Laboratory Operational Procedure	Effective Date: February 6, 2016
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Procedure No.: 100-100	Revision No. 1

Water Center Laboratory Operational Procedure

The Water Center Laboratory provides research support for many departments at Tennessee Technological University, performs analytical testing for governmental, commercial and private customers, and provides work space and support for graduate research students. In order to operate the laboratory in a manner that ensures data quality, safe and efficient operation, a clean work environment and professionalism, specific operational procedures must be followed. **All personnel that utilize the Water Center laboratory facilities MUST follow these operational procedures. Failure to abide by the procedures will result in the personnel being referred to the PI or Laboratory Manager for corrective actions.**

1.0 Laboratory Access

The laboratory facilities are located in Prescott Hall, rooms 343, 344, 345, 419, 426, 428, and 429. Entrance to rooms 426, 428, 343, and 345 are controlled by access codes. Entrance to rooms 419 and 429 are achieved by Eagle card swipe. Access to the laboratory must be approved by the laboratory manager or his/her representative. Prior to approval, personnel seeking laboratory access must complete required safety training as designated in the laboratory's safety procedure. Also, **a project worksheet must be completed per laboratory procedure 100-130.**

Only personnel with laboratory access will be allowed in the laboratory. They **MAY NOT** be accompanied by friends or other students that have not been approved for access.

2.0 Housekeeping

Good housekeeping is a necessity for maintaining a safe, clean, and uncluttered work environment. All personnel that work in the laboratory must be responsible for his or her areas of work. Listed below are some of the guidelines that are to be followed to maintain a clean and uncluttered laboratory.

- **If you spill it, clean it up.**
- **If you open it, close it.**
- **If you used it, clean it. (Dirty glassware goes in dirty glassware containers)**
- **If you break it, notify laboratory manager or his/her representative.**
- **If you borrow it, return it.**
- **If you turned it on, turn it off.**
- **If you took it, put it back where it belongs.**

All spills on equipments, bench spaces and floors are to be cleaned up immediately. Any chemicals that are spilled on the balance during weighing, must be cleaned. Personnel must be familiar with the location and use of materials in the spill centers located in the laboratory. If hazardous materials are spilled, then these materials must be handled appropriately. The proper handling of hazardous materials is covered in safety training. If there is any question regarding the disposal of hazardous materials ask the laboratory manager or his/her representative.

Materials such as glassware, chemicals and consumables (pipet tips, gloves, syringes, etc.) that are not in use, must be disposed of appropriately. Glassware that has been utilized for the operation in progress will be placed in dirty glassware containers. Filtering apparatus must be cleaned and returned to proper storage area. Solvents and other chemical reagents must be stored according to laboratory safety procedures when not being used.

All beakers, flasks, and bottles containing materials in process must be properly labeled. Any materials left on counter tops unlabeled are candidates for disposal.

Personal belongings cannot be left in the lab work areas when individuals are not present.

Materials received for experiments in progress are to be unpacked and stored as quickly as possible after they are received.

Instruments that are used by students must be ready for the next user. This includes cleaning the instrument if applicable, removing sample vials placed in auto samplers, cleaning cuvettes, burets and other measuring devices that cannot be cleaned in the dishwasher.

Laboratory protocol must be utilized in handling gas cylinders. Individuals will receive safety training on handling gas cylinders properly. When cylinders are empty, they must be returned to the designated cylinder racks and an 'Empty' tag placed on them.

Refrigerators are often used by laboratory personnel and graduate students for the storage of samples and other materials. Approval to store anything in refrigerators must be obtained from the laboratory manager or his/her representative. All containers stored in the laboratory must be clearly identified and contain the following information:

Sample Name
Sample Owner
Date
Sample Composition:

No open containers will be stored in the refrigerator. Only designated refrigerators can be used for sample storage by students. At the end of the project, students must remove stored samples and/or materials from the refrigerators.

The laboratory manager or his/her representative will conduct monthly inspections of the laboratory facilities to make sure all users are abiding by the abovementioned procedures. **Corrective actions will be taken on personnel that neglect to follow the procedures.**

3.0 Material and Instrumentation Usage

Project sheets should list the materials and instrumentation resources required by the students. The laboratory does allow the use of consumables and reagents in small quantities; however, the needed materials should be listed on the project sheet. Preferably, the student will have a department charge account number which will allow for material usage to be charged back to the department. Consumables (distilled water, gloves, syringes, pipet tips, gases, reagents etc.) cost the laboratory money. An effective means of reimbursement would be to request interdepartmental transfer for laboratory usage.

Instrumentation is normally operated by permanent laboratory analysts. These individuals have been extensively trained to operate the instrumentation and implement necessary quality controls to generate quality data. Sufficient funds should be designated in the preparation of research grants to provide for Water Center personnel to analyze samples using instrumentation in the Water Center Laboratory.

On occasion, graduate students who require instrumentation for extended periods of time will be trained independently to operate the instruments. The use of the instruments for research purposes will be coordinated with the laboratory manager and his/her representative. A charge for the instrument usage fee will be submitted to the department. The decision on applicability of these usage fees to the Water Center Service account will be determined by the Office of Research. In projects where insufficient funds are available, this may be recorded as unfunded research by the Water Center.

The Water Center Laboratory has a significant chemical inventory. When chemical usage is small, the laboratory allows use of chemicals in inventory. Request usage of chemicals from the laboratory manager or his/her representative

4.0 Project Termination

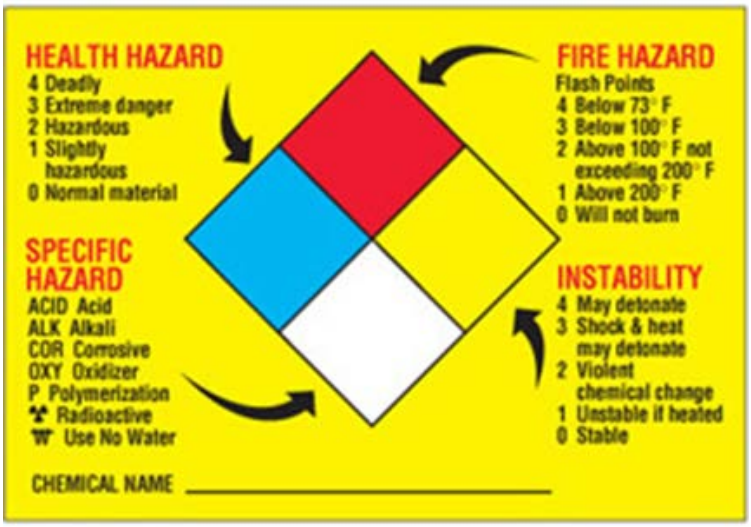
When a project has been completed by students, work areas, stored chemicals, and lab apparatus used for the experimental work must be cleaned, disassembled, disposed of and/or stored. The laboratory manager or his/her representative will sign off on the project sheet when this process has been completed. This should be a part of the exit process for graduate students completing their work at Tennessee Technological University. Additionally, project close termination must abide by the University's policy for Laboratory Checkout and Closeout Procedure: https://www.tntech.edu/assets/userfiles/resourcefiles/5075/1440521478_LABORATORY%20CHECKOUT%20AND%20CLOSEOUT%20PROCEDURE.pdf

5.0 Laboratory Safety

Providing a safe work environment is a top priority of the Water Center Laboratory. To achieve this objective, all personnel must be trained to competently implement laboratory safety practices. **All personnel working in the laboratory must complete all training specified in WRC laboratory procedure 100-140 Laboratory Training Procedure.**

The following is a listing of laboratory safe practices that must be routinely followed in the laboratory. Failure to follow these practices can result in denial of access to the laboratory.

- Wear Personal protective clothing and equipment
- Handle gas cylinders properly
- Know location of spill centers and how to use materials
- Know proper operation of fume hoods and when they should be used
- Be knowledgeable of proper disposal of hazardous materials
- Be able to access and understand Safety Data Sheets
- Know the location of eye wash stations and ability to competently use them
- Complete basic training related to fire extinguisher use and be aware of fire extinguisher location and use.
- Know protocol for contacting emergency personnel
- Know location of safety showers and how to use them
- Complete the designated safety training specified by the Laboratory Safety officer
- Be familiar with the Chemical Hazards Label and determine risk from the label printed on a reagent or chemical container. An example is shown below.



Safety is always the responsibility of the individual. The laboratory will provide the necessary resources to train personnel in the lab and will manage situations that deviate from accepted safe practices.

☐ **I have read the Laboratory Operational Procedure (100-100) thoroughly and I understand everything that has been stated here. I agree to follow them on a daily basis, and understand that my failure to abide by them can result in prohibiting my access to Water Center facilities.**

_____ _____

User Name and Signature Date

_____ _____

Faculty Advisor Name and Signature Date

_____ _____

Verified by Laboratory Manager/Staff Date