Sampling for Environmental Enforcement Cases

Gary Steinmetz

Texas Parks & Wildlife

Find a Lab

- Cities/counties
- Wastewater
- River Authorities
- National environmental laboratory accreditation program

Lab Selection

- Find a lab before you are sampling.
- Get their protocols and requirements.
- Make sure they realize they are criminal samples.
- Meet the chemist who will testify about the results.

No Guarantee

- Intertek Testing Service Environmental Lab (ITS). between 1988 and 1997, conspired to falsify the results of environmental tests. The test results were used for decision making at Superfund sites, Department of Defense facilities and hazardous waste sites to determine site safety and to monitor the migration of hazardous waste.

- ITS was sentenced to 42 months probation, ordered to pay $9 million in federal fines and subsequently agreed to pay an $8,741,000 civil penalty.

Three Types of Sampling

- Permitted Discharges
- Planned Sampling Events
- Oh $#*@ I got to get a sample

Permitted Discharges

- Permit samples should be analyzed by method specified in permit.
- The method will require specific sample container, volume, and preservation.
- Request that QC samples be selected from your samples.
- Request a complete QC report.

Sampling Permitted Discharge

- Get a representative sample of the discharge.
- Follow the method required by the permit
- This is the only time you do not need a background sample.

Planned Sampling Events

- Get a representative sample of the contaminant, not the area.
- Take as large a sample as practical.
- Take a background sample.

Sampling

- Get a representative sample of the contaminant, not the area.
- Take as large a sample as practical.
- Be prepared, have a kit in your vehicle with clean laboratory containers, and gloves.
- Take a background sample.

State of Texas v. Fifth Generation, Inc. aka Tito's Distillery

What should be sampled?

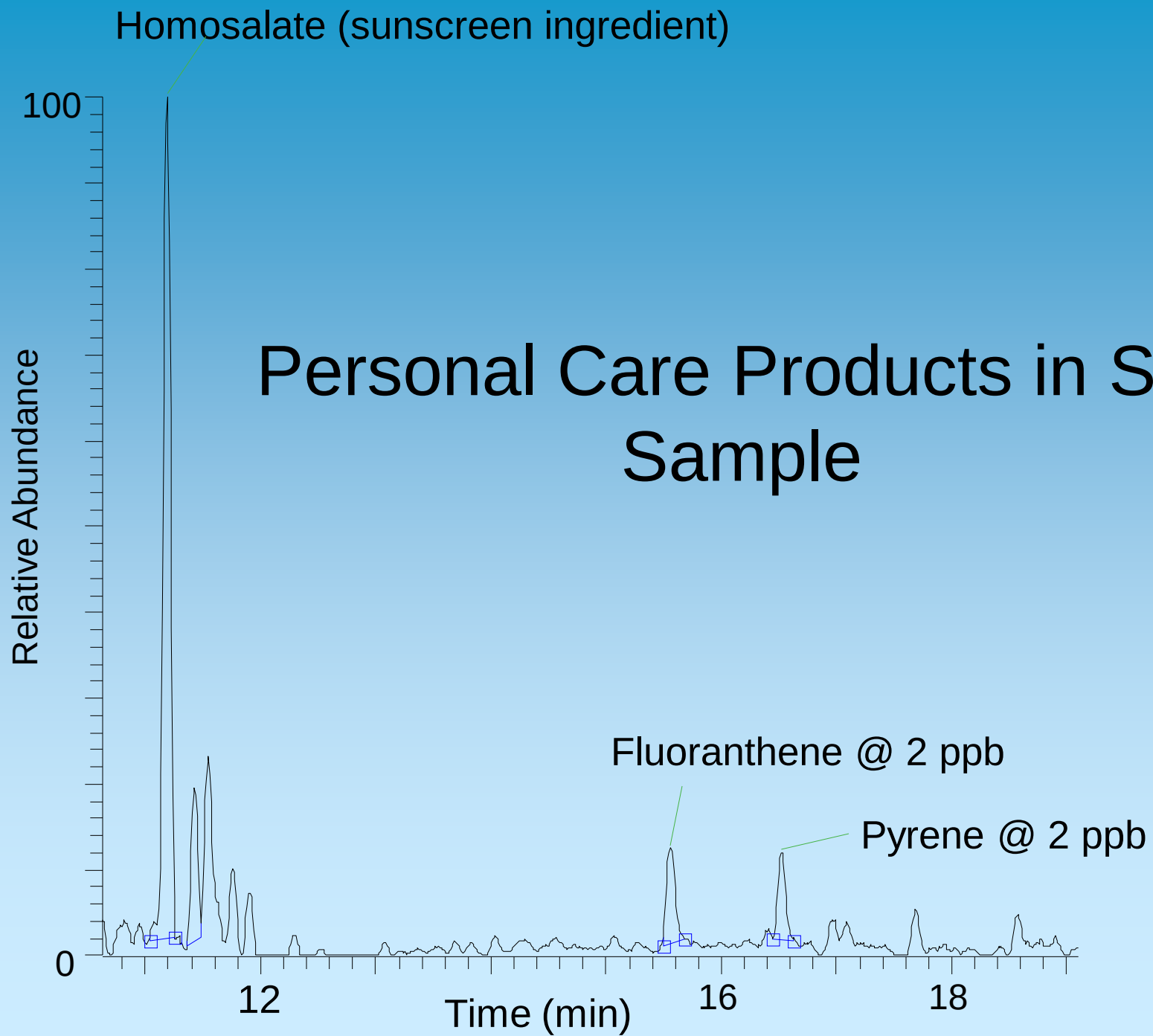
Containers

- Clean laboratory glass containers are preferred.
- Use plastic for conventional analytes and metals.
- Use glass for organics and TPH.

Cross-contamination

- Sample collection
  - Clean sample containers
  - Clean equipment
  - Fresh gloves
- Sample transport
  - Sample containers
  - Proximity to elevated samples

Personal Care Products in Soil Sample



Personal Protection

Common Hazards

- Fire and explosions
- Gases-hydrogen sulfide, carbon monoxide, methane, cyanide
- Poisoning-pesticides, herbicides and rodentacides
- Chemical burns, contact dermatitis
- Infections

Dead Fish or Birds

- Dead animals should get your attention
- Recent wildlife kills due to anthrax
- Recent bird kill due to strychnine

Safety

- If you are not sure that an area is safe, stay away.
- Do not enter confined spaces or low-lying areas.
- Do not lean over open waste containers, or kick, rock or puncture waste containers.
- Do not track toxic material into your car.

Basic Protection

- Distance
- Time
- Shielding
- Decontamination

How Safe Are Gloves?

	Nitrile	Latex
Acetone	3 min	2.4 min
Benzene	4.2 min	36 sec
Methylene Chloride	6 min	2 min
Kerosene	>1260 min	<5 min

After any field work do you…

- Return to your work truck and sit on the seat?
- Wear your boots/ shoes into your home?
- Walk on the carpet where your children play?
- Wash work clothes in the family washer?
- Store your samples in your fridge at home?

Don’t bring your hazardous work home!

Chain of Custody

- Name of the collector and their signature.
- Date and time the samples were collected.
- Sample identification numbers.

- Where the samples were collected.
- How are they preserved.
- What are they to be analyzed for.

COC Example

TEXAS PARKS & WILDLIFE

Chain of Custody and Analysis Request

Environmental Contaminants Laboratory, 505 Staples Road, San Marcos, TX 78666
Tel: 512-353-3486, Fax: 512-353-7329

Sample(s) collection site:	Date:	Time: ☐ a.m. ☐ p.m.
Project name (if applicable):	Case number (if applicable):	
Collector's Name:	Send results to (if different from Collector):	
Agency/Division:	Agency/Division:	
Street Address or P.O. Box:	Street Address or P.O. Box:	
City, State, Zip:	City, State, Zip:	
Telephone:	Telephone:	
E-mail:	E-mail:	

Sample Information

Sample ID#	Sample Description	Lab use only Lab ID	Please indicate type of analysis requested and place in appropriate column(s) Organic	Inorganic	Other

Chain-of-Custody

Collector: (signature)	Date:	Time: a.m. p.m.
Released to: (signature)	Date:	Time: a.m. p.m.
Released to: (signature)	Date:	Time: a.m. p.m.
Released to: (signature)	Date:	Time: a.m. p.m.

Comments:

Holding Times Organics

- **Sample container**

  Aqueous-1000 mL glass bottle

  Solids-50 g glass jar
- **Preservative** Cool, on ice
- **Hold time** 7 days

Holding Times Oil & Grease

- **Sample container**

  Aqueous-1000 mL glass bottle

  Solids-20 g glass jar
- **Preservative** Cool, on ice
- **Hold time** Aqueous 48 hours on ice

  28 days pH<2 H_2SO_4

  Solids 14 days on ice

Holding Times Inorganics

- **Sample container**

  Aqueous 250 mL plastic bottle

  Solids 20 g glass jar or zip-lock
- **Preservative** None
- **Hold time** 28 days

Holding Times Solids

- **Sample container**

  Aqueous 250 mL plastic
- **Preservative** Cool, on ice
- **Hold time** 7 days

Missed Holding Times

- Contamination during storage.

  Example—a cooler being stored in garage with a lawn mower or car which would be potential source of gasoline constituents.
- Sample degradation. Loss of analyte.

  Exceeding the holding time is not acceptable in establishing that a waste does not exceed the regulatory level. Exceeding the holding time will not invalidate characterization if the waste exceeds the regulatory level (EPA method 1311).

Sample Delivery to Lab

- The samples must be accompanied by the chain-of-custody record.
- If possible deliver in person to the laboratory.
- Samples can be shipped by common carrier to the laboratory.

Shipping Requires

- Must be packaged in a proper shipping container to avoid leakage and/or breakage and maintain proper temperature. Use custody seal.
- All packages must be accompanied by the chain-of-custody record.
- When sent by common carrier, obtain a copy of the bill of lading. Receipts and bill of lading copies are used as part of the chain-of-custody documentation.

What's in This?

The Tricorder

- This is what everyone expects us to have
- Do some homework
- Know the type of chemicals
- Know the type of industry

Analysis Request

- Type of Industry will guide you on analysis.
- Here is where relationship with Chemist Helps.
- Request that QC samples be selected from your samples.
- Request a complete QC report.
- Request that samples be held for further analysis.

PAH sources

- Used motor oil
- Burned hydrocarbons, wood, plastics and trash
- Parking lot and road sealants
- Burned tires
- Coal-tar

Results

- Check the obvious
  - Do the sample ids match the COC?
  - Were the requested analysis done?
  - Concentration units given?
  - Is there a QC section?

    (Blanks, duplicates and matrix spikes)
  - Date of analysis and analyst listed?

Quality Control

- Do the numbers follow a logical pattern?
- Check the blank and background sample.
- Check the spiked sample for % recovery.
- Check the duplicates for repeatability.

More than 20 % variation should be explained acceptance limits should be on report.

Oh $#*@ I got to get a sample

- Get a representative sample of the contaminant, not the area.
- Take as large a sample as practical.
- Take a background sample.

Alternate sample jars?

Alternative Containers

- Clean laboratory glass containers are preferred. Make sure lab will accept alternatives.
- In an emergency mason jars, zip-lock bags, water bottles can be used.
- Use plastic for conventional analytes and metals.
- Use glass for organics and TPH.

•Use glass to collect for organics (TPH, pesticides, Semi-volatiles, Volatiles).

Organics will stick to plastic and never come off.
Recovery will be poor.

Hints

- Try to use 1 type of container.
- Include an empty container as a blank.
  (If using water bottles include full bottle).
- Include a background sample.

What Killed The Fish?

It Takes a Veterinarian

The Texas Veterinary Medical Diagnostic Laboratories (TVMDL)
Phone: 979-845-3414 or 1-888-646-5623

Hazardous Waste Determination

TCLP
TOXICITY CHARACTERISTIC LEACHING PROCEDURE

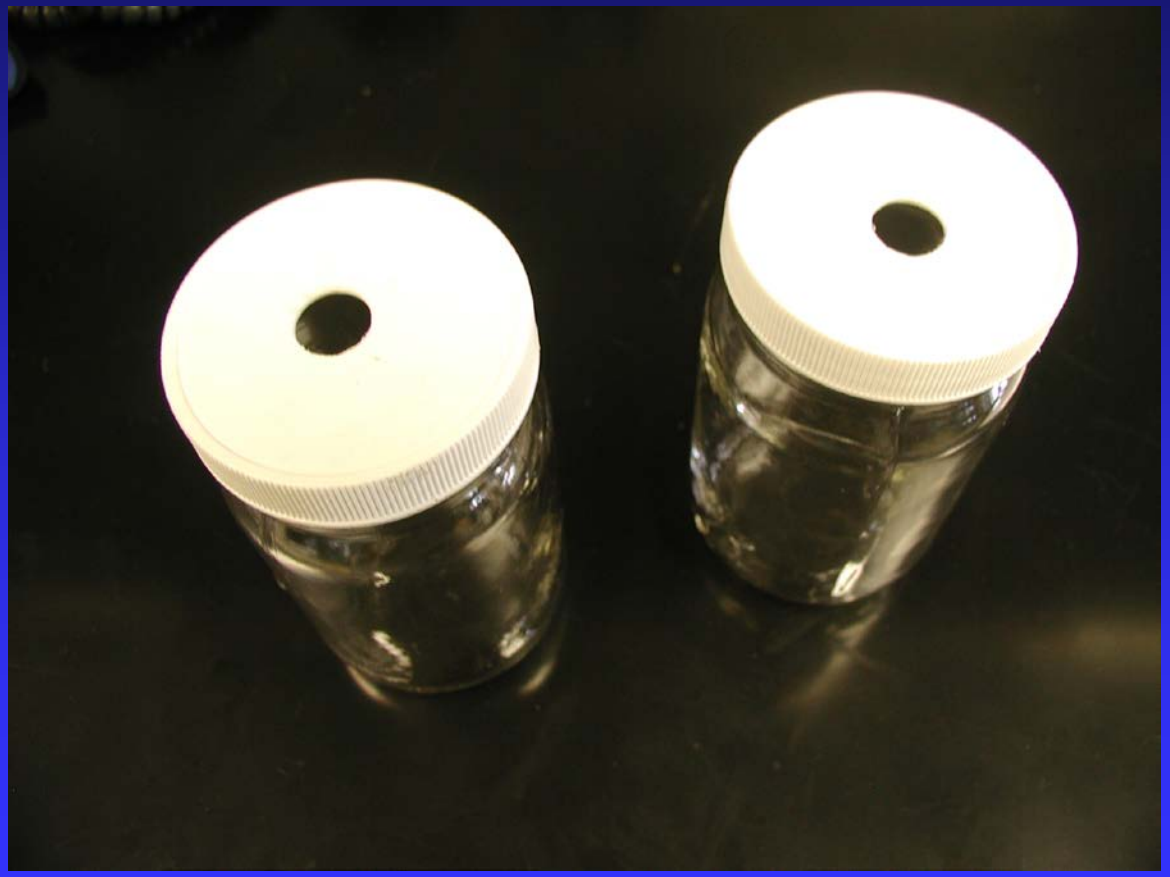
- Designed to evaluate how much contamination will leach out from a pile of waste if it gets rained on by acid rain
- Uses a dilute acid solution to leach samples.
- Contaminants are slightly soluble- rarely enough to be a violation.
- Other analysis recommended…

Visuals Help

Bad Examples

Proper Labeling

Sealed Containers



Unique Identification

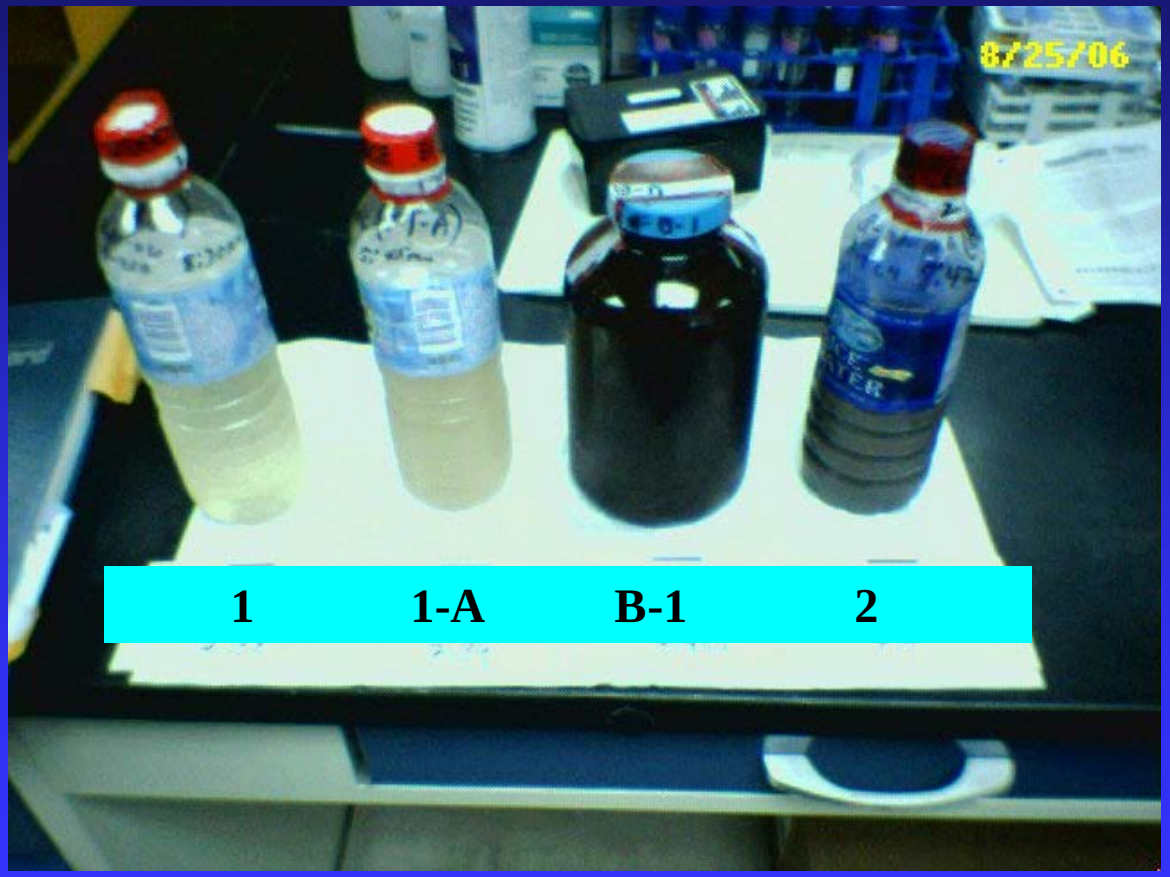
Labels Match Chain of Custody

Label Containers

Secure Labels

Appropriate Container

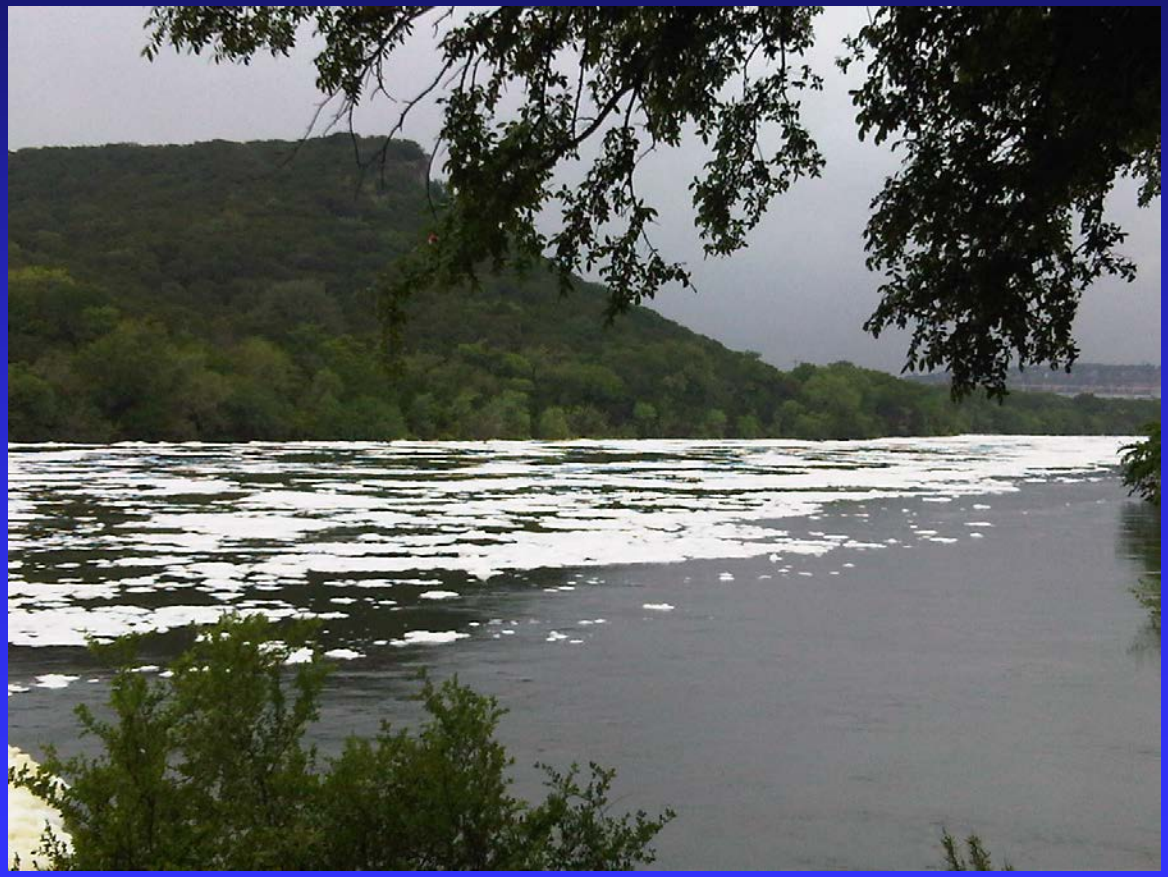
Suggestions?



Case Examples

Down the Drain

Foam on the River




BRAZOS
RIVER

Hoarder


2055


ACETONE
FLAMMABLE LIQUID,
RQ (5,000 LBS.), 3, UN 1090, II
FLAMMABLE LIQUID AND VAPOR. HIGH VAPOR CONCENTRATIONS CAN CAUSE
DROWSINESS AND IRRITATION.
READ MATERIAL SAFETY DATA SHEET BEFORE USING
IN CASE OF EMERGENCY CALL CHEMTREC AT 1 800 424 9300
NET WEIGHT 360 LBS.
Phone (713)468 5768
FLAMMABLE LIQUID

River Runs Red


Trinity River
Cedar Creek
Columbia Packing
Company
Google earth

What should you do?


thorium
90
Th
232.04
nitrogen
7
N
14.007
potassium
19
K
39.098
yttrium
39
Y
88.906
oxygen
8
O
15.999
uranium
92
U
238.03