

NC Division of Waste Management Radiation Protection Program

Annual Review due in September

Purpose of Program

The NC Division of Waste Management utilizes a NITON XRF (S/N 6550), which contains radioactive material to detect and qualify the amount of metals in soil and other environmental media. This program serves as guidance to ensure the safe operation and use of radioactive materials.

1. Authorized Users of Radioactive Material:

Only the following employees are authorized to use the NITON XRF for its intended purpose.

Brian N. Polk, RSO	see training certificate
Harry Zinn	see training certificate
James Beatson	see training certificate
Stuart Parker	see training certificate
Dave Lilley	see training certificate
Dave Mattison	see training certificate
Melanie Barlette	see training certificate
Jeanette Stanley	see training certificate
David Lown	see training certificate
Randy McElveen	see training certificate
John Walch	see training certificate
Elizabeth Werner	see training certificate

Or individuals who are employed by the State of North Carolina- Division of Waste Management, having successfully completed a manufacturer's training program for the gauge users, have been instructed in the licensee's routine operating and emergency procedures, and who have been designated in writing having completed these requirements by the Radiation Safety Officer.

2. Radiation Safety Officer

Brian Polk has met the qualifications as outlined in NC DENR DRP Publication L-001 and will serve as Radiation Safety Officer for the Division of Waste Management. The RSO will ensure that all users will: (1) be employees of the Division of Waste Management, (2) have completed the manufacturer's training course, (3) have attended and been instructed in the NC Division of Waste Management's operating and emergency procedures, and (4) be designated in writing by the Radiation Safety Officer prior to using the gauge. The RSO will also ensure that records of training for authorized users will be

maintained on file for a minimum of (3) three years after the employee separates for the Division.

3. Radioactive Material

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|------------------|--|
| A. Americium-241 | A. Sealed Source (Niton XRF model XLt, no source to exceed 30 mCi) |
| B. Cadmium- 109 | B. Sealed Source (Niton XRF model XLt, no source to exceed 40 mCi) |

4. Use of Radioactive Material:

The device will be used for the analysis of contamination in sites located throughout the State of North Carolina.

5. Radiation Detection Meter:

The Division will maintain access to a calibrated survey meter through the NC Radiation Protection- Radioactive Materials Branch on an as needed basis.

6. Dosimeters:

Each quarter a thermoluminescent dosimeter (TLD) will be issued to all personal who use, transport, or perform maintenance on the Niton XRF and will be exchanged quarterly. The supplier is Troxler Electronic Labs and their NVLAP certification is enclosed. The Division will ensure dosimeter use before the gauge is utilized.

7. Facilities and Equipment:

- A. While in storage, the gauge is locked in the supplied transport case, which is locked in a secured lockable cabinet. The cabinet is attached to the wall. The gauge and cabinet are located inside a locked storage room. The storage room door is locked while the gauge is present and the outside doors to the building are locked after work hours. The building has 24-hour security provided by York Property Security. Access is limited to those employees that have been certified users by the NC Division of Waste Management's radiation safety program. For authorized users to gain access to the gauge, the user must contact the Radiation Safety Officer or Harry Zinn (secondary) to access the storage cabinet. Only the Radiation Safety Office and Harry Zinn have access to the storage cabinet. The user must use the utilization log.
- B. NC Division of Waste Management is committed to keep radiation doses as low as reasonably achievable (ALARA) as outlined in Section D. 1. And 2. Operating and Emergency Procedures of this document. Also attached, calculations used to determine Dose limits for individuals of the public as specified in 15A NCAC 11.1611.
- C. Each permanent storage area has, posted in a conspicuous place, a sign bearing the radiation symbol and the words "Caution Radioactive Material."

Also posted are copies of the "Notice to Employees' and Workers' information as outlined in 15A NCAC 11.1002 and .1604

- D. See Section 14 C.1 through C.3 of this document for procedures on securing gauge to a temporary job site.
- E. See Section 14 D.1 A and B of this document for procedures on maintaining security and constant surveillance of the gauge while in use and how the gauges will be secured from unauthorized removal/damage during off hours.
- F. Whenever possible the gauge will be returned to its permanent storage location. However, when job requirements are such i.e. distance from job site to permanent location, or workload schedule does not allow time for return of the gauge to its permanent storage location, then the gauge will be secured under triple lock within the transport vehicle. The gauge must be chained to the body of the transport vehicle.
- G. The NC Division of Waste Management leases space from York Properties INC. at 401 Oberlin Road. A letter from the building owner, Mr. Thomas Taff is attached indicating that he is aware that the device is stored at 401 Oberlin Road.
- H. The local fire department will be notified of the storage location for the radioactive material at our facility, which is within their jurisdiction. Certified mail receipt is enclosed.

8. Leak Testing:

Gauges will be leak tested at intervals not to exceed six (6) months, and will be performed using the Troxler Model 3880 Leak Test Kit. The leak test will be performed according to the manufacturer's instructions and the results will be provided by Troxler Electronic Laboratories, INC., 3008 Cornwallis Road P.O. Box Research Triangle Park, NC 27709.

9. Maintenance of the Gauge:

- 1. Maintenance will include periodic cleaning of the gauge, at this time personnel monitoring devices will be required.
- 2. No maintenance will be performed in which the radioactive source is removed from the gauge. For this type of maintenance the device will be returned to the manufacture.

10. Transportation of the gauge to and from field locations:

- 1. When traveling to and from the temporary job site, all possible means shall be provided to ensure the instrument is secured in the transporting vehicle and that equipment is away from the passenger compartment. When transporting in an enclosed vehicle, ie van, the vehicle will be locked.
- 2. The gauge will be transported in the NITON transportation case.
- 3. The operator will have properly completed transportation forms for the gauge at all times.

4. When not in use the instrument will be under triple lock.

11. General Operation and Emergency Procedures:

1 Operating Procedures:

- a. In the field, authorized user must maintain control of the gauge at all times. The gauge will never be left unattended. The gauge will be placed in the transporting vehicle when not in use. In addition, the gauge will be chained inside the vehicle when not in use. Vehicle's keys must stay with the user.
- b. The gauge will be placed in the supplied transportation case and returned to its storage area when not in use. The gauge will be used for its intended purpose only.
- c. When using the equipment, the user will wear the personal monitoring device they have been assigned. When equipment is not in use, personal monitoring device is to be stored in a radiation free area.

2. Emergency Procedures:

- a. In the event of physical damage to the gauge, these steps shall be followed:
 1. Immediately cordon off an area around the gauge. An area with a radius of 15 feet will be sufficient.
 2. If a vehicle is involved, it must be stopped until the extent of the contamination, if any can be established.
 3. A visual inspection of the gauge is to be made to determine if the source housing and / or the shielding had been damaged. If physical damage is observed, the instrument must be immediately returned to the manufactures' transportation case.
 4. At the earliest time possible, when the situation is under control, the user must call immediately Brian Polk, at (919-508-8421, 828-221-0785, 919-270-3003) and describe the present conditions and follow the instruction of the Radiation Safety Officer.
- b. In the event the gauge is lost or stolen; the Radiation Safety Officer as listed above in Item 2.A.4 **shall be notified immediately.**

12. Waste Disposal:

The Division of Waste management will either (1) transfer the gauge to another specifically licensed individual who is licensed for that particular type, form, and quantity of radioactive material, (2) transfer the gauge to the manufacture, (3) transfer the gauge to a licensed disposal facility.

Additional Documents Required For Licensee

1. To satisfy the requirements of 15A NCAC 11.1603 (C.), "Annual Radiation Production Review," the format in DRP Publication L-001 will be used.
2. Physical inventory of sealed sources is performed, at a minimum, every six months. A copy of the latest in inventory is attached.
3. Utilization logs will be maintained at the permanent storage location and will contain the following: date out, name of authorized user, make, model and serial number of the device, date returned to storage and signature of authorized employee who returned the gauge.
4. The Division of Waste Management is a State agency under the Department of Environment and Natural Resources. The Division Director is Dexter Matthews.
5. A. Occupational Dose Limits for Adults:
The Division is committed to limiting annual exposures to less than 5 rems total effective dose equivalent.
- B. Dose to an Embryo/Fetus per 15A NCAC 11.1610:
The NC Division of Waste Management will ensure that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, dose not exceed 0.45 rem (4.5 mSv) by the way of monthly field badges. If the dose to the embryo/fetus is found to have exceeded 0.45 rem (4.5 mSv) by the time the woman declares pregnancy the licensee shall be deemed to be in compliance providing additional dose to the embryo/fetus does not exceed 0.05 rem (0.5 mSv) during the remainder of the pregnancy.
- C. Dose Limits to the General Public per 15A NCAC 11.1601:
Regulations require licensees to demonstrate that the total effective radioactive dose equivalent to an individual member of the general public does not exceed 100 mrem per year. Using the formula obtained from Troxler Electronic Labs, Inc. a calculation will be made to determine this dosage for the gauge on an annual basis as needed when conditions change.

Brian N. Polk, RSO