



**COLLIN  
COLLEGE**

**SPRING CREEK CAMPUS  
LAB SAFETY AUDIT**

**September 13, 2017  
Report No. 17-02**



September 13, 2017

Dr. Neil Matkin, District President

Dear Dr. Matkin:

We have completed our audit of Lab Safety at Spring Creek Campus (SCC). This engagement is included in our 2017 Audit Plan. We utilized the *International Standards for the Professional Practice of Internal Auditing* as guidance for conducting the audit. The objective of the audit was to determine if lab safety processes and procedures are effective and compliant with applicable laws, regulations, policies, and contracts, and to determine if proper controls are in place.

The audit revealed:

- water coming from the combination eyewash/safety showers looks orange and rusty;
- some laboratories and laboratory preparation areas do not have exit signage and/or exit signage is not clearly visible;
- the Biosafety Level 2 (BSL-2) laboratory does not have the correct signage posted at each entrance;
- refrigerators and freezers do not have proper signage regarding food and beverages; and
- district wide, there are some inconsistencies in the laboratory safety procedures, chemical hygiene plans, and Biosafety Level 2 (BSL-2) manuals.

Responses from management describing actions to be taken to address the recommendations, including estimated implementation dates, are included in this report. Management is responsible for implementing the course of action outlined in the responses.

Our standards require that we monitor audit issues to ensure that management action plans have been effectively implemented. Based on your estimated implementation dates, we will contact you to schedule the follow-up procedures. Our follow-up procedures may consist of reviewing compliance-related policies, procedures, or other materials developed while implementing the plan. In addition, we may perform limited procedures to ensure the plan is working as intended.



Our recommendations are provided to assist the management of Collin College District in enhancing its operations and managing its risks. We appreciate the courtesies and considerations extended to us during our engagement. If you have any questions or if we can be of further assistance, please do not hesitate to contact our office.

Sincerely,

Darren Smith  
Senior Internal Auditor

C: Dr. Brenda K. Kihl, Executive Vice President  
Dr. Bill King, Executive Director of Facilities  
Dr. Mary S. McRae, VP Provost  
Dr. Cameron C. Neal, Dean of Academic Affairs  
Dr. Rosanne M. Ciccio, Manager of Science Labs

## **SPRING CREEK CAMPUS (SCC) OBSERVATIONS, RECOMMENDATIONS, AND RESPONSES**

### **HEALTH AND SAFETY (FACILITIES)**

#### **OBSERVATION**

1. Water coming from the combination eyewash/safety showers looks orange and rusty. Lab management currently flushes the combination eyewash/safety showers once a week with the same result.

*A review performed by RWB Consulting Engineers determined “this issue to be limited to the combination eyewash/safety showers. This would suggest that the main pipe in the unit (which is part of the shower unit) has some type of ferrous piping that has either lost its coating or did not have a coating and is leaching iron into the water stream. From discussion with the staff it appears this orange colored water goes away after 10-15 seconds. It may be that a more frequent, longer flush of the safety system would minimize the iron leaching into the water.”*

#### **RECOMMENDATION**

We recommend management determine a course of action to eliminate the condition causing the water to look orange and rusty. The combination eyewash/safety showers are in place to be used in case of an emergency and the water coming from them should produce clean, clear water from first flow without having to be flushed.

#### **MANAGEMENT RESPONSE**

RWB will submit a proposal to develop a set of scope documents that will detail replacing the galvanized pipe with an ANSI approved product. The current plan is to submit a proposal to the board of trustees in October. If approved, all eye wash stations that are creating this issue will be replaced in late December.

#### **CRITERIA**

The current American National Standards Institute (ANSI) standard addressing emergency eyewash and shower equipment (ANSI [Z]358.1-2004) specify eyewash stations used in workplaces must be maintained to prevent injury and illness to workers. Eyewash stations are critical emergency safety equipment intended to mitigate eye injuries when control methods do not prevent exposure to a physical or chemical irritant or a biological agent. Whether the eyewash station is permanently connected to a source of potable water (i.e., plumbed) or has self-contained flushing fluid, improper maintenance may present health hazards that can worsen or cause additional damage to a worker’s eye.

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In order to insure that water flows freely and cleanly from a plumbed station, it is recommended that the station be tested at least once a week.

ANSI Standard Z358.1-2014 notes in sections 4.1.6, 5.1.5 and 6.1 that eye wash shower unit piping be constructed of piping such as plastic, stainless steel, epoxy coated, galvanized, or other non-corrosive type piping.

### **OBSERVATION**

2. Some laboratories and laboratory preparation areas do not have exit signage and some exit signage is not clearly visible.

RWB Consulting Engineers reviewed the existing drawings at this facility. They found *“most of the main exit doors out of the labs had vision panels and there were, at minimum, emergency light fixtures in the corridors outside of these spaces. In the event of a power failure, there would be light visible and indicating an exit pathway. It is not suggested that this takes the place of requirements for illuminated exit lighting or minimum egress lighting levels, but this would help indicate a clearly definable exit door. The NFPA standards suggest that exit signage be displayed at all the lab exits. Additional review of the requirements for exiting and exit lighting are suggested.”*

### **RECOMMENDATION**

We recommend management work with RWB and/or other experts in this area to determine what signage is needed at all laboratory exits.

### **MANAGEMENT RESPONSE**

RWB will submit a proposal to study and recommend a lighting system district wide that meets current NFPA standards. The project will be completed in the 2017-2018 fiscal year.

### **CRITERIA**

NFPA 101 (Life Safety) and NFPA 45 (Fire protection for labs using chemicals) there are different standards for a ‘B’ Occupancy than ‘E’ occupancy for exit and emergency lighting. A review of NFPA 101, section 7 suggests that if the exit is clearly definable as an exit that in a ‘B’ occupancy it may not need illuminated exit signs but having the exits clearly marked is a requirement.

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### **OBSERVATION**

3. The Biosafety Level 2 (BSL-2) laboratory does not have the correct signage posted at each entrance.

### **RECOMMENDATION**

We recommend management follow the Center for Disease Control (CDC) guidelines and post the correct signage at each entrance to the BSL-2 laboratory.

### **MANAGEMENT RESPONSE**

The correct signs were posted in June 2017 and pictures of the BSL-2 signs were emailed to the auditor for verification of correction.

### **CRITERIA**

#### **Biosafety Level 2**

Biosafety Level 2 builds upon BSL-1. BSL-2 is suitable for work involving agents that pose moderate hazards to personnel and the environment.

It differs from BSL-1 in that:

- 1) laboratory personnel have specific training in handling pathogenic agents and are supervised by scientists competent in handling infectious agents and associated procedures;
- 2) access to the laboratory is restricted when work is being conducted; and
- 3) all procedures in which infectious aerosols or splashes may be created are conducted in BSCs or other physical containment equipment.

The following standard and special practices, safety equipment, and facility requirements apply to BSL-2.

#### **A. Standard Microbiological Practices**

9. A sign incorporating the universal biohazard symbol must be posted at the entrance to the laboratory when infectious agents are present. Posted information must include: the laboratory's biosafety level, the Laboratory Biosafety Level Criteria: BSL-2 35 supervisor's name (or other responsible personnel), telephone number, and required procedures for entering and exiting the laboratory. Agent information should be posted in accordance with the institutional policy.

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### OBSERVATION

4. Refrigerators and freezers do not have proper signage regarding food and beverages.

### RECOMMENDATION

We recommend management practice due diligence and post clearly visible signage on all ice machines, refrigerators, and freezers to ensure compliance with the safety standards below.

### MANAGEMENT RESPONSE

The correct signs were posted in May 2017 and pictures were emailed to the auditor for verification of correction.

### CRITERIA

*Prudent Practices in the Laboratory (2011) - 6.C.2.3 Avoiding Ingestion of Hazardous Chemicals*, states: Eating, drinking, smoking, gum chewing, applying cosmetics, and taking medicine in laboratories where hazardous chemicals are used or stored should be strictly prohibited. Food, beverages, cups, and other drinking and eating utensils should not be stored in areas where hazardous chemicals are handled or stored. Glassware used for laboratory operations should never be used to prepare or consume food or beverages. Laboratory refrigerators, ice chests, cold rooms, and ovens should not be used for food storage or preparation. Laboratory water sources and deionized laboratory water should not be used as drinking water. Never wear gloves or laboratory coats outside the laboratory or into areas where food is stored and consumed, and always wash laboratory apparel separately from personal clothing.

*Occupational Health and Safety Standards 29 CFR 1910.141(g)(4), Sanitary storage*, states: *No food or beverages shall be stored in toilet rooms or in an area exposed to a toxic material.*

*Occupational Health and Safety Standards 29 CFR 1910.1030(d)(2)(x)*, states: *Food and drink shall not be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.*

*Occupational Health and Safety Standards 29 CFR 1910.1450 Appendix A, E.1.m*, states: *Laboratory refrigerators, ice chests, cold rooms, and ovens should not be used for food storage or preparation.*



**OBSERVATION**

5. District wide, the laboratory safety procedures, chemical hygiene plans, and Biosafety Level 2 (BSL-2) manuals are comprehensive. However, there are some inconsistencies in each at each campus.

**RECOMMENDATION**

We recommend laboratory management at SCC work with laboratory management at CPC and PRC to come up with laboratory safety procedures, a chemical hygiene plan, and a BSL-2 manual that are consistent district wide.

**MANAGEMENT RESPONSE**

The Science Laboratory Managers from SCC, PRC and CPC agree with the recommendation for the need of district-wide consistency within our laboratory safety procedures, a chemical hygiene plan, and a BSL-2 manual. Our plan of action is to compare and then merge our documents so they are consistent from campus to campus. We expect to have this project completed and implemented by the beginning of the Spring 2018 semester.

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## GENERAL INFORMATION

### CRITERIA

This audit was conducted in conformance with the Institute of Internal Auditors' *International Standards for the Professional Practice of Internal Auditing*.

This review emphasized, but was not limited to, compliance with:

- *CFR-2010 title 29 vol6 sec 1910-1450*
- *The OSHA Laboratory Standard*
- *CDC BSL-2 Guidelines*

### AUDIT TEAM

Andrew Groover, M.Ed., CPA, CIA, CICA, CISA, CFE - District Director of Internal Audit  
Darren Smith, Senior Internal Auditor

### SCOPE

The scope of our audit was fiscal year 2017. Testing was performed on a sample basis.

We visited the Central Park, Preston Ridge, and Spring Creek campuses in May and June of 2017. Our audit and evaluation included audit tests we considered necessary in determining whether administrative and operational controls are in place and working in the area of lab safety. The audit focused on procedures in effect for fiscal year 2017.

Specifically, we reviewed and tested:

- To determine that lab safety procedures are comprehensive and consistent between campuses.
- To determine that Chemical Hygiene Plans are comprehensive and consistent between campuses.
- To determine that there is a Chemical Inventory maintained for each campus and that it is accurate.
- To determine that lab staff have completed general lab safety training. This includes training on OSHA Lab Safety Standard, safety showers, flammables and explosives, electrical safety, lab hoods, contamination, glassware, emergencies and first aid.
- To determine that lab safety procedures are communicated to students prior to participating in lab activities.
- To determine that students enrolled in BioTechnology Courses have taken Bio Tech Training.

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- To determine that students that are part of the CASMNS (Center for the Advanced Studies of Math and Science) program have completed CASMNS training.
- To determine that faculty have completed Globally Harmonized System (GHS) training.
- To determine that Lab Incident Reports are properly documented.
- To determine that access to the labs is properly controlled.
- To determine that eye wash and showers are inspected each week.
- To determine that all labs contain Safety Data Sheets identifying chemicals utilized in the lab.
- To determine that personal protective equipment is being worn during lab use.
- To determine that labs are properly cleaned after each class.
- To determine that Biosafety Level-2 labs have appropriate signage on the entrance indicating that it is a BSL-2 lab.
- To determine that labs contain first aid kits, fire extinguisher, fire blanket, exit signage, and emergency shut off valves for gas, water, and electricity.
- To determine that flammable chemicals are properly stored in flammable storage cabinets and corrosive chemicals are properly stored in corrosive storage cabinets.
- To determine that lab safety inspections are being conducted routinely.
- To determine that chemicals are labeled (GHS if new or other labeling if older).
- To determine that compressed gas cylinders are properly secured with chains or straps.
- To determine that refrigerators used to store biological or chemical items are properly labeled with a "No food or drink" sign or other signage to indicate restricted contents only.
- To determine that ice machines used in labs are labeled "not for human consumption".

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- To determine that labs are free of obvious safety hazards. (ex: wet floors, extension cords across the floor but not taped down, etc.).
- To determine that Fume Hoods are inspected annually.
- To determine that Chemical Spill Stations are located in each lab and that they are clearly marked.
- To determine if the Institution has a plan in place to ensure all laboratory doors have been identified needing “No Weapons” signage once the concealed carry ruling goes into effect.