A. **PURPOSE**:

In the Firearms Unit there is the potential for the exposure to lead. Airborne lead can be created when firing a firearm using ammunition with a lead based propellant. Additionally, there is the potential of contact with lead thru spent ammunition or firearms submitted as part of case work. The goal of the Division of Scientific Services (DSS) is to minimize exposure to lead through the use of engineering controls, good work practices, proper housekeeping and use of personal protective equipment (PPE).

B. **SCOPE**:

OSHA Standard 1910.1025 requires a written compliance document for workplaces where there is a potential for exposure to lead. This document is to meet the requirements of the OSHA standard and related appendixes. The OSHA standard and related appendixes are located in the Firearms References folder within Qualtrax.

This document is written to be in compliance with the OSHA standard as a work area where the level of airborne lead does not meet or exceed the action level of 30 micrograms per cubic meter of air. This determination is based on OSHA air monitoring report dated February 18, 2020 on file with the Quality Section. The goal of the processes in this document is to minimize employee exposure to lead.

In the Firearms Unit operations that may cause exposure to lead are:
Potential for formation of airborne lead in the form of mist, dust or fume:

1. Test firing of weapons; gunshot residue (GSR) produced while shooting weapons with lead ammunition is where the majority of lead exposure can occur.
2. Cleaning surfaces in the Firing range and Tank room.

Potential for contact with residual amounts of lead (non-airborne):

3. Examining weapons; GSR may be on the surface of the weapons. Lead exposure would be due to physical contact, there is no expectation of airborne lead from this activity.
4. Examining casings and components of ammunition; GSR may be on the surface of casings. Lead exposure would be due to physical contact, there is no expectation of airborne lead from this activity.
5. Working on surfaces where lead dust has settled. Lead exposure would be due to physical contact, there is no expectation of airborne lead from this activity.

C. **RESPONSIBILITY**:

1. Management is required to make available all needed equipment and to ensure proper maintenance and monitoring of needed equipment as related to this document.

2. Deputy Director of Identification is responsible to review this document annually to determine if modifications are required.
3. All analysts assigned to the Firearms Unit, regardless of title, are required to follow the guidance of this document.

D. **DEFINITIONS**:
Definitions are as defined in the OSHA 1910.1025, Appendix A or Appendix B.

1. Action Level (AL): means employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air (30 ug/m^3) averaged over an 8-hour period.
2. Lead: means metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds
3. Permissible Exposure Limit (PEL): The Permissible Exposure Limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 ug/m^3), averaged over an 8-hour workday.

E. **PROCEDURES**: The following procedures are designed to minimize the employee's exposure to lead for all activities performed within the Firearms Unit (as listed above under the scope section).
1. Air Monitoring:
    a. Air monitoring has been performed and has established that under current conditions and during normal use, work performed in the DSS firing range and the firing tank room does not produce lead levels above established OSHA action levels (AL).
    b. This monitoring was performed by CONN-OSHA and is on file with the Quality Manager. Additional required information including date of testing, specification of testing and other items required by the OSHA standard will be maintained as part of or associated with the report.
    c. This report will be maintained for a period of 40 years or for the duration of employment plus 20 years, whichever is longer.
    d. The report was provided to all employees assigned within the Firearms Unit at time of issue to the DSS.
    e. Air monitoring will be repeated when any of the following occur:
        i. Changes occur to the work or processes performed in the firing range or firing tank areas which would increase the level of lead exposure.
        ii. Report of elevated blood lead (≥40 ug/100g) or of symptoms determined to be related to lead exposure by an examiner.

iii. Other reasons in which the DSS determines a higher level of lead exposure may be possible.

f. If any air monitoring for lead is performed based on the above, the DSS will:

i. Meet the requirements of the OSHA 1910.1025 to ensure accuracy to a confidence level of 95%.

ii. Employees will be allowed to observe the air monitoring being performed and are entitled to an explanation of the measurement process and a copy of the report provided to the DSS.

iii. Employees assigned to the Firearms Unit will be provided a copy of the testing results when air monitoring is performed.

2. Engineering and Work Practice Controls:

a. Work Practices: Safe work practices including the proper use of Personal Protective Equipment (PPE), proper use of the tank room and firing range ventilation systems and good housekeeping are essential to minimize exposure to airborne lead and lead dust that may settle on surfaces.

b. Ventilation: In the firing range and firing tank room the engineering control in place is the ventilation systems. Both rooms are under negative pressure to prevent airborne lead from migrating out of the areas.

i. Tank Room: Prior to firing any weapons the ventilation system will be turned on and the doors to the room will be closed and remain closed during use. This allows for the room to be under negative pressure. This system is designed to pull air from the room into the tank minimizing exposure to airborne lead for those firing weapons.

a) The ventilation system for this room is controlled by air handler number 3. The filters of this unit are changed quarterly by the current building maintenance contractor. Since this air is mixed with fresh air and re-circulated high quality filters are used these will have a Merv 8 or better rating.

ii. Firing Range: Prior to firing weapons the ventilation system and range snail trap system will be activated. The door to the range will remain closed while firing weapons.

a) The firing range is designed with a “push/pull” ventilation system.

i. This is designed to push air from behind the examiner towards the exhaust system.

ii. The exhaust system is designed to pull air away from those firing weapons.

b) The air handling unit for the supply air to the range is unit number 5. Air from the range exhausts directly out of the building, this does not feed into any of the air handlers.

iii. Documentation of the maintenance of the ventilation system will be maintained per normal record retention guidance of GL-18.

iv. Air Flow Monitoring: the air handling systems are monitored for proper working condition by the current building maintenance company.

Additionally, periodic checks will be performed to verify the airflow.

a) Analysts should verify that the ventilation systems are on while firing.

i. Tank: Once per week powder should be expelled at the opening of the tank; the powder should draw into the tank. Alternatively the vane anemometer can be used to verify the airflow.

ii. Firing Range: each day of use powder should be expelled at the firing line; the powder should draw toward the exhaust fans. Alternatively the vane anemometer can be used to verify the airflow.

iii. If there is an issue noted with the ventilation system weapons will not be fired until the issue is addressed. All issues must be immediately reported to the Deputy Director.

1. Additionally put a 'do not use' note on the door of the range or tank room until the issue is addressed.

b) Quarterly: air flow will be monitored to show negative pressure is maintained in both areas. This will be performed by the Safety Officer or their designee. Records of this monitoring will be maintained.

Possible methods of monitoring:

i. Vane Anemometer: this device measures airflow in feet/minute. This is the preferred method of monitoring the air flow. The goal of monitoring is to ensure that the ventilation system is working as expected maximizing the ability of the exhaust system to pull airborne lead away from the examiner.
    1. Tank: readings will be recorded to demonstrate that there are no changes to the system. Note no minimum airflow is established by OSHA for this type of tank. The goal will be to ensure that the flow is away from the examiner and into the tank.
    2. Firing range: readings will be recorded to demonstrate that there are no changes to the system. The optimal flow at the line of fire is 50-75 ft/min. Note that a higher rate is not optimal since this may raise dust in the area.

ii. Flow Checker Powder test: fine powder will be expelled and the path of the powder monitored;
    1. Range: powder should be expelled at the typical line of fire and should travel towards the far end of the range.
    2. Tank: powder should be expelled at the tank opening and should travel into the tank.

iii. The results of the quarterly monitoring will be maintained within the Firearms Unit based on record retention guidance of GL-19 “Document Control’.

c. Tacky Mats: Tacky mats are a disposable control used to minimize the transfer of lead dust that may be transferred on the bottoms of footwear. These are placed at the door to the tank room and firing range. The mats are layers of tacky material. The layers should be removed when the current layer is no longer tacky.

d. Respiratory Protection:
    i. The DSS has dust masks and N95 masks available for those that wish to use them however these are not required to be used.

ii. OSHA requires the use of respirators and associated respiratory plan when the air lead levels below the PEL cannot be achieved by engineering controls.
   a) If at any time the DSS requires the use of respirators for this work, a respirator program will be developed which will include all components as required by the OSHA 1910.1025 standard.

e. House Keeping:
   i. The range and tank room will be clean professionally no less then every year. Records of this cleaning will be maintained within the Firearms Unit as designated by the Deputy Director.
   ii. The snail trap of the firing range will be cleaned every 4 years unless there is a need to increase this interval such as increased use. Records of this will be maintained with in the Firearms Unit as designated by the Deputy Director.
   iii. Surfaces in these areas and in the Firearms laboratory spaces will be cleaned with a cleaning product designed to minimize lead exposure (D-Lead or similar). This will be done each day of use. Doing this will minimize the buildup of lead dust on surfaces which can transfer to clothing and hands.
      a) Surfaces should not be cleaned using canned air, or in a dry method as this may cause airborne lead.
   iv. Floors in the tank room and firing range will be cleaned with a vacuum containing a HEPA filtration system as needed. This will be arranged through the current building maintenance contract company.
      a) When a vacuum with HEPA filter is used precautions will be taken when emptying the vacuum to ensure that the dust does not reenter the work areas.
      b) The HEPA filters from the vacuum will be disposed of as hazardous waste. These will be placed in an appropriate container, marked as chemical waste per and stored for disposal per GL-2 'Safety'.
      c) Floors will not be cleaned in a manner that will cause dust to become airborne such as swept or cleaned with compressed air.

f. Personal Protective Equipment:
   i. Laboratory Coats – lab coats are provided as a measure to minimize transfer of lead to analysts clothing. Transfer can occur in various Unit activities as listed in the scope portion of this document. Laboratory

coats are required to be worn when handling all evidence and when firing weapons.

a) The use of lab coats helps to minimize lead from being transferred via clothing to other areas of the DSS facility.
b) Lab coats used in the Firearms tank room, firing range, and other work spaces will not be worn outside of these areas.
c) Laboratory coats should only be moved from the areas when transporting the coat for laundering.

ii. Eye Protection – Eye protection will be worn when firing weapons. Goggles are provided primarily to protect the eyes from projectiles however these do also provide a physical barrier to airborne lead created while firing weapons.
Personal eye wear can be acceptable if it is known that he glasses are safety glasses. Analysts requiring goggles to wear over glasses should inform the Deputy Director of this need.

iii. Gloves: Disposable gloves should be worn when handling evidence. Gloves can prevent lead from being transferred to the skin of the hands.

a) It is suggested that gloves be worn while test firing weapons, unless doing so will cause a physical hazard.

iv. Hand washing: D-Lead wipes and D-Lead soap (or similar products) is provided. When an analyst has performed work that had the potential to expose them to lead they will wash their hands prior to leaving the laboratory area. In the firing range D-Lead wipes are available.

a) It is suggested that analysts should use appropriate facilities to wash their hands and face after firing a weapon and prior to eating, drinking, applying make-up or smoking. This will minimize the possibility of ingesting lead.

3. Medical Surveillance:
It is suggested that analysts have lead and zinc protoporphyrin (ZPP) levels taken annually or as often as prescribed by your physician. Analysts should inform their physicians of the type of work performed where exposure to lead may occur.

a. If at any time elevated results are obtained (>40 ug/100g) this should be reported to the Deputy Director.
b. If at any time an employee has symptoms of lead exposure these should be reported to the Deputy Director.

i. The above would be the basis to have a re-assessment of air lead levels following the OSHA 1910.1025 standard.

a) At any time if it is determined that airborne lead exposure is greater than the AL, a medical surveillance program will be established and this document will be updated to meet the needs of exposure above the AL.
b) If the air monitoring results continue to demonstrate that the airborne lead levels are below the AL then work habits of the individual and/or other sources of lead should be assessed.

4. Training:
    a. Annual training will be provided to all examiners assigned to the Firearms Unit and to Supervisors of the Unit. This training will also be provided to all new employees assigned to the Firearms Unit. Training will include:
        i. The contents of the OSHA 1910.1025 standard and the related Appendix A and B.
        ii. This training will focus on the components related to work where the AL is not exceeded.
        iii. Specific work performed which may result in exposure to lead.
        iv. If at any time respirators are required, training will cover the use, selection, proper fit and limitations of the respirators.
        v. Health effects of exposure to Lead including:
            a) Reproductive/developmental toxicity
            b) Central nervous system effects
            c) Kidney effects
            d) Blood effects
            e) Acute toxicity effects
            f) Information on chelating agents.
            g) If at any time medical surveillance is required this program will be explained in the training.
        vi. Engineering controls in place.
        vii. Work practices related to minimizing exposure.
        viii. The contents of this compliance document.
        ix. Access to training documents and the OSHA standards and associated appendixes.
5. Recordkeeping:
    a. The Quality Section will maintain a copy of all records associated with air monitoring of lead levels. Records will be maintained for a period of 40 years or for the duration of employment plus 20 years, whichever is longer.
    b. Records will include:
        i. Date of sampling.
        ii. Number of samples taken.

iii. Duration of testing.
iv. Location of testing.
v. Results of each sample taken.
vi. Description of the sampling procedure used to determine representative employee exposure where applicable.
vii. Description of the sampling and analytical methods used and evidence of their accuracy.
viii. Name, social security number (or employee number) and job classification of the employee monitored and of all the employees whose exposure the measurement is intended to represent.
ix. Environmental variables that could affect the measurement of employee exposure.

c. If medical surveillance is required the records maintained will follow the guidance of the OSHA 1910.1025 standard.
d. If a medical removal is required the records of this removal will be follow the guidance of the OSHA 1910.1025 standard.
e. Records related to the record keeping portion of this compliance document will be made available to the OSHA Assistant Secretary and Director as requested. Additionally they will be made available to employees or their representative upon request.

F. **REFERENCES**:

1. OSHA 29 CFR 1910.1025 Standard
2. OSHA 29 CFR 1910.1025 Appendixes A-D.
3. OSHA Fact Sheet: Protecting Workers from Lead Hazards at Indoor Firing Ranges
4. OSHA Quick Card: Protecting Workers from Lead Exposure at Indoor Firing Ranges