

Environmental Health and Safety: Hazardous Waste Management and Safety Standards on Campus

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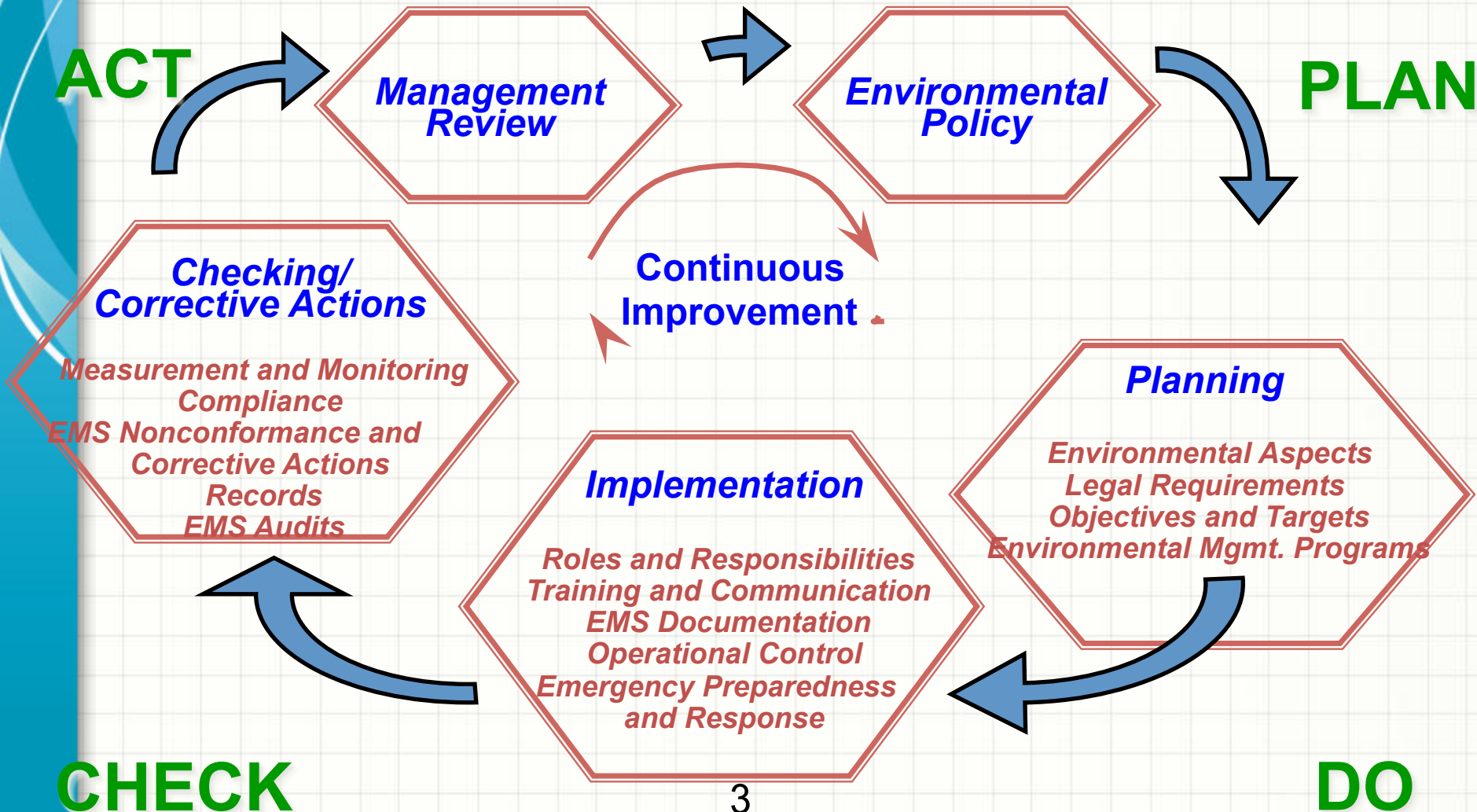
**Graduate School of Life and
Environmental Sciences**

Environmental Management System (EMS)

- ◆ An EMS is a set of procedures that helps an organization reduce its environmental impacts.
- ◆ An EMS integrates environmental considerations into the business operations
- ◆ An EMS helps organizations set priorities for action as well as future monitoring programs to ensure compliance with environmental regulations

EMS Framework

The International Standard ISO 14001 is the most widely used and respected.



Hazardous Waste Management (HWM)

Hazardous Waste Outline

Substance or Material that could potentially threaten human health or the environment

Meet any or more physical characteristics:



HWM: Life Cycle Thinking

Identification

Collection

Storage

Transportation

Disposal

What is Hazardous Waste?

- A substance or material that could potentially threaten human health or the environment
- Waste materials which meet any one or more of four physical characteristics are regulated as hazardous.
- Wastes listed by government bodies responsible

Responsibility

- ▶ Primary Responsibility for hazardous waste determination rests with the generator
- ▶ Generator is responsible for proper handling and disposal

What is Hazardous Waste?

Difference between laboratory and industrial hazardous waste?

- ▶ Points of Generation
- ▶ Volume
- ▶ Waste Streams

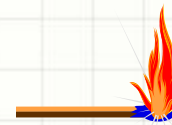
Steps on HWM: Life Cycle Thinking

- Identification
- Collection
- Storage
- Transportation
- Disposal

Hazardous Waste Identification

Characteristics

Ignitability: A liquid with a flash point less than 60 C (140 F) is considered an ignitable hazardous waste (organic solvents such as acetone, xylene, isopropanol, and acetonitrile).



Corrosivity: A waste aqueous solution having a pH of less than or equal to 2, or greater than or equal to 12.5 (hydrochloric acid, glacial acetic acid, nitric acid)



Hazardous Waste Identification

Characteristics

Reactivity: Any chemical waste which reacts violently with air and/or water or liberate toxic gases (sodium, potassium, peroxides, Cyanides or Sulfides containing materials).



Toxicity: Any material that can be harmful or fatal if you are exposed and can pollute groundwater if released on land (lead-based paints, cadmium, arsenic, mercuric chloride, wastes containing > 0.5 ppm benzene)



Collection

- Labeling: Use the University Labels
 - Include “Hazardous Waste”
 - Type of waste materials in words
 - The associated hazards (toxic, corrosive, etc)
 - Dates when accumulation starts and when it becomes ready for disposal
- Closures: Keep containers closed at all times except when adding or removing contents.
- Secondary Containment: minimize spillage, breakage, etc
- Condition: Contents of leaking containers must be transferred into another container



Storage

Some chemicals degrade to produce hazardous by products (ether)

Exposure to air and water (sodium metal)

Containers must be compatible with the wastes stored

Store only one container per waste stream

Place the container near the point of generation

Fume hoods are not storage areas



Labeling Examples

REFER TO LABELING
INSTRUCTIONS
ON REVERSE SIDE



08062

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

CONTENTS

USE FULL CHEMICAL NAME
NO FORMULAS OR ABBREVIATIONS

1. ETOH %
2. 0 %
3. %
4. %

HAZARDS

(SEE REVERSE SIDE)

- ☐ IGNITABLE/FLAMMABLE ☐ OXIDIZER
☐ CORROSIVE ☐ TOXIC/POISON
☐ OTHER (SPECIFY) _____

MARK DATE WHEN FULL OR READY FOR PICK UP

DATE _____ / _____ / _____

Building _____ Room No. _____

PI/Manager _____

Phone _____

Hazardous Waste is

- 90% Ethanol
- 10% Water

Formulas have been used
instead of chemical names.
In addition approximate %
should be included

Hazard box has not been
checked. Use the [HW
characteristic reference
tool](#) for assistance.

REFER TO LABELING
INSTRUCTIONS
ON REVERSE SIDE



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HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

CONTENTS

USE FULL CHEMICAL NAME
NO FORMULAS OR ABBREVIATIONS

1. Ethanol % 90
2. Water % 10
3. %
4. %

HAZARDS

(SEE REVERSE SIDE)

- ☒ IGNITABLE/FLAMMABLE ☐ OXIDIZER
☐ CORROSIVE ☐ TOXIC/POISON
☐ OTHER (SPECIFY) _____

MARK DATE WHEN FULL OR READY FOR PICK UP

DATE 01 / 13 / 2004

Building _____ Room No. _____

PI/Manager _____

Phone _____

Procedure for Waste Disposal

- 2** The Office of Environmental and Safety Management will send you some of the tags shown below, according to the contents.



- 3** You, the applicant, must carry the waste to the treatment facilities in the prescribed style of packaging on the designated date and time.

When carrying it, make sure that you are accompanied by the person responsible for the experiment (the waste generator), who is familiar with the contents.



Notes on storing waste

Store waste in a location that is protected from sunlight and rain and which is not easily accessible to outsiders.

(Do not place the waste in the corridor.)
Be careful not to cause odor leaks or accidents.



When transporting waste, take special care so that no liquid or odor leaks occur.

- 4** The Office of Environmental and Safety Management will perform a simple check and then accept the waste.

Waste Accumulation Areas

Satellite accumulation areas (SAA)

- storage area near the point of generation and under the control of the operator of the process generating the waste.

Central Accumulation Areas

- When the waste is removed from a SAA, it is transferred to the “Central Accumulation Area”

Guidelines for Waste Treatment on Campus



Wastewater to
be drained to
a day-to-day sink

- Day-to-day sinks are provided in offices, hot-water service rooms, lavatories, and so on.
- Wastewater is discharged directly into the public sewage system.
- Day-to-day wastewater such as tea-making water, and non-toxic laboratory wastewater such as buffer solutions, must be drained to these sinks.
- Floc-like suspended organic substances, animal tissue and feces, sterilized growth media, and so on must be drained to a WC with a large waste pipe.

生活流し

生活系排水のみ

Daily-life waste

公共下水道へ直接排出されます
実験廃液はポリタンクへ



Wastewater to
be drained to
a laboratory sink

- Dilute laboratory wash wastewater (tertiary and subsequent wash water for laboratory instruments) must be drained to these sinks.
- Floc-like suspended organic substances, animal tissue and feces, growth media, and so on must not be drained to these sinks.
- Day-to-day wastewater such as tea-making water must not be drained to these sinks, either.



The carelessness of only one individual will instantly prevent us from meeting our targets.

■ Effluent standard for sewage system

Cyanide, organic phosphorus, alkyl mercury:	Must not be detected.
Total mercury:	No more than 0.0005 mg/l
Carbon tetrachloride:	No more than 0.002 mg/l
Arsenic, benzene:	No more than 0.01 mg/l
Dichloromethane:	No more than 0.02 mg/l
Lead, chromium:	No more than 0.05 mg/l

About 1000 kiloliters of general laboratory wastewater is discharged daily by the laboratories of the University.

So, for example, if a mere 20 grams of dichloromethane were to be rinsed down a sink, our target value would be exceeded.

実験流し

3回目以降の洗浄水のみ

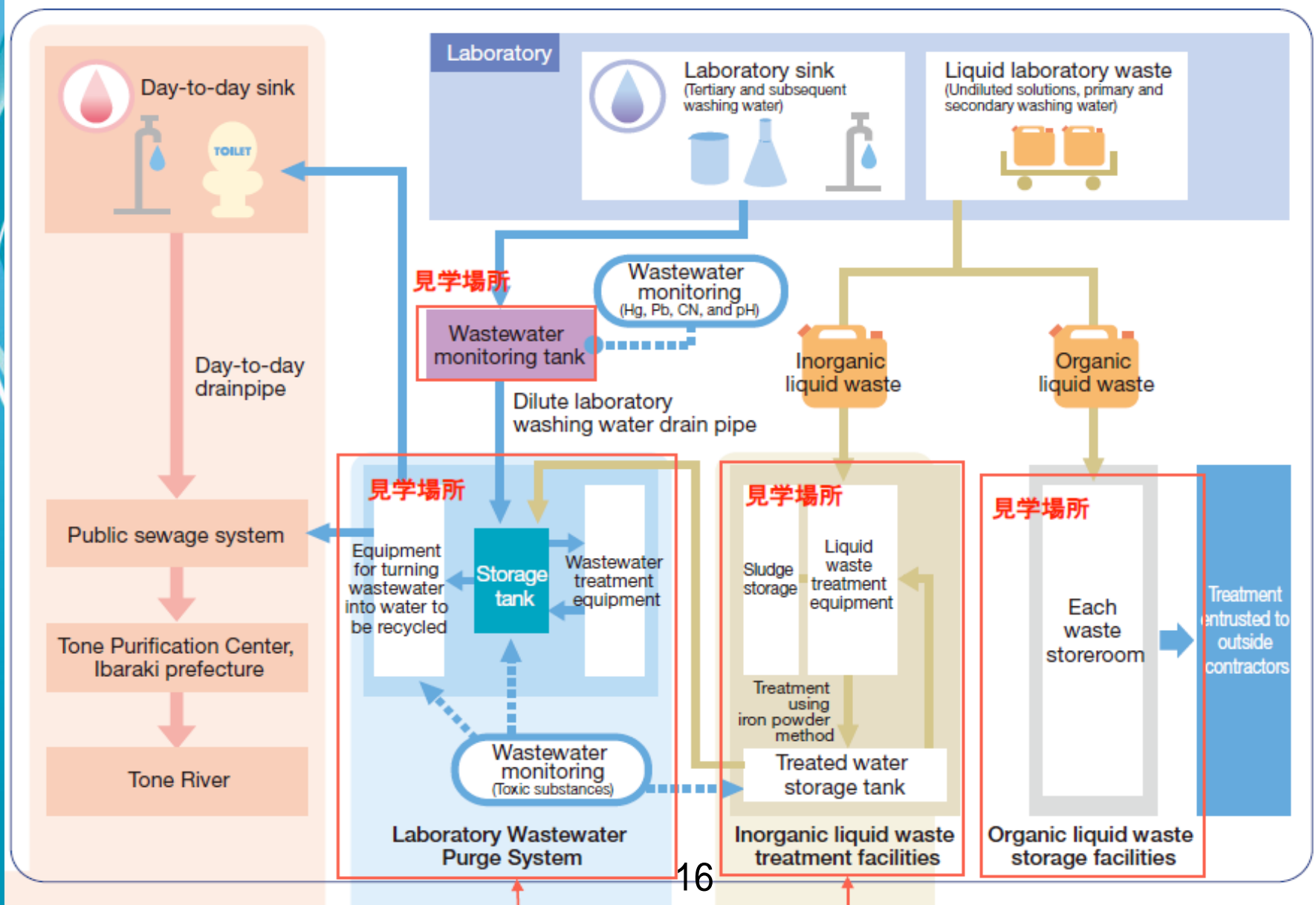
Only dilute washing water permitted

実験廃液はポリタンクへ

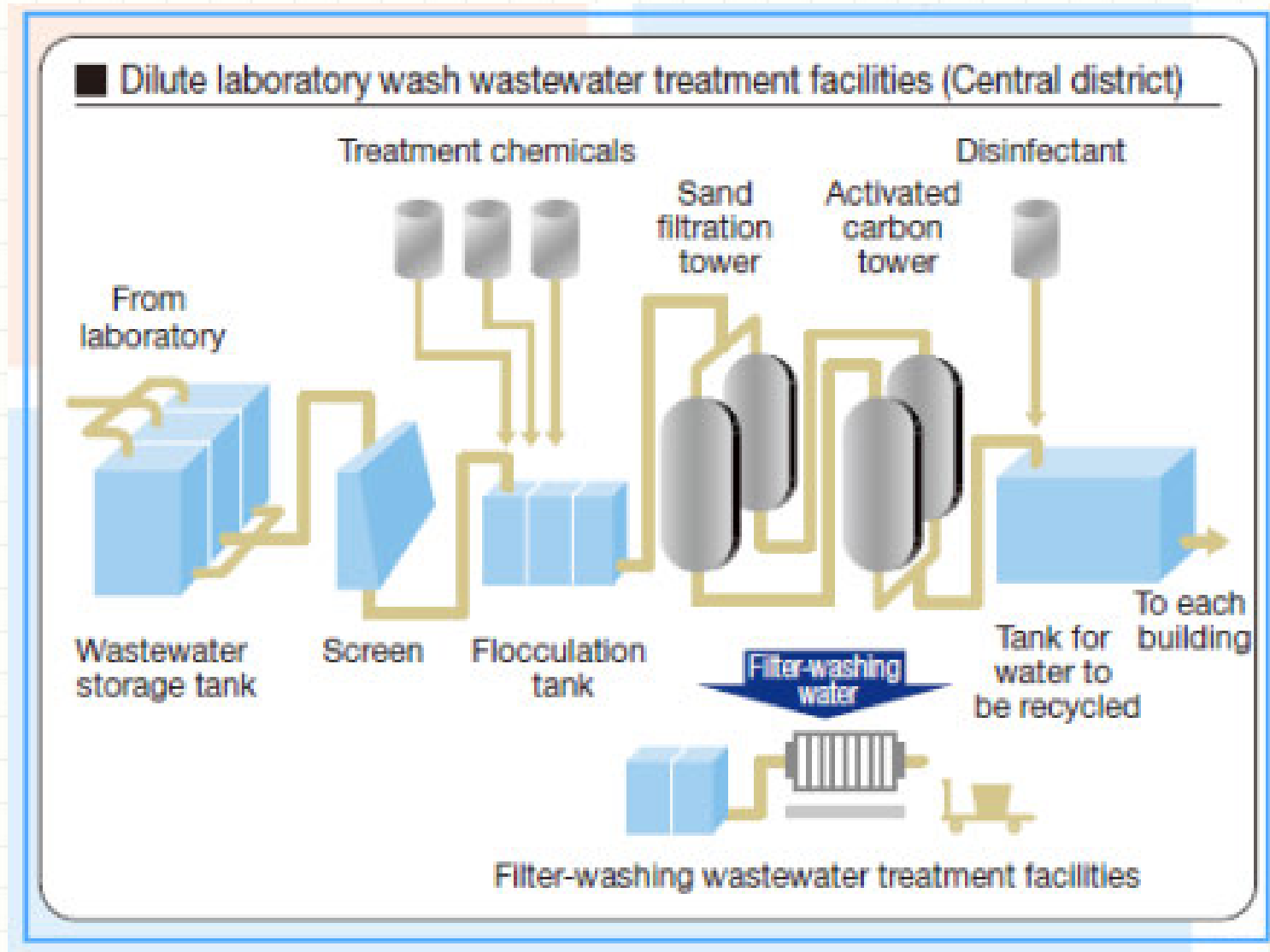
有害物質を流した時は水を止めて
実験環境管理室 (TEL 2891) へ連絡を!

If you accidentally pour mercury, cyanide compounds, or other toxic substances down a sink, turn off the water immediately and contact the Office of Environmental and Safety Management at 2891.

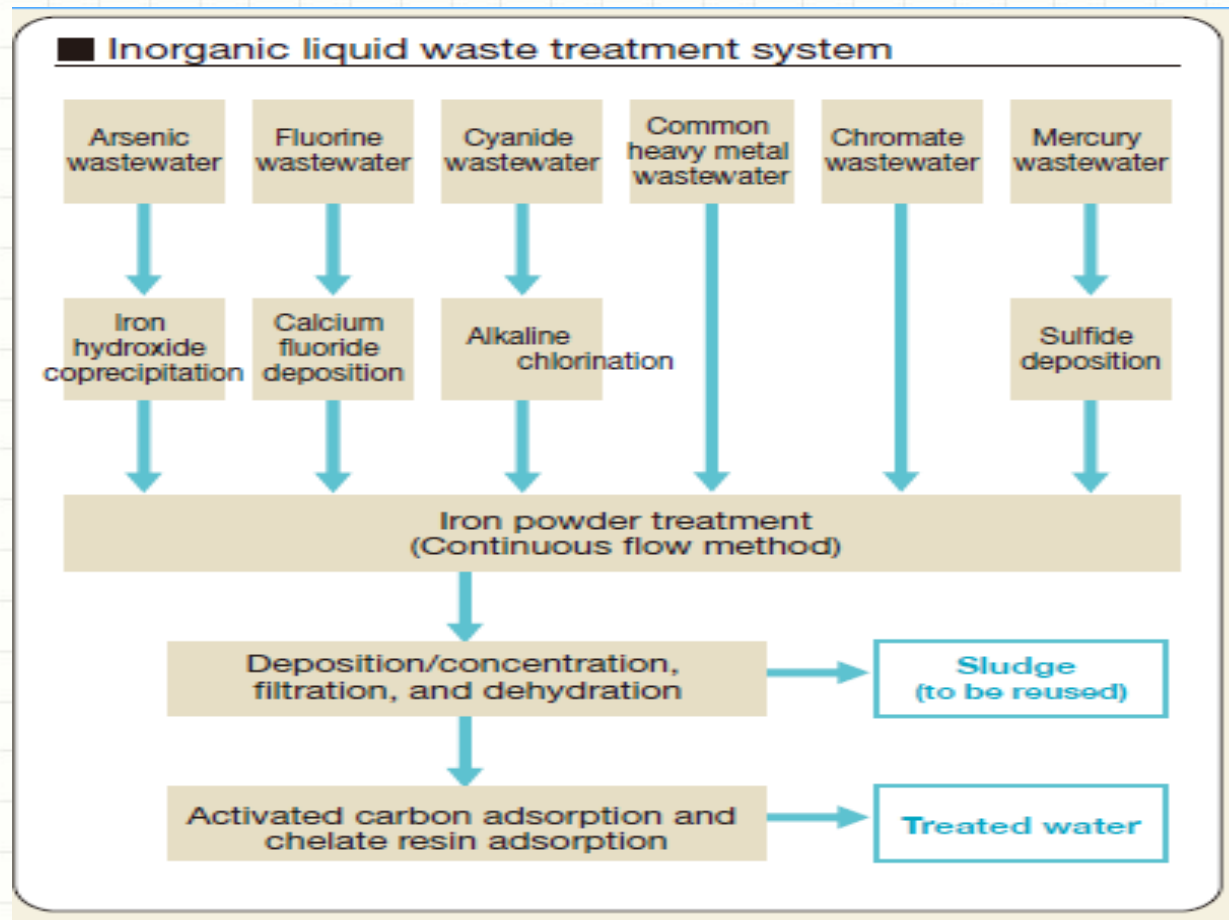
Guidelines for Waste Treatment on Campus



Guidelines for Waste Treatment on Campus



Guidelines for Waste Treatment on Campus



Hazardous Waste Minimization

- Reduce:
 - Chemical substitution
 - Micro and small scale chemistry
 - Procurement changes
 - Chemical Inventory (Tracking)
 - Mercury reduction
- Recycle:
 - Universities provide a list of materials for recycling

Practices/Guidelines

- Hazardous Waste Identification: if unsure consult with supervisor/university officials
- Follow the standards of the University
- Ensure Transfer of Satellite Accumulation Containers
- Never Dispose any chemicals in sinks/drains
- Don't mix hazardous waste with non-hazardous waste
- Check incompatibilities of different types of wastes
- Take safety precautions

Safety Guidelines

Introduction

- The University of Tsukuba places the highest priority on providing a safe and secure environment for the campus-community;
 - However we must always remember that safety is a shared responsibility.
 - It starts with each one of us on campus and expands to encompass the entire community.
- Objectives of today's Safety Guidelines:
 - To protect the life and wellbeing of individuals
 - To raise awareness of safety and health

It is important for each individual to have a firm sense of safety and security.

Safety and Health Guidelines

Univ. of Tsukuba

Safety and Health Manual <http://anzenmon.jp/category/tsukuba-en>



安全衛生マニュアルトップへ

このカテゴリ(英語版(S...))から 検
[索のヒント](#) [日付指定検索](#)



ゲストさん [ログイン](#)

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Safety Management

Preface

1. Safety management system
2. Safety patrol and voluntary inspections
3. Safety education

General Safety Practices

1. General safety practices
2. Person in charge of ignition (origin of a fire)
3. Emergency responses (Fires, explosions, etc)
4. Response to earthquakes
5. Accident reports
6. Waste management

Laboratory Safety Practices

1. General items
2. Safe handling of hazardous material
 - Miscellaneous hazardous substances
 - Poison and deleterious substances

Emergency Call

Emergency Contacts

Incident Cases

Consultation Desk

AED Locations

Safety Patrol

Environmental & Safety Management



[Total Health Promotion Plan \(THP\) at Workplace \(Managing mental health, etc.\)](#)

[Latest News](#)

[Video for Safety and Health Education](#)

Accident Prevention

1. Most importantly, prevent accidents by:

- Individual safety awareness and motivation
- Acquisition of necessary skills and knowledge
- Preparation of manuals



2. In preparation for accidents:

- Keep emergency contact information
- Protectors/safety guards will minimize damage



In case of Earthquakes

- Chemicals

If bottles containing chemicals fall to the floor, they may break and the contents may spill, which is dangerous for **fires and/or poisoning**.

Secure chemical shelves to prevent bottles from falling.

