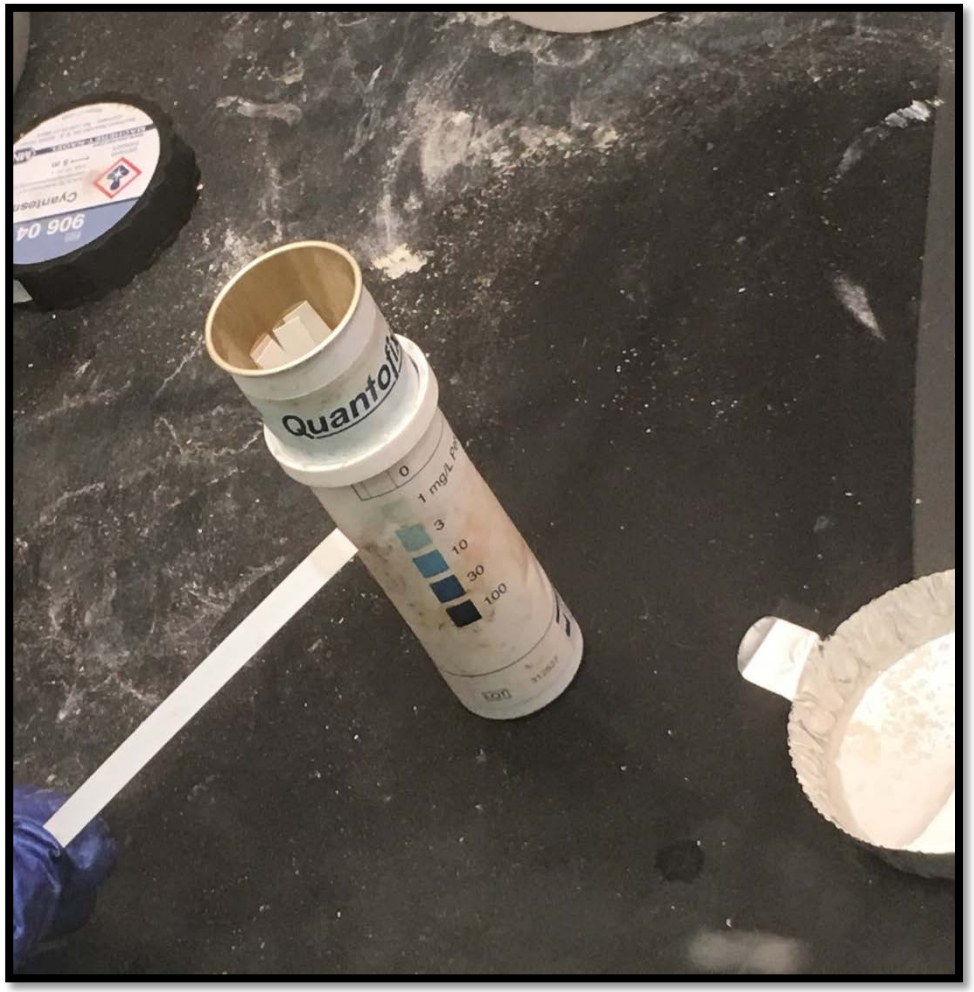
- Remove 5 g/5ml using spatula/pipette
- Place the material in a metal pan
  - If material is a solid or semi-solid, slurry
- Place starch paper in material
- Observe paper for color change



Observation	Results
Potassium iodide test paper turns blue	Chemical is RCRA Hazardous for Ignitability (D001) due to oxidizing characteristics
Potassium iodide test paper shows no color change	Chemical is not an oxidizer

Peroxide Test, If Oxidizer Positive

- Use Peroxide (test paper): Follow the instructions as indicated on the test strips as the instructions differ slightly between test strips and when used for aqueous materials vs. organic solvents



PCB Test

http://www.globalindustrial.com/

- If PCBs are suspected in oils or organic solvents verify that WTI will be performing a PCB test on the material
- If not, the following kits may be used for determining the presence of PCBs

Soil	Clor-N-Soil PCB Screening Kit
Oil	Clor-N-Oil PBC Screening Kit

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Packaging Guidelines

- Unknowns should be packed separately from chemicals that are known
  - Only pack unknowns together per their compatible DOT hazard class
- Unknowns that are water-soluble and non-water reactive should be diluted or moistened with water when possible
  - This should be indicated on the sampling log

PACKAGING GUIDELINES

- Solvent bottles that are “empty” and contain solid residuals **will not** be opened, tested or accepted due to potential peroxide formation

UNKNOWN TESTING FIELD LOG

HERITAGE ENVIRONMENTAL / HERITAGE-WTI UNKNOWN TESTING FIELD LOG

Chemist: **Date:** **Project Name:** **Addl Info:**

Sample ID / Drum / Cont. #	(1) Radio activity	(2) Water Reactivity	(3) pH Test	(4) Sulfides	(5) Cyanides	(6) Flammability	(7) Oxidizer	(8) Peroxide	Applicable Waste Codes
	• +/-	• Mild • Violent • None • Soluble • Insolubl e	• 1-14	• +/-	• +/-	• +/-	• +/-	• +/-	Enter applicable USEPA Hazardous Waste Codes

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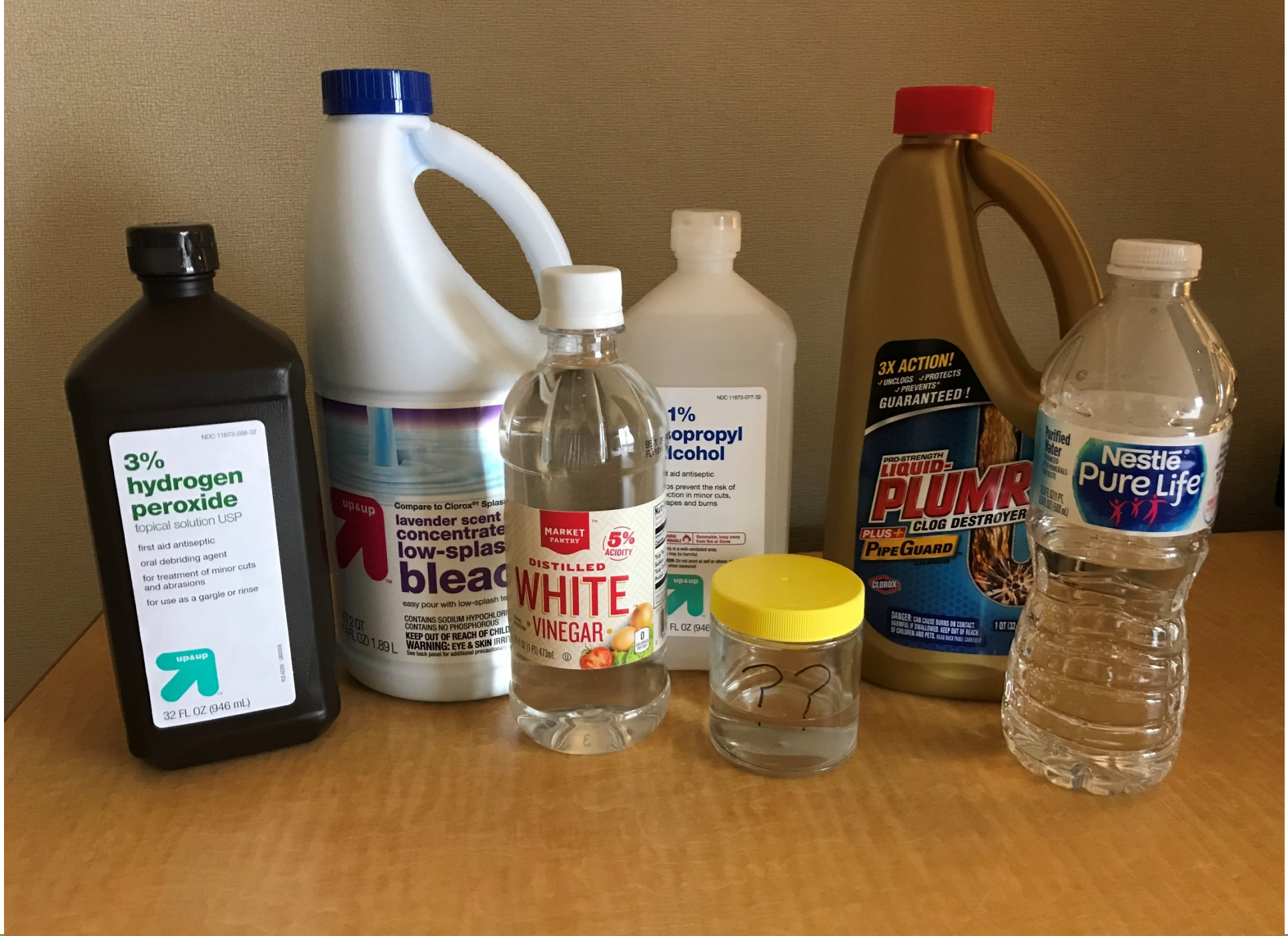
HANDS ON



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Thank You