NCDENR

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

RADIATION PROTECTION SECTION

RADIOACTIVE MATERIALS BRANCH

GUIDE FOR THE PREPARATION OF APPLICATIONS TO USE SEALED SOURCES IN PORTABLE NUCLEAR GAUGING DEVICES

REVISION 2
ISSUED JULY 2004

NORTH CAROLINA
RADIATION PROTECTION

LICENSING CHECKLIST FOR PORTABLE NUCLEAR GAUGE LICENSES

INSTRUCTIONS FOR USE: Use the checklist below to ensure that all required information is transmitted to the agency with your application for a Radioactive Materials License. INCLUDE a copy of this checklist with the application. Mail **ONE** copy of the appropriately signed application form with enclosures/attachments to: ***Branch Head, Radioactive Materials Branch, 1645 Mail Service Center, Raleigh, NC 27699-1645.***

This Guide is not intended to, an does not, create any rights or privileges, substantive or procedural, which are enforceable by person. The publication of this guide, or any version thereof, does not place any limitation of the otherwise lawful prerogatives or discretion of the Radiation Protection Section.

INTRODUCTION

The Radiation Protection Section, Radioactive Materials Branch (the "agency") is publishing this guidance document to provide applicants with direction and guidance on filing applications with the agency. This guidance is applicable to prospective licensees who are applying for a radioactive materials license and to current licensees who are applying for license renewal.

This guide is not intended to be a substitute for the applicants radiation safety program. It is the applicant's responsibility to review the North Carolina Regulations for Protection Against Radiation (15A NCAC 11) for those areas which directly impact the applicant's radiation safety program. In particular, all applicant's must read and understand Sections .0100 "General Provisions," .0300 "Licensing of Radioactive Material," .1000 "Notices: Instructions: Reports and Inspection," .1100 "Fees," and .1600 "Standards for Protection Against Radiation" prior to applying for a radioactive materials license. Other Sections of the North Carolina Regulations may be applicable to the applicant's particular use of radioactive materials. Review the Table of Contents to ensure that ALL applicable sections of 15A NCAC 11 have been properly addressed.

The agency will evaluate an application against two standards: (1) The North Carolina Regulations for Protection Against Radiation, and (2) good health physics practices based upon Federal guidance and industry practice. Included in North Carolina's regulations is the ALARA concept (15A NCAC 11 .1603(b)). This regulation requires the licensee to keep exposures as far below the applicable limits established in Section .1600 as reasonably achievable. License applicants should give due consideration to this philosophy when developing policies and procedures which encompass work with radioactive materials.

After a license is issued, the licensee must conduct the radiation safety program in accordance with (1) The North Carolina Regulations for Protection Against Radiation in 15A NCAC 11 *et. seq.*, (2) all aspects of the license and its conditions, and (3) all statements, representations, and procedures contained in the licensee's application.

In order to properly process an application for a radioactive materials license, the application form MUST be completely and properly filled out. **Appendix A** of this document contains an example of a properly completed application form. The following summary will explain the different parts of the form in greater detail.

HOW TO FILE

Complete Items 1 – 3 & 5 of the application form on the form itself (if space allows). For items 4 & 6 – 15, submit the required information on supplementary pages. You should identify each supplemental page as an attachment or addenda item.

Please note that all materials furnished to the agency for review are public documents once the agency has taken final actions on them (*i.e.*, issuance of a license). As such, do not submit information that is proprietary or confidential unless absolutely necessary. If proprietary or confidential information must be submitted with the application, this information should be separated from the application package and a detailed explanation of why the information should be maintained as proprietary or confidential must accompany the application. The agency does have a mechanism for securing the proprietary/confidential materials if necessary. However, if the agency does not agree with your evaluation of the proprietary or confidential nature of the information, it will be returned to you with a letter

of explanation.

The applicant should not make commitments to the agency which are more restrictive than the requirements outlined in the regulations or in this guide. If you wish to be more restrictive than the agency, make an internal policy statement to that effect. Likewise, avoid using "vague" terms to define frequencies for completion of tasks. State that "Task A will be completed at intervals not to exceed six months," rather than stating "Task A will be completed twice per year."

If you wish to request an exemption from any regulation or agency requirement (reference 15A NCAC 11 .0106(a)), this **MUST** be submitted under separate cover. The request should be specific and provide data and/or rationale which supports your request. All requests for exemptions should be directed to ***Branch Manager, Radioactive Materials Branch, 1645 Mail Service Center, Raleigh, NC 27699-1645.***

The applicant should retain a copy of the application and attachments, as well as all correspondence with the agency regarding the application. If the license is issued, the application becomes an integral part of your overall radiation protection program.

If the application is being filed for renewal of an existing license, the applicant should begin gathering materials approximately six months prior to the expiration of the license. 15A NCAC 11 .0339(a) specifically addresses renewal of licenses. It is strongly recommended that the applicant submit his renewal application 90 days prior to the expiration of the license. This will allow the agency time to review the application and request additional information if necessary. As a courtesy, the licensee may receive a notification from the agency stating that the license is about to expire. Such notices, if sent, are normally mailed 90 days prior to license expiration. **NOTE: It is the LICENSEE'S RESPONSIBILITY to file a renewal application in a timely manner [*as defined in 15A NCAC 11 .0339(a)*].** Not receiving a courtesy notification from the agency **DOES NOT RELIEVE** the licensee from the filing requirements.

If the applicant is seeking a reactivation of a terminated license or is filing for a new license, submit the appropriate information to the agency at least 90 days prior to the expected first usage of radioactive materials. This will allow the agency time to review the materials and make request for additional information (pursuant to 15A NCAC 11 .0108(a)) as necessary.

The application should be submitted on clean, 8½" x 11", white paper. All pages in the application should be numbered consecutively, beginning with the application form as page 1, in the lower right-hand corner of the page. Drawings and/or floor plans do not have to be drawn "to scale." The application and all attachments and/or addenda should be typewritten. The agency will accept handwritten application forms provided that the information is printed legibly on the form. ***DO NOT SUBMIT A DUPLICATE OF THE APPLICATION***. Applications should be mailed to: ***Branch Manager, Radioactive Materials Branch, 1645 Mail Service Center, Raleigh, NC 27699-1645.***

NOTE: If the agency receives an application that is not signed by the appropriate corporate official, the entire package may be returned to you without review.

EXPLANATION OF THE INFORMATION REQUESTED IN THE APPLICATION FORM

✓	ITEM		DISCUSSION/REQUIREMENTS
☐	**Item 1:**	**Name and Addresses of the Applicant**	The name and address of the facility to be licensed. The name MUST be the legal business name of the entity applying for licensure. The address entered in Item 1(a) should be the mailing address and in Item 1(d), the physical (street) address of the place of use and/or storage. ***NOTE: The agency will only license ONE PHYSICAL ADDRESS. If the applicant wishes to have multiple physical addresses, then one license application FOR EACH ADDRESS must be submitted.*** All zip codes must be in the "ZIP + 4" format. Telephone and facsimile numbers should begin with area code and telephone extensions should be included where applicable. E-mail addresses should be in the form *"me@here.net"* These telephone and facsimile numbers and the e-mail address should be for the individual who is to be contacted about the application, usually the R.S.O.
☐	**Item 2:**	**Department(s) to use Radioactive Materials**	Please state the name(s) of the departments which will be using the radioactive materials
☐	**Item 3:**	**Application type**	Please check the appropriate box. If renewing or making application to re-active a terminated license, please indicate the license number in the appropriate section.

NOTE: ***Items 4 and 6 - 15 should be completed on 8½" x 11" paper and attached to the properly signed application form.***

☐	**Item 4:**	**Individual User(s)**	In this section of the form, reference the appendices or addenda where the individual users are named. Training for the users listed in this item should be addressed under Items 8. and 9.
☐	**Item 5:**	**Radiation Protection (Safety) Officer**	The Radiation Safety (Protection) Officer (R.S.O.) MUST be named in this section. Pursuant to 15A NCAC 11 .0317(a)(2), there are minimum qualifications for the R.S.O. which must be met by the applicant's proposed R.S.O. prior to the issuance of a radioactive materials license. **Appendix B** lists the minimum qualifications for a portable nuclear gauge license R.S.O.
☐	**Type & Category**		The agency has included this information into the application form to better assist us in grouping/classifying our licensees. Please check ONLY ONE "Type" and ONLY ONE "Category" from the listing.
☐	**Item 6:**	**Radioactive Material (element, mass no., physical/chemical form, possession limit**	In section (a) of this item, list the element and mass number of EACH isotope to be used under the license (*e.g.*, Cesium-137). In section (b) of this Item, please indicate the form (*e.g.*, sealed source) and the maximum number of millicuries PER SOURCE you wish to possess at any one time (*e.g.*, No single source to exceed 50 millicuries). If requesting more than one isotope, the listing in 6(a) should clearly be matched to the respective form and quantity in 6(b) (see example in **Appendix A**).
☐	**Item 7:**	**Describe the purpose for which the radioactive materials will be used**	The purpose for which the radioactive material is to be used should be listed in this section. Each use should clearly cross-reference the isotopes listed in Item 6 of the form (see example in **Appendix A**).

✓	ITEM	DISCUSSION/REQUIREMENTS
☐	**Items 8 & 9: Training of Each Individual Named In Item 4.**	In accordance with 15A NCAC 11 .0317(a)(2), the training and experience for EACH individual who will be using radioactive material should be included with the application for review by the agency. Refer to **Appendix B** for what the agency considers the minimum acceptable training for authorized users and RSO's. **DO NOT SUBMIT ORIGINALS OF THESE DOCUMENTS.** ***NOTE: During an audit of an authorized user, the agency requires the user to provide identification and proof of training. The licensee MUST develop a method for identification of employees who are authorized to operate the gauge and this ID must be available for review at the time either a field or home office audit.*** **Appendix F** of this document contains an example of a portable gauge license. Note that Condition No. 12.C. contains this requirement
☐	**Item 10: Radiation Detection Instruments Available for Use**	While the agency does not require portable gauge licensees to possess a survey instrument, the agency does recommend having one available for use. ***NOTE: If you intend on performing service(s) on your portable gauge(s) which would necessitate the removal of the source rod, the agency requires that you possess a survey instrument pursuant to 15A NCAC 11 .0317(f)(2).***
☐	**Item 11: Method, frequency, and standards used in calibrating the instruments listed in Item 10.**	If a survey instrument is required, the applicant must submit procedures on how the instrument will be calibrated. If the applicant plans to contract with a firm to perform the calibrations, submit that firm's name, address and license number.
☐	**Item 12: Film Badges, TLD's, Dosimeters, and Bioassay Procedures Used.**	The agency has determined that users of portable nuclear gauges have the potential to receive doses in excess of 10 percent (10%) of the maximum dose limits specified in the Regulations. Therefore, the agency requires dosimetry for all persons who use the gauge. The dosimetry may be either film badges, thermoluminescent dosimeters (TLD's) or other approved technology. Exchange frequency may be monthly (if using film badges) or quarterly (if using TLD's, etc.) Pursuant to 15A NCAC 11 .1613(c), the dosimetry vendor you choose must be certified by the National Voluntary Laboratory Accreditation Program (NVLAP) for the type of personnel dosimetry ordered. Provide the name and address of the vendor, the type of dosimetry (*i.e.*, TLD or film badge), and the exchange frequency (*i.e.*, monthly or quarterly) in this area of the application. The applicant should also discuss the use of extremity dosimetry if applicable.
☐	**Item 13: Facilities and Equipment**	Submit the following information as an attachment to your application: A. A drawing of the floor plan of the permanent storage location listed within Item 1(d) of the application form. Each floor plan should include all entrances to the room(s) and surrounding areas (see 15A NCAC 11 .0317(a)(4)). These drawings to not have to be "to scale"; B. Include a description of the proposed postings for the storage area (see 15A NCAC 11 .1002 & .1624 for additional information)

✓	ITEM	DISCUSSION/REQUIREMENTS

C. If the applicant is leasing or subleasing office space from an individual other than the applicant, provide the agency with a letter from the owner of the building which states the owner is aware that radioactive materials are being stored on the premises and he has no objections to this practice (see below);

D. Commit to notifying local fire department(s) of the storage location of radioactive material at your "home" facility;

E. Provide the agency with an letter which states that the physical address listed in the license application is NOT a primary residence.

NOTE: ***The General Statutes of North Carolina (G.S. 104E-11) do not allow administrative inspection of the possession, use, or storage of radioactive material within a private residence. Therefore, the agency will not license your proposed facility if the facility can, in any way, be construed as a residence.***

☐ **Item 14: Radiation Protection Program**

The licensee is responsible for implementing a radiation protection program and for all actions of the licensee's employees. The agency's expectation is that applicants develop and document their radiation protection program in a format similar to a manual. This format should outline all of the areas of the radiation protection program and either contain procedural information or reference that information. In developing a "manual" for radiation protection, this will allow new uses to familiarize themselves with the program elements quickly and allow for ease of review by corporate auditors or the agency. Listed below are the areas which, at a minimum, must be addressed within the "Radiation Protection Program" submitted by the applicant. Please note that this list is a MINIMUM and there may be additional requirements discussed below which MUST be included in the application:

A. Radiation Protection (Safety) Officer duties and responsibilities;
B. Authorized user training and re-training (inservices);
C. Leak Testing of Sealed Sources;
D. Physical Inventory of Sealed Sources;
E. Transportation of Radioactive Materials;
F. Dose Limits and Personnel Dosimetry;
G. Operating and Emergency Procedures;
H. Security and Control of Radioactive Materials;
I. Disposal of radioactive materials
J. Labeling and Posting;
K. Periodic reviews of the radiation protection program
L. Routine maintenance procedures

Remember, this is a limited listing of topics to be included in the Radiation Protection (Safety) Program. See "Additional Information " below for a detailed explanation of these areas and requirements.

☐ **Item 15: Gauge Disposal**

Disposal options available at this time are (1) transfer of the gauge back to the manufacturer, (2) transfer of the gauge to a person who is specifically licensed to receive, use, and possess that type of radioactive material, or (3) transfer to a licensed disposal facility. Please check with the agency prior to disposal of the gauge. Please refer to 15A NCAC 11 .0343 for additional information on transfer of radioactive materials.

✓	ITEM	DISCUSSION/REQUIREMENTS
☐	**Item 16: Certification** **NOTE:** ***If the agency receives an application that is not signed by the appropriate corporate official, the entire package may be returned to you without review.***	The application form represents not only a request to become licensed to possess radioactive material in North Carolina, but it is a legal and binding agreement between the licensee and the State of North Carolina. ***Item 16 MUST be completed on the form itself. The form should be signed by: (1) the owner if a sole proprietorship; (2) a general partner if a partnership; or (3) the President or other corporate officer of the company if a corporation.***

Please proceed to the next page of the licensing guidance. There are additional requirements that MUST be addressed.

Appendices follow page 12 of the guidance.

ADDITIONAL INFORMATION NECESSARY FOR LICENSING

Listed below are other areas which **MUST** be fully addressed prior to a license being issued by the agency. They should be included as attachments or addenda, or incorporated into the radiation protection program. Where possible, the applicable reference from the North Carolina Regulations for Protection Against Radiation (15A NCAC 11) has been cited. The applicant should read and understand all of the cited references. Additionally, the agency has guidance available on its website (*www.ncradiation.net*) for some of the areas identified in this licensing checklist.

✓	ITEM	DISCUSSION/REQUIREMENTS
☐	**15A NCAC 11 .1603(c): Radiation Protection Programs – Annual Review of the Radiation Protection Program**	This must be done by the licensee, and is usually done by the Radiation Safety Officer. This review should encompass all areas of the program as outlined in your license application. The applicant is to include its proposed format for conducting the annual review of the program in the license application for review. **Appendix E** of this guide contains the format for what the agency considers to be a comprehensive annual program review. You may copy and use this form for your program. If you choose to use the form in this guide, simply state in the application that the format from the licensing guidance will be used to conduct and document the annual program review. Appendix E is also available as a single document on the Branch website. [see "***Section 1600 FAQ***" portion of our website – *www.ncradiation.net* – for additional information].
☐	**15A NCAC 11 .1604: Occupational Dose Limits for Adults**	The licensee must establish a policy which states the limits for occupational dose. Though not required by the regulations, establishing ALARA limits is considered a good practice (see "***Section 1600 FAQ***" portion of our website – *www.ncradiation.net* – for additional information).
☐	**15A NCAC 11 .1610: Dose to Embryo/Fetus**	Provide a policy which addresses this regulation. The policy MUST be voluntary in nature and MUST define a declared pregnant worker (reference 15A NCAC 11 .0104(28)) [see "***Section 1600 FAQ***" portion of our website – *www.ncradiation.net* – for additional information].
☐	**15A NCAC 11 .1611 & .1612: Dose Limits For Individual Members of the Public (and compliance)**	Provide a commitment to keep radiation doses to unrestricted areas as far below the limits specified in 15A NCAC 11 .1611 as possible. Additionally, the licensee must submit procedures, policies, calculations, etc. to demonstrate compliance with the above referenced regulation. Please refer to **Appendix G** of this document for additional information.
☐	**15A NCAC 11 .1622: Security of Sources of Radiation**	The applicant shall provide procedures for ensuring that all sources of radiation are secured from unauthorized removal or access. In order to address this topic, applicants need to describe how the gauges are to be secured in the following situations: 1. while in storage at the "home office"; 2. while in transit (including overnight storage at temporary jobsites as necessary); and, 3. while in use at a jobsite. Applicants need to discuss engineering and administrative control to secure their sources of radiation and radioactive materials. BE SPECIFIC. Discuss the measures which will be used. Discuss "key control" and other aspects of keeping radioactive materials secure.

✓	ITEM	DISCUSSION/REQUIREMENTS
☐	**Authority to sign licensing requests**	Use the agency form "Memorandum to All Licensees" if upper management wishes to delegate signature authority to another individual in the organization. If this authority is granted, the agency recommends delegation to a position rather than to a specific individual (e.g. R.S.O., Vice President, etc.)
☐	**Training requirements and duties & responsibilities for the R.S.O.**	Refer to **Appendices B & C** of this guidance document for specific training requirements and duties for the Radiation Safety Officer.
☐	**Physical inventory of sources**	This must be done on a six month frequency. You should submit a copy of the physical inventory logs which will be used by your company. Physical inventory records must, at a minimum, contain (a) type, form, and quantity of radioactive material, (b) location of the sealed source, (c) date of the inventory, and (d) name or initials of person conducting the inventory;
☐	**Leak testing procedures**	A licensee must perform periodic testing of sealed sources to determine if there is any "leakage" of radioactive material from the capsule. The tests are performed at six-month intervals and the method of analysis of the test must be capable of detecting 0.005 microcurie (0.005 µCi) of radioactivity. The agency (1) allows a licensee to contract with a consultant or commercial firm for leak testing and analysis, (2) allows the use of a commercial leak test kit sent to a commercial service or registered consultant for analysis; or (3) allows the licensee to perform and analyze the test on site (reference 15A NCAC 11 .0317(f)(2)). Whichever option is chosen, the procedures must be submitted to the agency for review. If you are using a commercial service or a consultant, please provide the name and address, license number, registration number (if applicable) and other information pertaining to the service/consultant. If you are conducting the test yourself, please submit procedures covering the leak testing and the instrumentation (including the manufacturer's make and model number(s)) utilized to analyze the test.

✓	ITEM	DISCUSSION/REQUIREMENTS
☐	**Transportation of Radioactive Material**	This must be done in accordance with 15A NCAC 11 *et. seq.* and the Department of Transportation (D.O.T) regulations contained in Subparts C, D, E, G, and H of 49 CFR Part 172 (shipping papers, marking, and labeling requirements, emergency response, training); Subpart I of 49 CFR Part 173 (Class 7 (Radioactive) Materials), and Subpart B of 49 CFR Part 177 (blocking & bracing, minimum distances). This guidance is not designed to provide the applicant with in-depth discussions of D.O.T. regulations. However, the agency has included, in **Appendix D**, an example of a Bill of Lading (Shipping Paper), Emergency Response Information, and minimum distances between driver and package during transport. The Emergency Response Information is also available as a single form on the Branch website. Each applicant is strongly encouraged to obtain a copy of the D.O.T. regulations, which may be accessed through their website (http://hazmat.dot.gov). Copies of the regulations may also be purchased from the U.S. Government Printing Office (http://access.gpo.gov) and through many private businesses. When changes to the D.O.T. regulations are made known to the agency, we strive to post them to our website. These may be found in the **HOT TOPICS** portion of the website. Please visit this page often, as the D.O.T. regulations can – and do – change regularly.
☐	**Agency notification in the event of accidents, theft or loss**	Several sections of the North Carolina Regulations for Protection Against Radiation deal with reporting requirements. In general, licensees should call the agency whenever an incident occurs. However, there are specific instances where telephone and/or written notification are required. Please review 15A NCAC 11 .0357, .1645, and .1646. Develop policies and/or procedures to address agency notifications.
☐	**Security of use and storage areas**	Pursuant to 15A NCAC 11 .1622, each applicant must address the issue of security. Please discuss the administrative and engineered controls which will be used to secure from unauthorized access or removal all sources of radiation or radioactive materials. This includes waste storage areas also.
☐	**Financial Assurance and Record-keeping for Decommissioning**	Each applicant is required to determine whether or not they must provide financial assurance for decommissioning. The "test" for making this determination can be found in 15A NCAC 11 .0353(f). Additionally, the agency has placed guidance on the website (*http://www.ncradiation.net/*) concerning financial assurance. If no financial assurance is required, so state. If the determination indicates that financial assurance is required, consult the website and contact a member of the Radioactive Materials Branch for additional guidance.

✓	ITEM	DISCUSSION/REQUIREMENTS
☐	**Legal business name information**	Pursuant to the North Carolina General Statutes 104E-5(11) and 104E-10(b), radioactive materials licenses are only issued to "persons." A corporation is not a "person" until it has been authorized by the North Carolina Secretary of State to conduct business within North Carolina. For this reason, the corporate applicant must submit documentation from the Secretary of State's Office which shows that it is authorized to conduct business within the State. Sole proprietorships and General Partnerships do not require this documentation. Acceptable documentation will be in the form of a "Certificate of Incorporation" (for N.C. companies) or a "Certificate of Authority" (for out-of-state companies). A radioactive materials license will NOT be issued until such documentation has been submitted to the agency for review. If you have questions on what type of documentation you need to submit, contact the Secretary of State's Office, Corporations Division at (919) 807-2225 or visit their website. A Professional Association (P.A.) or a Professional Corporation (P.C.) must submit a certificate of registration issued by the appropriate licensing boards. If you have questions concerning this documentation, contact the appropriate licensing board directly.
☐	**Landlord awareness**	If the applicant does not own the property listed in Item 1(d). of the application form (*e.g.*, the "home" office), the agency requires that the applicant provide a letter from the landlord stating that he/she is aware that radioactive materials are being used and stored at the facility.

APPENDICES TO "GUIDE FOR THE PREPARATION OF APPLICATIONS TO USE SEALED SOURCES IN PORTABLE NUCLEAR GAUGING DEVICES"

APPENDIX A: EXAMPLE OF PROPERLY COMPLETED APPLICATION FORM

NCDENR
North Carolina Department of Environment and Natural Resources

RADIOACTIVE MATERIALS BRANCH
RADIATION PROTECTION SECTION

APPLICATION FOR RADIOACTIVE MATERIALS LICENSE

(RMB USE ONLY)
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INSTRUCTIONS: Complete Items 1 through 16, using additional sheets as necessary. Refer to the accompanying licensing guide for instruction concerning completing this form. Item 16 **MUST** be completed on all applications. Mail **ONE** copy to: ***Branch Manager, Radioactive Materials Branch, Radiation Protection Section, 1645 Mail Service Center, Raleigh, NC 27699-1645.*** Upon approval of this application, the applicant will receive a Radioactive Materials License issued in accordance with the requirements contained in Chapter 104E of the General Statutes and Chapter 11, Title 15A of the North Carolina Administrative Code.

1.(a) NAME AND MAILING ADDRESS OF APPLICANT
The ABC Paving Company, Inc.
123 Any Street, Anytown, NC 12345-6789

(b) TELEPHONE NUMBER (919)123-4567
(c) FACSIMILE NUMBER (919)456-7890
(e) E-MAIL ADDRESS* daniel.doe@abcpavingcoinc.com
**This address should be for the primary point of contact for the applicant*

1.(d) PHYSICAL ADDRESS(ES) AT WHICH THE RADIOACTIVE MATERIAL WILL BE USED (Include temporary jobsites if applicable)
123 Any Street, Anytown, NC 12345-6789 and at temporary jobsites throughout North Carolina.

2. DEPARTMENT(S) TO USE RADIOACTIVE MATERIALS
Paving and Grading

3. THIS APPLICATION IS FOR (check one):
☐ NEW LICENSE
☒ RENEWAL OF LICENSE NO. 999-9999-9
☐ REACTIVATION OF LICENSE NO.

4. INDIVIDUAL USER(S)
See Attached

5. RADIATION PROTECTION(SAFETY) OFFICER
Daniel S. Doe

CHECK THE TYPE AND CATEGORY OF LICENSE YOU ARE APPLYING FOR:

TYPE (check one only)

☐ MEDICAL*
☒ INDUSTRIAL/NON-MEDICAL
☐ ACADEMIC

CATEGORIES (check one only)

☐ BROAD SCOPE
☐ HOSPITAL-BASED
☐ NON HOSPITAL BASED
☐ OTHER (describe)
☒ PORTABLE NUCLEAR GAUGE
☐ FIXED NUCLEAR GAUGE
☐ INDUSTRIAL RADIOGRAPHY
☐ SERVICE/CONSULTANT
☐ MANF. and/or DISTRIBUTION
☐ IRRADIATOR (including panoramic)

** Medical means that the radioactive materials will be used by physicians in the treatment or diagnosis of humans*

IN ORDER TO COMPLETE THIS LICENSE APPLICATION YOU WILL NEED TO OBTAIN THE APPROPRIATE LICENSING GUIDE. CLICK HERE TO BE DIRECTED TO THE LICENSING GUIDANCE PAGE

6.(a) RADIOACTIVE MATERIAL (Element and mass number of each)

(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH FORM THAT YOU WILL POSSESS AT ANY ONE TIME (If sealed source(s), also state the manufacturer, model number and number of sources)

7. DESCRIBE THE PURPOSE FOR WHICH RADIOACTIVE MATERIAL WILL BE USED. (If radioactive material is for "human use," then Supplement A (Preceptor Statement) MUST be completed in addition to this item).

8. TRAINING OF EACH INDIVIDUAL NAMED IN ITEM 4.

9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)

10. RADIATION DETECTION INSTRUMENTS AVAILABLE FOR USE.

11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN ITEM 10.

12. FILM BADGES, TLD's, DOSIMETERS, AND BIOASSAY PROCEDURES USED

13. FACILTIES AND EQUIPMENT

14. RADIATION PROTECTION PROGRAM

15. WASTE DISPOSAL

CERTIFICATION (MUST be completed by the applicant. See licensing guide for detailed instructions)

16. **The applicant and any official executing this certificate on behalf of the applicant named in Item 1, certify that all information contained herein, including any supplements attached hereto, has been prepared in conformity with all applicable North Carolina Laws and Regulations and is true and correct to the best of our knowledge and belief.**

BY: John A. Doe Sr.
Signature of Certifying Official

May 5, 2004
Date Signed

John A. Doe, Sr., President
Printed Name and Title of Certifying Official

Revised February, 2004

ATTACHMENT TO APPLICATION FOR RENEWAL OF RADIOACTIVE MATERIAL LICENSE NO. 099-9999-9

4. Users of Radioactive Material
John A. Doe, Jr. see attached training certificate
Jane Doe see attached training certificate
Daniel Doe see attached training certificates

6A.	RADIOACTIVE MATERIAL	6B.	CHEMICAL AND/OR PHYSICAL FORM
A.	Cesium-137	A.	Sealed Source. No single source to exceed *X* millicuries
B.	Americium-241:Beryllium	B.	Sealed Source. No single source to exceed *Y* millicuries

7. USE OF RADIOACTIVE MATERIAL
A&B. To be used in a XYZ Company Model *XXXXX* portable moisture/density gauge for determining the properties of construction materials.

8. The RSO will ensure that all users will: (1) be employees of the company, (2) have completed the manufacturer's training course, (3) have been instructed in the ABC Company's operating and emergency procedures, and (4) be designated in writing by the Radiation Safety Officer prior to using the gauge(s). The RSO will also ensure that records of training for authorized users will be maintained on file for a minimum of three (3) years after the employee leaves the company.

9. EXPERIENCE WITH RADIATION

John T. Doe, Jr.:	Manufacturer's training course July,1995
	Field use of nuclear density gauges August 1995 – present
Jane Doe:	Manufacturer's training course January 1996
	Field use of nuclear density gauges February 1996 - present
Daniel Doe:	Manufacturer's training course: January, 1997
	Manufacturer's RSO course, January 1996
	Field use of nuclear density gauges February 1997 – present.

10 & 11. ABC Company does not possess radiation survey instrumentation

or

The ABC Paving Company possesses a [*make, model*] radiation survey instrument for use when performing maintenance on the gauges. We will calibrate the survey instrument on an annual basis using a licensed calibration facility.

12. {Indicate which type of personnel dosimetry will be used, TLD, OSL, etc.} will be issued to all personnel who use, transport, or perform maintenance on the gauge(s) and will be exchanged {*indicate whether monthly or quarterly*} The supplier is {*insert vendor name here*} and their NVLAP certification is enclosed.

13. See attached sketch of storage facility.

14. Radiation Protection Program: [*Use the information in this licensing guide for the areas which MUST be covered, at a minimum, for the radiation protection program.*]

15. ABC Company 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 manufacturer, or (3) transfer the gauge to a licensed disposal facility

APPENDIX B: MINIMUM QUALIFICATIONS FOR AUTHORIZED USERS AND FOR RADIATION SAFETY OFFICERS

- MINIMUM QUALIFICATIONS FOR A **RADIATION SAFETY OFFICER**

  1. Successful completion of a manufacturer's training course in the use of portable nuclear gauge use; **AND**

  2. Use of the device for one year; **OR**

  3. Successful completion of a manufacturer's user training course and a manufacturer's course specifically for Radiation Safety Officers.

- MINIMUM QUALIFICATIONS FOR **AUTHORIZED USER** FOR PORTABLE NUCLEAR GAUGE

  1. Successful completion of the manufacturer's training course in the use of portable nuclear gauge use;

  2. Documentation of review of the company's operating and emergency procedures;

  3. Documentation that the Radiation Safety Officer has authorized the individual to use portable nuclear gauges.

APPENDIX C: DUTIES AND RESPONSIBILITIES OF THE RADIATION SAFETY OFFICER

In addition to the training requirements in Appendix B, the following are the duties and responsibilities of the radiation safety officer (RSO). The person named in item 5 of the application form as the radiation safety officer must be willing and able to perform and execute these duties and responsibilities.

1. Stops licensed activities that the RSO considers unsafe.

2. Ensures that possession, use, storage, and maintenance of sources and gauges are consistent with the conditions of the license, the Sealed Source and Device Registration Sheet(s) and the manufacturer's recommendations and instructions.

3. Ensures that individuals using gauges are properly trained.

4. Ensures that personnel monitoring devices are used and exchanged at the proper intervals, that records of the results of such monitoring are reviewed on a quarterly basis, and records are maintained in accordance with the license conditions and the N.C. Regulations for Protection Against Radiation.

5. Ensures that the gauges are secured properly in storage and in transport.

6. Notifies the proper authorities in case of an accident, damage to the gauge(s), fire, or theft.

7. Ensures that unusual occurrences involving the gauge (e.g. accident, damage) are investigated, cause(s) determined and appropriate corrective actions identified and implemented.

8. Performs audits at least annually and document findings, including any corrective actions taken as a result of problem areas identified during the audit.

9. Ensures that licensed radioactive material is transported in accordance with all applicable D.O.T. regulations and license conditions.

10. Ensures that licensed radioactive material is disposed of properly.

11. Maintains appropriate records of the radiation protection program and make those records available for review during agency inspections. This includes records of leak tests, inventories, use logs, program reviews, personnel monitoring results, receipt and disposal records, etc.

APPENDIX D: GENERAL TRANSPORTATION INFORMATION and DOCUMENTS.

Sample Shipping Paper (Bill of Lading)

Shipper: The ABC Paving Company, Inc.
123 Any Street
Anytown, NC 12345-6789

❷

❶

RQ, RADIOACTIVE MATERIAL, TYPE "A" PACKAGE, SPECIAL FORM, 7, UN3332,

❸

Cs-137 0.3 GBq (8 mCi)
Am-241:Be 1.48 GBq (40 mCi)

❹

RADIOACTIVE YELLOW II LABEL, TI = X.X

❺

****EMERGENCY CONTACT (XXX) XXX-XXXX****

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SHIPPER_____
(Signature)

NOTES:

❶ The "RQ" designation MUST appear either at the BEGINNING or at the END OF the proper shipping name.
❷ Verify that the UN number on the GAUGE CASE matches the UN number on t he SHIPPING PAPER.
❸ The TI can be obtained from either the documentation that comes with the gauge or by contacting the manufacturer.
❹ The emergency contact number must be answered by a knowledgeable individual 24 hours a day whenever the gauge is in transit.
❺ IF you are acting as a private carrier, then this statement DOES NOT have to appear on the shipping document and the document DOES NOT have to be signed.

In addition to all of the information noted above, the D.O.T. regulations require that the shipping paper be dated. An exemption to this regulation was issued to allow private carriers who transport Class 7 (radioactive) materials such as portable nuclear gauges to and from jobsites. This exemption DOES NOT require that the date the radioactive material was put into transport be noted on the shipping paper (Bill of Lading) AS LONG AS THIS INFORMATION IS NOTED ELSEWHERE. This is one of the reasons the agency requires you to maintain a UTILIZATION LOG.

D.O.T. regulations also require that a copy of the shipping paper be maintained for 375 days after the shipment is completed. The same type of exemption as noted above applies to private carriers who transport radioactive materials to and from temporary jobsites. Licensees who transport nuclear gauges MUST maintain a single copy of the shipping paper and a log with the following information:
(1) Proper Shipping Name [i.e., Radioactive Material, Special Form…];
(2) Identification Number [UN 3332]
(3) Quantity of radioactive material in the shipment [i.e., 44 millicuries]; AND
(4) Date of Shipment [as noted above]

Licensees could modify the utilization log to track ALL of this information on ONE FORM! See the example on the next page.

UTILIZATION LOG

XYZ Company Model 9999, Serial No. 167986458-99

RQ, Radioactive Material, Type "A" Package, Special Form, 7, UN3332
Cs-137 *xx* GBq (*xx* mCi)
Am-241:Be *yy* GBq (*yy* mCi)

Date Out	Authorized User	Jobsite/Destination	Date Returned	Authorized User
06/05/2004	Daniel Doe	QRS Company, Hwy 334 North	06/05/2004	Daniel Doe

Maximum Number of Packages and Minimum distances between individuals and packages.

The information in this table is derived from 49 CFR 177.842 "Class 7 (radioactive) material" In addition to the distance limitations, this regulation limits the total number of packages that can be in any vehicle at one time. The limit is based on the sum of the transport indices and cannot exceed 50.

For example, your company owns three (3) gauges. The TI of the gauges are: 0.3, 0.7, and 0.5. The sum would be 1.5. Find this number in the left column and determine the maximum distance the packages need to be from the driver or other occupant, WHOMEVER IS CLOSER TO THE PACKAGES. The result would be that the gauges had to be at least 0.3 meters (1 foot) from the nearest occupant of the vehicle. Users of portable nuclear gauges would rarely transport enough gauges at one time to exceed a total transport index of 10.

Total Transport Index	**Minimum distance in feet (meters)**
0.1 to 1.0	0 (0)
1.1 to 5.0	1 (0.3)
5.1 to 10.0	2 (0.6)
10.1 to 20.0	3 (0.9)
20.1 to 30.0	4 (1.2)

Emergency Response Information

Subpart G of 49 CFR 172 states all of the required information regarding emergency response information. This Subpart of the D.O.T. regulations is VERY specific in what is required. The information required by the D.O.T. has been summarized in the Emergency Response Guidebook. We have adopted the information in this guidebook and provided it as part of this licensing guidance document. This two page form is also available for downloading on our website as well.

Security Awareness Training

Subpart H of 49 CFR 172 states that effective March 25, 2003 security awareness training is required for all HazMat employees. For existing employees, the training must be completed at the next recurrent training session or absolutely no later than March 25, 2006. For new employees, the training must be completed within 90 days of employment.

What is "Awareness Training"?
49 CFR 172.704(a)(4) states "*…provides an awareness of the security risks associated with hazardous materials transportation and methods designed to enhance transportation security. This training must also include a component covering how to recognize and respond to possible security threats."*

The licensee can develop their own security awareness training program, attend other training programs offered by manufacturer's and/or consultants, or use the computer-based training program offered by U.S. Dept. of Transportation. Once the training for HazMat employees has been completed, it is the responsibility of the EMPLOYER (in this case, the licensee) to document that the training has been given and that the HazMat Employee can perform all of his/her duties appropriately. The DOT has published a "FAQ" on training. Click on the address to view the FAQ: http://hazmat.dot.gov/pubtrain/trainreq.htm

RADIOACTIVE MATERIALS (SPECIAL FORM / LOW TO HIGH LEVEL EXTERNAL RADIATION)

POTENTIAL HAZARDS

HEALTH

- Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases.
- Undamaged packages are safe; contents of damaged packages may cause external radiation exposure, and much higher external exposure if contents (source capsules) are released.
- Contamination and internal radiation hazards are not expected, but not impossible
- Type A packages (cartons, boxes, drums, articles, etc.) identified as "Type A" by marking on packages or by shipping papers contain non-life endangering amounts. Radioactive sources may be released if "Type A" packages are damaged in moderately severe accidents.
- Type B packages, and the rarely occurring Type C packages (large and small, usually metal) contain the most hazardous amounts. They can be identified by package markings or by shipping papers. Life threatening conditions may exist only if contents are released or package shielding fails.
- Radioactive white-I labels indicate radiation levels outside single, isolated, undamaged packages are very low (less than 0.005 mSv/h (0.5 mrem/h)).
- Radioactive Yellow-II and Yellow-III labeled packages have higher radiation levels. The transport index (TI) on the label identifies the maximum radiation level in mrem/h one meter from a single, isolated, undamaged package.
- Radiation from the package contents, usually in durable metal capsules, can be detected by most radiation instruments.

Water from cargo fire control is not expected to cause pollution.

FIRE OR EXPLOSION

- Packagings can burn completely without risk of content loss from sealed source capsule
- Radioactivity does not change flammability or other properties of materials.
- Radioactive source capsules and Type B packages are designed and evaluated to withstand total engulfment in flames at temperatures of 800° C (1475° F)

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on next page.**
- **Priorities for rescue, life-saving, first aid, and control of fire and other hazards are higher than the priority for measuring radiation levels.**
- Radiation Authority must be notified of accident conditions. Radiation Authority is usually responsible for decisions about radiological consequences and closure of emergencies
- Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions.
- Stay upwind
- Keep unauthorized personnel away
- Delay final cleanup until instructions or advice is received from Radiation Authority

PROTECTIVE CLOTHING

- Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' clothing will provide adequate protection against internal radiation exposure, but not external radiation exposure

EVACUATION

Large Spill

- Consider initial downwind evacuation for at least 100 meters (330 feet)

Fire

- When a large quantity of this material is involved in a major fire, consider an initial evacuation distance of 300 meters (1000 feet) in all directions.

FIRE

- Presence of radioactive material will not influence the fire control processes and should not influence selection of techniques.
- Move containers from fire area if you can do without risk
- Do not move damaged packages; move undamaged packages out of fire zone

Small Fires

- Dry chemical, CO_2, water spray or regular foam.

Large Fires

- Water spray, fog (flooding amounts).

SPILL OR LEAK

- Do not touch damaged packages or spilled material.
- Damp surfaces on undamaged for slightly damaged packages are seldom an indication of package failure. Contents are seldom liquid. Content is usually a metal capsule, easily seen if released from package.
- If source capsule is identified as being out of package, **DO NOT TOUCH**. Stay away and await advice from Radiation Authority.

FIRST AID

- Medical problems take priority over radiological concerns.
- Use first aid treatment according to the nature of the injury.
- Do not delay care and transport of a seriously injured persons.
- Persons exposed to special form sources are not likely to be contaminated with radioactive material.
- Apply artificial respiration if victim is not breathing
- Administer oxygen if breathing is difficult.
- Injured persons contaminated by contract with released material are not a serious hazard to health care personnel, equipment or facilities.
- Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

UNITED STATES

1. CHEMTREC®

1-800-424-9300
(Toll Free is U.S., Canada, and the U.S. Virgin Islands)
703-527-3887 For Calls originating elsewhere
(Collect calls are accepted)

3. INFOTRAC

1-800-535-5053
(Toll Free is U.S., Canada, and the U.S. Virgin Islands)
352-323-3500 For Calls originating elsewhere
(Collect calls are accepted)

5. **MILITARY SHIPMENTS**

703-697-0218 – Explosives/ammunition incidents
(collect calls are accepted)

1-800-851-8061 – All other dangerous goods incidents

2. CHEM-TEL, INC.

1-800-255-3924
(Toll Free is U.S., Canada, and the U.S. Virgin Islands)
813-248-0585 For Calls originating elsewhere
(Collect calls are accepted)

4. 3E COMPANY

1-800-451-8346
(Toll Free is U.S., Canada, and the U.S. Virgin Islands)
760-602-8703 For Calls originating elsewhere
(Collect calls are accepted)

APPENDIX E: MODEL ANNUAL RADIATION PROTECTION PROGRAM REVIEW

Licensee Name: _____ Date of Audit _____

License No.: _____ Auditor _____

Telephone No.: _____

Signature of auditor _____

1. AUDIT HISTORY
   - A. Last audit of this location conducted on (date)
   - B. Were previous audits conducted yearly? [15A NCAC 11 .1603]
   - C. Were records of previous audits maintained? [15A NCAC 11 .1636]
   - D. Were any deficiencies identified during the last two audits or two years, whichever is longer?

2. ORGANIZATION AND SCOPE OF PROGRAM
   - A. If the physical or mailing address has changed, was the license amended?
   - B. If ownership changed or bankruptcy filed, was the N.C. Radiation Protection Section notified prior to this occurrence?
   - C. If the RSO changed, was the license amended? Does the new RSO meet agency training requirements?
   - D. Does the license authorize the possession and use of all radioactive material contained in the gauges possessed by the company?
   - E. Does the licensee possess all of the manufacturer's manuals for operation and maintenance?
   - F. Are the actual uses of the gauges consistent with the authorized uses listed on the license?
   - G. Is the RSO fulfilling his/her duties?

3. TRAINING AND INSTRUCTION TO WORKERS
   - A. Were all workers who are likely to exceed 100 millirem per year instructed per 15A NCAC 11 .1003?
   - B. Did each gauge operator attend an approved course prior to using the gauge?
   - C. Are training records available for each gauge operator?
   - D. Does the training record include the written approval of the RSO authorizing the user
   - E. Did this audit include observations of operators using the gauge in a field situation?
   - F. Does each user have HAZMAT training as required under Subpart H, 49 CFR 172?
   - G. Does each user have security awareness training as required under Subpart H, 49 CFR 172?

4. RADIATION SURVEY INSTRUMENTS
   - A. If the licensee owns a survey instrument, is it appropriate for the type of radiation used under this license?
   - B. If the licensee does not own a survey instrument, are there plans to purchase one?
   - C. Is the survey meter used for non-routine maintenance procedures?
   - D. Are calibration records for the survey instrument available?

5. GAUGE INVENTORY
   - A. Does the licensee have a record of receipt for EACH gauge possessed under the license?
   - B. Are all gauges inventoried at least every six (6) months?
   - C. Do the records of the physical inventories contain the information specified by license condition or regulation?

6. PERSONNEL RADIATION PROTECTION
   - A. Are ALARA considerations incorporated into the radiation protection program per 15A NCAC 11 .1603(b)?
   - B. Personnel monitoring:
     1. Is the dosimetry supplier NVLAP approved? [15A NCAC 11 .1613(c)]

2. Are badges exchanged at the appropriate frequency (monthly for film badges, monthly or quarterly for TLD's)?
3. Are the reports reviewed by the RSO when they are received?
4. Is the licensee maintaining records of personnel dosimetry in accordance with 15A NCAC 11 .1640?
5. If a worker has declared her pregnancy, did the licensee comply with 15A NCAC 11 .1610?
6. Were all radiation exposures reviewed ALARA?

7. DOSE TO MEMBERS OF THE GENERAL PUBLIC
   A. Are the gauges stored in a manner to keep doses below 100 mrem per year and ALARA?
   B. Has a survey or evaluation been performed per 15A NCAC 11 .1611?
   C. Have there been any changes in the storage location, security of the gauges, or use of surrounding areas which would necessitate a new survey or evaluation?
   D. Do any unrestricted areas have radiation levels which exceed 2 mrem in any one hour?
   E. Are the gauges stored in a manner which would prevent unauthorized use or removal of the gauges?
   F. Are records maintained in accordance with 15A NCAC 11 .1641?

8. OPERATING AND EMERGENCY PROCEDUES
   A. Have operating and emergency procedures been developed?
   B. Do the procedures cover the scope and implementation of licensed activities?
   C. Does each operator have a current copy of the operating and emergency procedures?
   D. Did any emergencies occur? If so, summarize each incident and determine whether the operator handled the situation appropriately and that appropriate corrective actions have been taken.

9. LEAK TESTS
   A. Was each sealed source leak tested at six month intervals or at the interval specified by license condition?
   B. Was the leak test performed in accordance with the statements and representations in the license application and/or the procedure stated in the manufacturer's operating procedures?
   C. Are records of leak tests retained with the appropriate information included?
   D. Were any sources found to be leaking? If yes, was the agency notified?

10. MAINTENANCE OF GAUGES
   A. Are the manufacturer's procedures followed for all routine cleaning and lubrication of the gauge?
   B. Do all personnel who perform the routing cleaning and lubricating of the gauge wear personnel dosimetry when performing the procedures?
   C. Is any non-routine maintenance performed on the gauge? If so, are the procedures approved in the license application followed?

11. TRANSPORTATION
   A. DOT – 7A or other authorized packages used? [49 CFR 173.415, 49 CFR 173.416(b)]
   B. Package performance tests on file?
   C. Special form certificates on file
   D. Each package has two (2) labels on opposing sides (e.g. Yellow II) with Transport Index (TI), Nuclide, Activity, RQ designation (if applicable) and Hazard Class?[49 CFR 172.403, 49 CFR 173.441]
   E. Package properly marked ? [49 CFR 172.301, 49 CFR 172.304, 49 CFR 172.310, 49 CFR 172.324]
   F. Package closed and sealed during transport? [49 CFR 173.475(f)]
   G. Shipping papers prepared properly and used? [49 CFR 172.200(a)]
   H. Shipping papers contain the proper information {shipping name, hazard class, identification number (UN Number), total quantity, package type, nuclide, RQ (if applicable), radioactive material, physical and chemical form, activity, category of label, TI, shipper's name, certification and signature, emergency response phone number, cargo aircraft only (if applicable)} [49 CFR 172.201, 202, 203, 204, 49 CFR 172.604]
   I. Shipping papers maintained within easy reach of driver (i.e. on front seat beside driver)?
   J. Was the transport case secured against movement?
   K. Were placards used properly (if applicable)?

L. Were proper overpacks used (if applicable)?
M. Were any incidents reported to the agency or DOT?

12. AUDITOR'S INDEPENDENT SURVEY MEASUREMENTS (IF MADE)
A. Describe the type, location, and results of measurements. Indicate make, model, and calibration date of instrument used. Do any radiation levels exceed the regulatory limits?

13. NOTIFICATION AND REPORTS
A. Was any radioactive material lost or stolen? If so, were the proper reports made to the agency? [15A NCAC 11 .1645, .1646, .1647]
B. Did any overexposures occur? If so, were the proper reports made to the agency? [15A NCAC 11 .1645, .1646,]
C. If any events in A or B above occurred, what was the root cause of the incidents? Were the corrective actions appropriate?
D. Does the licensee have the telephone for the N.C. Radiation Protection Section (the agency)?

14. POSTING AND LABELING
A. Is the latest revision of the agency form "Notice to Employees" posted? [15A NCAC 11 .1002(c)]
B. Are the license, application, and a copy of the North Carolina Regulations posted and/or available for review? [15A NCAC 11 .1002]
C. Other posting and labeling as described in 15A NCAC 11 .1000?

15. RECORD KEEPING FOR DECOMMISSIONING
A. Are records for the safe and effective decommissioning of the facility maintained per 15A NCAC 11 .0353?

16. MEMORANDA, ETC. FROM THE AGENCY
A. Has the licensee maintained all memoranda, etc from the agency?
B. Has the licensee implemented appropriate actions in response to the memoranda?

17. SPECIAL LICENSE CONDITIONS OR ISSUES
A. Did the auditor review special license conditions or other issues (e.g. non-routine maintenance)?

18. DEFICIENCIES IDENTIFIED IN AUDIT; CORRECTIVE ACTIONS
A. Summarize any problems/deficiencies identified during this audit.
B. If problems were identified during this audit, describe corrective actions planned or taken. Are corrective actions planned or being implemented at ALL licensed locations (not just location audited)?
C. Provide any recommendations for improvement.

19. EVALUATION OF OTHER FACTORS
A. Senior licensee management is appropriately involved with the radiation protection program and/or the Radiation Safety Officer (RSO) oversight of the program?
B. RSO has sufficient time to perform his/her radiation safety duties?
C. Licensee has sufficient staff to support the radiation protection program?

Date submitted to Management _____ Date of Management Review _____

Management signature: _____

APPENDIX F: EXAMPLE PORTABLE NUCLEAR GAUGE LICENSE

RADIOACTIVE MATERIALS BRANCH
RADIATION PROTECTION SECTION
N. C. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RADIOACTIVE MATERIALS LICENSE

Pursuant to North Carolina Regulations for Protection Against Radiation and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer, and import radioactive materials listed below; and use such radioactive material for the purpose(s) and at the place(s) designated below. This License is subject to all applicable rules and regulations of the North Carolina Department of Environment and Natural Resources now and hereafter in effect and to any conditions specified below.

1.	**Licensee Name:**	The ABC Paving Company, Inc.	**3.** **License No:**	999-9999-9	**License Type 0300**
2a.	**Mailing Address:**	123 Any Street Anytown, NC 12345-6789	**4.** **Expiration Date:**	**June 31, 2009**	
b.	**Physical Address:**	123 Any Street Anytown, NC 12345-6789		**New License** / **Renewal** (X) / **Routine** / **Administrative** / **Corrected Copy** / **Termination**	
c.	**Radiation Safety Officer:**	Daniel S. Doe	**5.a.** **Amendment No.:**	**456**	
			b. **Issuance Date:**	**May 5, 2004**	

6.	**Radioactive Material (element and mass no.)**	**7.**	**Chemical and/or Physical Form**	**8.**	**Maximum Amount of Radioactivity and/or Quantity of Radioactive Material which Licensee May Possess at Any One Time.**
A.	Cesium 137	A.	Sealed Sources	A.	No single source to exceed XX millicuries
B.	Americium 241:Beryllium	B.	Sealed Sources	B.	No single source to exceed XX millicuries

9. **Authorized Use:**

A. & B. To be used in a XYZ Company Model XXX portable gauging device for determining the properties of construction materials.

CONDITIONS

10. A. The authorized place of receipt and storage of radioactive material is the licensee's address stated in item 2b. above

B. Radioactive materials may be used at temporary jobsites of the licensee throughout the State of North Carolina in areas not under exclusive Federal jurisdiction (Federal installations such as military bases, V.A. Hospitals, etc.). Authorization for the use of radioactive materials at temporary jobsites under exclusive Federal Jurisdiction shall be obtained either by (1) filing a NRC Form 241 [10 CFR 150.20(b)], or (2) applying for reciprocity, or (3) applying for a specific license from the NRC if the length of the job is to exceed six (6) months.

C. This condition does not prohibit the use of radioactive materials in other states; however, before radioactive materials can be used at a temporary jobsite in another state, authorization must be obtained from the State, if it is an Agreement state, or from the Nuclear Regulatory Commission for any non-Agreement State, either by filing for reciprocity or applying for a specific license.

11. The licensee shall comply with the provisions of 15A NCAC 11 .1600 "Standards for Protection Against Radiation," and 15A NCAC 11 .1000 "Notices, Instructions, Reports and Inspections." (The North Carolina Regulations for Protection Against Radiation are contained in 15A NCAC 11.)

RADIOACTIVE MATERIALS BRANCH
RADIATION PROTECTION SECTION
N. C. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RADIOACTIVE MATERIALS LICENSE

CONDITIONS (continued):

12. A. Licensed material shall only be used by Daniel S. Doe, or individuals who (1) are employees of the licensee, (2) have successfully completed a manufacturers training program for gauge users, (3) have been instructed in the licensee's routine operating and emergency procedures and (4) have been designated in writing as having completed these requirements by the Radiation Safety Officer.

    B. Records of these designations shall be maintained for three (3) years after the company no longer employs the individual.

    C. The licensee shall establish a method of identification and documentation of training for the persons authorized in Condition A above. This shall be made available for review by the agency at the time of either a field or home office inspection.

    D. The Radiation Safety Officer for the activities authorized under this license shall be Daniel S. Doe

13. A. Each sealed source containing radioactive material shall be tested for leakage and/or contamination at intervals not to exceed six (6) months. In the absence of a certificate from the transferor indicating that a test has been made within six (6) months prior to the transfer, the sealed source shall not be put into use until tested.

    B. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the agency.

    C. If the test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall immediately withdraw the sealed source from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with agency regulations. A report shall be filed within five (5) days of the test with the Radioactive Materials Branch, Radiation Protection Section, Department of Environment and Natural Resources, 1645 Mail Service Center, Raleigh, NC 27699-1645, describing the equipment involved, the test results, and the corrective action taken.

    D. Tests for leakage and /or contamination shall be performed by persons specifically authorized by the agency to perform such services.

14. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provision of Section 71.5, Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For Transport."

15. Sealed sources containing radioactive material shall not be opened or removed from their respective source holders by the licensee.

16. Gauges that are equipped with a sliding block which require servicing shall be cleaned and lubricated only by personnel who are authorized in the license to use the gauge and who have received training on how to remove, clean and lubricate the sliding block properly. The sliding block may be removed provided:

    A. Personnel removing the sliding block wear appropriate personnel monitoring equipment; and

    B. Personnel removing the sliding block stay on the opposite side of the gauge from the sliding block and use a mirror to view the removal and reinstallation of the sliding block in order to minimize exposure.

17. The radioactive source rod containing radioactive material which requires servicing may be removed from the gauge for cleaning and lubrication only in accordance with procedures contained in the gauge manual and only by persons who are authorized in the license to use the gauge and who have received training on how to remove, clean, and lubricate the source rod properly. The source rod may be removed provided:

RADIOACTIVE MATERIALS BRANCH
RADIATION PROTECTION SECTION
N. C. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RADIOACTIVE MATERIALS LICENSE

CONDITIONS (continued):

17. A. Personnel removing the source rod wear appropriate personnel monitoring equipment;

B. The source rod is removed while in an appropriate area away from other people;

C. After the source rod is cleaned and lubricated, a calibration check is made to confirm the source rod is in the proper location and instrument readings are normal;

D. Records show the location, date, and name of the person performing the cleaning, lubrication, and calibration check; and

E. The above records are maintained for a period of three (3) years or until the agency authorizes their disposal.

18. The licensee shall keep records for each device authorized in this license showing which authorized user has the device, the time and date the device was removed from storage, job where device was used and the time and date the device was placed back into storage. Records of use shall be kept for two (2) years for inspection by the agency or until they have been reviewed by the agency and if the records are determined to be satisfactory, then they may be disposed of.

19. The licensee shall conduct a physical inventory of all sealed sources received and possessed under this license at intervals not to exceed six (6) months. Records of the inventories shall be maintained for inspection by the agency and shall include the quantities and kinds of radioactive material, location of sources and the date of the inventory.

20. In addition to the possession limits in Item 8 above, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 15A NCAC 11 .1353 for establishing decommissioning financial assurance.

21. The licensee shall annually review its Radiation Protection Program for content and implementation [Reference 15A NCAC 11 .1603(c)]. Documentation of the Radiation Protection Program reviews shall be retained for inspection by the agency [Reference: 15A NCAC 11 .1636].

22. The licensee shall institute the provisions of 15A NCAC 11 .1610 when an occupationally exposed woman voluntarily informs her supervisor, in writing, of the pregnancy and the estimated date of conception.

23. The licensee shall ensure that no individual "member of the public" [Reference: 15A NCAC 11 .0104(64)] receives a radiation dose in excess of the limits specified in 15A NCAC 11 .1611(a) while conducting licensed activities.

24. This license may be subject to amendment, revision, modification, suspension, or revocation in accordance with the provisions of 15A NCAC 11 .0344.

25. Except as specifically provided otherwise by this license, the licensee shall possess and use radioactive material described in Items 6., 7., and 8. of this license in accordance with statements, representations and procedures and attachments listed below. The North Carolina Regulations for Protection Against Radiation shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Application with attachments dated May 1, 2004, signed by John A. Doe, Sr., President.

For: Beverly O. Hall
Chief, Radiation Protection Section

APPENDIX G: GUIDANCE ON DEMONSTRATING COMPLIANCE WITH 15A NCAC 11 .1611, DOSE TO MEMBERS OF THE PUBLIC

15A NCAC 11 .1611 defines the dose limits to an individual member of the public. A member of the public is defined as "*any individual except when that individual is receiving an occupational dose.*" [reference 15A NCAC 11 .0104(69)]. The dose limits for the member of the public are:

100 millirem (mrem) in **ONE YEAR**

or

2 mrem in **ANY ONE HOUR**

Some licensee demonstrate compliance with this regulation by performing exposure rate surveys with a calibrated radiation detection instrument. This provides a dose rate (but not total dose) in the area of interest. To assess the dose in any area of interest, licensees may choose to use "area monitors." These monitors are placed in the areas of interest and are then processed by the dosimetry company. This provides a permanent record of the dose (not dose rate) in the area of interest

Another method of demonstrating compliance with the dose to members of the public is by calculation. This approach is the focus of this appendix. The guidance is divided into two sections for ease of use. The first section deals with demonstrating compliance with the ANNUAL dose limit of 100 mrem. The second deals with demonstrating compliance with the ONE HOUR DOSE RATE limit of 2 mrem.

The total dose and dose rate calculated using this worksheet are CONSERVATIVE. By that, we mean that the numbers derived from this worksheet represent the maximum dose (or dose rate) based on the number of gauges you possess. The actual dose (or dose rate) will be less than the calculated dose rate. By using a conservative approach, we can better meet the intent of ALARA.

Read and familiarize yourself with the worksheet prior to entering the data. You will need to gather the following information before beginning:

1. total number of nuclear gauges;
2. the dose received in one hour at a known distance from the gauge. (This can be located in the Sealed Sources and Devices Registration Sheet or obtained from the manufacturer);
3. the DISTANCE from the storage location to the nearest individual (or workstation);
4. the total time an individual spends at the workstation.

After completing SECTIONS I and II, if the dose (SECTION I) and dose rate (SECTION II) calculations demonstrate compliance, you may stop using the worksheet and record the results. Maintain the results for inspection

SECTION I
DETERMINING COMPLIANCE FOR THE ANNUAL DOSE TO NEAREST MEMBER OF THE PUBLIC

STEP	INSTRUCTIONS	INPUT	RESULT
1.	Identify the individual (or workstation) which is nearest to the proposed gauge storage location.		
2.	**SUM** of the Transport Index (TI) for ALL gauges		
3.	Determine the **DISTANCE** from the gauge storage location to the nearest worker or workstation		
4.	**SQUARE** the distance in **STEP 3**. [e.g. $(10 \text{ ft.})^2$]		
5.	**DIVIDE** the result of **STEP 4** by "9"		
6.	**DIVIDE** the result of **STEP 2** by the result of **STEP 5**		
7.	Enter the number of hours that the individual identified in **STEP 1** will spend at the location. *[NOTE: Full time employment usually means 8 hours/day, 5 days/week, 50 weeks/year for a total of 2000 hours per year.]*		
8.	**MULTIPLY** the result of **STEP 6** by the result of **STEP 7.** This is the maximum number of millirem (DOSE) that the individual will receive while working at this location.		
	Is the RESULT of **STEP 9** is **LESS THAN** 100 mrem? ☐ YES ⟶ Proceed to SECTION II ☐ NO ⟶ GO TO SECTION III		

Calculations performed by:		Date Performed:	

NOTES and/or COMMENTS

SECTION II
DETERMINING COMPLIANCE FOR DOSE RATE TO NEAREST MEMBER OF THE PUBLIC

STEP	INSTRUCTIONS	INPUT	RESULT
1.	Determine the **DISTANCE** from the gauge storage area to any unrestricted area.		
2.	**SQUARE** the distance in **STEP 1**. [e.g. $(10 \text{ ft.})^2$]		
3.	**DIVIDE** the result of **STEP 2** by "9"		
4.	Enter the result from ***Section I, STEP 2***		
5.	**DIVIDE** the result of **STEP 4** by the result of **STEP 3**		

6. Is the RESULT of STEP 4 is LESS THAN 2 mrem/hr?
   - ☐ YES → STOP, date and sign the report.
   - ☐ NO → GO TO SECTION III

Calculations performed by:		Date Performed:	

NOTES and/or COMMENTS

Please note that this calculation needs to be reviewed AT LEAST ANNUALLY (for the annual program review) and repeated whenever NEW GAUGES are added to the inventory.

SECTION III
WHAT TO DO IF CALCULATED VALUES EXCEED REGULATORY LIMITS?

A. Limit the **TIME** the individual(s) spend in the area near the nuclear gauges.

B. Increase the **DISTANCE** from the storage location to the workstation. This may be accomplished by moving either the storage location or the workstation.

C. Increase the **SHIELDING** around the storage areas, reducing the exposure rate and total dose to the member of the public.

If you increase the **DISTANCE** from the gauges to the nearest workstation, simply input the new distance figures into Sections I and II above and re-calculate. If you are still over EITHER of the limits, then additional steps will be necessary to control the dose to the general public.

If shielding is added, the table below lists "Half-Value Layers" for the type of radiation emitted. A Half-Value Layer is defined as the thickness of material which will reduce the dose rate to ONE HALF the ORIGINAL RATE. For example, ¼ inch of lead will reduce the dose rate from a ^{137}Cs source from 10 mrem/hr to 5 mrem/hr. To achieve the same results with concrete, use 2 inches.

Material	**Gamma Radiation (from ^{137}Cs)**	**Neutron Radiation (from ^{241}Am:Be)**
Lead	¼ inch	Not applicable
Concrete	2 inches	4 inches

APPENDIX H: CONSIDERATIONS FOR EXCEPTED PACKAGES – ARTICLES AND INSTRUMENTS

Certain devices containing radioactive material in special form will be "excepted" from some of the transportation requirements in the Department of Transportation (DOT) regulations [49 CFR Parts 100 – 185]. The manufacturer and/or distributor of the device will be able to tell you if their particular combination of instrument and package meet the requirements. The DOT regulations have 8 "tests" that the package must pass before the exception can be allowed. Again, the Manufacturer/Distributor will have this information available.

NOTE: ***It is NOT the responsibility of the APPLICANT to determine if the package is excepted from DOT Regulations. This will be done by the Manufacturer/Distributor of the device. The information given here is for educational purposes only and should not be interpreted as an agency requirement to evaluate a package for compliance with DOT Regulations.***

IF the device is excepted, then the licensee is relieved from certain marking, labeling and bill of lading requirements. **IF** the instrument meets these requirements, then the statement required by 49 CFR 173.422 is the only "paperwork" requirement that must be followed. The statement listed below **MUST** accompany the package.

"This package conforms to the conditions and limitations specified in 49 CFR 173.424 for radioactive material, excepted package – instruments and articles, UN2910"

Normally the distributor will provide this statement on a separate sheet (probably with the distributor's contact information). The statement may be on the outside of the package (like a sticker), placed inside the package, included with the packing list, or otherwise forwarded with the package. Because the different distributors have different methods for formatting this statement, no specific example has been included with this licensing guidance.

Remember, IT IS THE RESPONSIBILITY OF THE DISTRIBUTOR TO DETERMINE IF THE PACKAGE MEETS THE EXCEPTIONS FROM DOT REGULATIONS. THEY WILL PROVIDE YOU WITH THE APPROPRIATE MATERIALS.

NOTE: ***The applicant MUST maintain control over the radioactive material while in transport and in use. The applicant IS NOT EXCEPTED from the DOT requirements for "blocking and bracing" [49 CFR 177.834]***