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Regulation Through Revelation:
Using Information Disclosure to Regulate Emerging Technologies

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Why does disclosure matter?

- Regulatory controls face fundamental limits:
  - Slow to respond to new events and technology
  - “Regulatory ossification”
  - Problems of scale (national solutions for local problems)
  - Democratic expectations for technocratic challenges

- Market approaches avoid some, but not all, problems
  - Externalities
  - Information imbalance
  - Transaction costs
  - Enforcement and protection against abuse

Disclosure as an Alternative Approach

- Model: compel production of vital or material information, and make it easily accessible in a consistent format
  - Securities disclosure
  - Truth in labeling

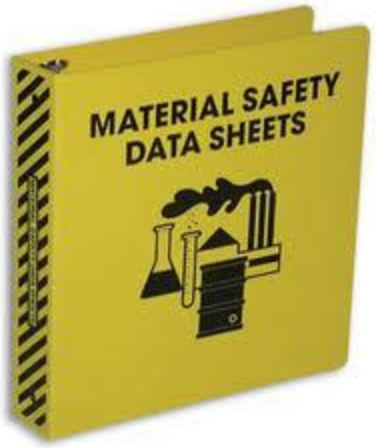
- Advantages – flexibility, speed, adaptability, power to decide

- Disadvantages –
  - Enforcement
  - Integration with other legal controls
  - Actually affect behavior for certain risks?
  - “Teach to the Test” syndrome

Examples of Disclosure Laws

- Emergency Preparedness and Community Right-to-Know Act
  - Toxic Release Inventory
  - Material Safety Data Sheets
  - Tier 2 inventory reports

Worker Safety Disclosure



ScienceLab.com
Chemicals & Laboratory Equipment

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Acetone MSDS

Section 1: Chemical Product and Company Identification

Product Name: Acetone

Catalog Codes: SLA3502, SLA1645, SLA3151, SLA3808

CAS#: 67-64-1

RTECS: AL3150000

TSCA: TSCA 8(b) inventory: Acetone

CI#: Not applicable.

Synonym: 2-propanone; Dimethyl Ketone; Dimethylformaldehyde; Pyroacetic Acid

Chemical Name: Acetone

Chemical Formula: C3-H6-O

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Acetone	67-64-1	100

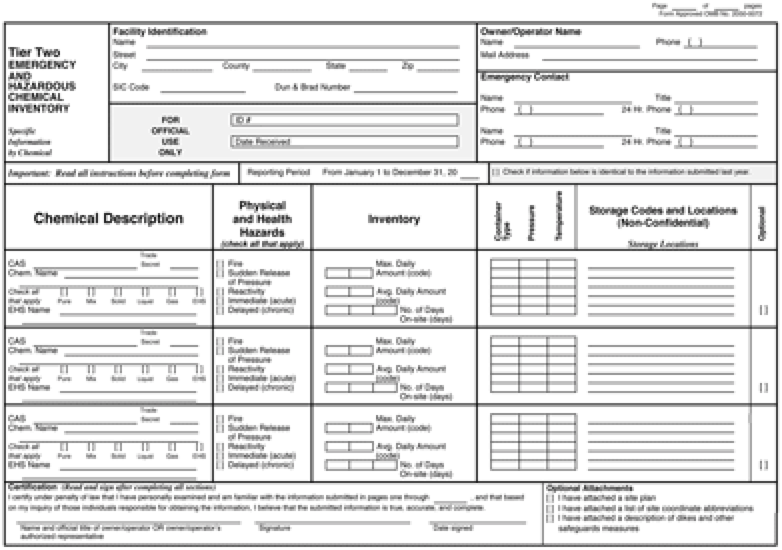
Toxicological Data on Ingredients: Acetone: ORAL (LD50): Acute: 5800 mg/kg [Rat]. 3000 mg/kg [Mouse]. 5340 mg/kg [Rabbit]. VAPOR (LC50): Acute: 50100 mg/m 8 hours [Rat]. 44000 mg/m 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED].
The substance is toxic to central nervous system (CNS).
The substance may be toxic to kidneys, the reproductive system, liver, skin.
Repeated or prolonged exposure to the substance can produce target organs damage.

Tier 2 Inventory Reports


Tier Two
EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY
Specific Information by Chemical

Facility Identification
Name
Street
City County State Zip
SIC Code Dun & Brad Number

FOR OFFICIAL USE ONLY
ID #
Date Received

Owner/Operator Name
Name Phone
Mail Address

Emergency Contact
Name Title
Phone 24 Hr. Phone
Name Title
Phone 24 Hr. Phone

Important: Read all instructions before completing form
Reporting Period From January 1 to December 31, 20
Check if information below is identical to the information submitted last year.

Chemical Description	Physical and Health Hazards (check all that apply)	Inventory	Container Type	Pressure	Temperature	Storage Codes and Locations (Non-Confidential) Storage Locations	Optional
CAS / Trade Secret / Chem. Name / Check all that apply: Pure, Mix, Solid, Liquid, Gas, EHS / EHS Name	Fire / Sudden Release of Pressure / Reactivity / Immediate (acute) / Delayed (chronic)	Max. Daily Amount (code) / Avg. Daily Amount (code) / No. of Days On-site (days)					[ ]
CAS / Trade Secret / Chem. Name / Check all that apply: Pure, Mix, Solid, Liquid, Gas, EHS / EHS Name	Fire / Sudden Release of Pressure / Reactivity / Immediate (acute) / Delayed (chronic)	Max. Daily Amount (code) / Avg. Daily Amount (code) / No. of Days On-site (days)					[ ]
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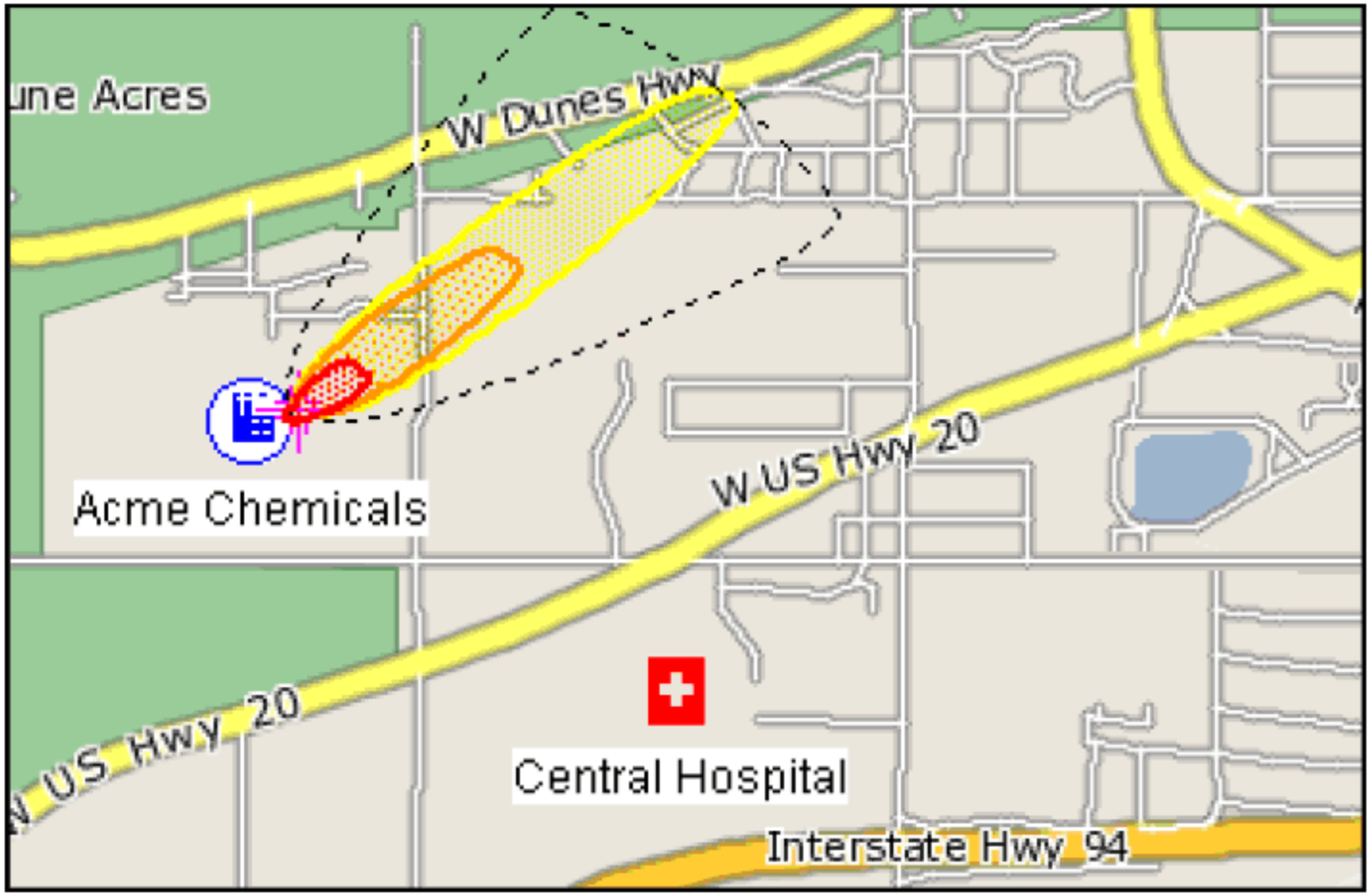
Certification (Read and sign after completing all sections)
Name and official title of owner/operator OR owner/operator's authorized representative Signature Date signed

Optional Attachments
I have attached a site plan
I have attached a list of site coordinate abbreviations
I have attached a description of dikes and other safeguards measures

- Requires disclosure of location, storage and systems for handling hazardous substances and chemicals
- Practical questions:
    - Who's covered?
    - What's covered?
    - What's secret?
    - Who can look?

Related law – Clean Air Act's Risk Management Program rules



Examples of Disclosure Laws

- California Proposition 65
  - List of chemicals
  - Warning to consumers
  - Drinking water discharge prohibition
  - Citizen suit provisions
  - Safe Harbor numbers
- Differences in approach from EPCRA

Disclosure laws – self-reporting requirements

- Clean Water Act – NPDES discharge reports
- Comprehensive Environmental Response, Compensation and Liability Act – section 103 release reporting
  - Requires report, and imposes penalties for failure to accurately disclose
  - Immunizes persons who do disclose
- Real estate transaction disclosure requirements for toxic contamination (New Jersey ISRA)

Disclosure – labeling

- Empower consumer by requiring accurate disclosure of full set of standardized information

- Examples:
  - Nutritional labels
  - Calorie disclosure
  - Organic food labeling
  - FTC “Green Label” Guidance

- Limits:
  - First Amendment
  - Liability risks (food libel laws)

Results?

- Toxic Release Inventory
  - Extremely effective in highlighting amounts and locations of releases
  - Identified and expanded knowledge of new issues (environmental justice, hot spots, revenues)
  - Powerful lever to encourage change in behavior (33/50 program, 90% reductions)
  - Investment decisions (CERES principles)

- Proposition 65
  - Gap filling function (lead faucets, flea collars)
  - Speedy compilation of chemicals lists and toxicological info
  - Concerns: diminishing returns on warnings, litigation industry

Results?

- EPCRA
  - Effective in forcing collection of information and site data
  - MSDS disclosures
  - Tier 2 (and off-site consequence analysis): balance between transparency and security

- CERCLA release reporting
  - Comprehensive database spill histories, and useful emergency response information
  - Inconsistent application by facilities
  - Gaps and overlaps (petroluem)

- National Environmental Policy Act

Lessons learned

- Who's the focus of the information? (facility vs. consumer)
- Gaming the system (injection wells)
- Do people respond appropriately to risk disclosure?
  - Cognitive bias for low-probability, high-risk events
  - **Perception** as important as **disclosure** (reaction to involuntary risk)
  - If disclosure is driven by regulation, subject to same problems as direct command-and-control regulation

Application to Emerging Technologies?

- Law requiring labeling for consumer products containing nanomaterials?
- Disclosure requirements when risk is unknown? (Prop. 65 and nanomaterials; environmental impact statement for geoengineering project)
- What happens when new technology poses a different kind of risk? (PBT compounds)

Questions?

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