
RADIOACTIVE MATERIALS PROGRAM
INSTALLED GAUGES AND GAS CHROMATOGRAPHY LICENSING GUIDE Revision 4

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I. PURPOSE OF GUIDE

This guide describes the information needed by the Georgia Department of Natural Resources Radioactive Materials Program (Department) to assist applicants and licensees in preparing applications for new licenses, license amendments, and license renewals for the use of sealed sources in installed gauging devices, i.e. gauges mounted in "fixed" locations or gas chromatography (GC) devices. Installed gauges are designed for measurement or control of material density, flow, level, thickness, weight, etc. **If you will be using only GC's, you may follow Appendix I in preparing the license application.**

This regulatory guide is intended to provide you, the applicant or licensee, with information that will enable you to understand specific regulatory requirements and licensing policies as they apply to the specified services that you provide.

After you are issued a license, you must conduct your program in accordance with (1) the statements, representations, and procedures contained in your application, (2) the terms and conditions of the license, and (3) the Department of Natural Resources' regulations.

- Rule 391-3-17-.01** "General Provisions, Amended."
- Rule 391-3-17-.02** "Licensing of Radioactive Materials, Amended."
- Rule 391-3-17-.03** "Standards for Protection Against Radiation, Amended."
- Rule 391-3-17-.06** "Transportation of Radioactive Materials, Amended."
- Rule 391-3-17-.07** "Notices, Instructions and Reports to Workers; Inspections, Amended."

Unless otherwise stated, all regulations cited in this guide are in Chapter 391-3-17, "Rules and Regulations for Radioactive Materials". You may request copies of the above documents from the Department at: Radioactive Materials Program, 4220 International Parkway, Suite 100, Atlanta, Georgia 30354 or from the World Wide Web at <http://www.gaepd.org/Documents/rmprogram1.html>.

Before preparing your application for a license to use radioactive materials, you should be acquainted with the applicable regulations. It is your responsibility as an applicant and as a licensee to have copies of, to read, and to abide by each regulation. The Department will provide one copy of Chapter 391-3-17 for each license issued.

AS LOW AS IS REASONABLY ACHIEVABLE (ALARA) PHILOSOPHY

Georgia Rule 391-3-17-.03(4)(b) states "The licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA)." As an applicant, you must have an ALARA plan that embraces this philosophy when developing plans for working with radioactive materials.

This radiation protection program must be reviewed at least annually for the effectiveness of implementation. Licensees are required to maintain records of their radiation protection program until the Department terminates the pertinent license. Licensees must maintain records of audits and other reviews of program content and implementation for 3 years after the record is made.

II. FILING AN APPLICATION

Complete the form "Application for a Radioactive Materials License"(Appendix A-1). Complete Items 1 through 4 on the form itself. For items 5 through 13 submit the information on supplementary pages. Each separate sheet or document submitted with the application needs to be identified and keyed to the item number on the application to which it refers. All typed pages, sketches, or drawings should be on 8-1/2 x 11 inch paper to facilitate handling and review. Complete all items in enough detail for the Department to determine that your equipment, facilities, training and experience, and radiation protection program are adequate to protect health and to minimize danger to life and property.

PUBLIC AVAILABILITY OF RECORDS

Licensees should remember that all documents submitted to the State of Georgia may be made available to the public.

The Department recommends that the licensee not include in any submittal trade secrets or personal information about your employees, unless the information is directly related to radiation safety or specifically required by the Department. For example (1) information submitted on training and experience of employees should be limited to training related to radiation safety; (2) home addresses and telephone numbers should be submitted only if they are part of the emergency procedures; and (3) dates of birth, social security numbers, and radiation dose information should be submitted only if specifically required by the Department.

If you submit trade secrets, proprietary information, or personnel information that you want withheld from public disclosure, you must request withholding in accordance with procedures specified in the Georgia Open Records Law¹. Failure to follow this procedure may result in disclosure of the information to the public and/or substantial delays in processing your submittals. Using labels such as "confidential" or "restricted" may not guarantee that your documents will be withheld.

III. CONTENTS OF AN APPLICATION

Item 1. License Information

Indicate whether this is an application for a new license, an amendment, or a renewal. If this is an amendment or a renewal, please identify the license number. An amendment request may be submitted in letter form without using the application. For an amendment, the licensee must identify the "GA." license number and give the business name. In all cases, the appropriate license fee must accompany the application in order for the review to begin. (See Item 12 and Fee Schedule, for the correct fee and mailing address)

Item 2.a. Name and Mailing Address of Applicant

Enter the applicant's name, mailing address, county, telephone number, fax number and **Internet address** if applicable. The applicant should be the legal name of the corporation or other legal entity with direct control over the use of the radioactive material. If the applicant is an individual, the individual should be acting in a private capacity and the use of the radioactive material should not be connected to the individual's employment in a corporation or other legal entity.

¹ A copy of the Georgia Open Records Law is available from the Georgia Law Library, for a copy of the law the library may be contacted at (404) 656-3468.

Item 2.b. Street Address(es) of Use

List each permanent facility used as a location of storage and use by the street address, city, and state or other descriptive address (such as on highway 10, two miles east of the intersection of highway 10 and state route 234, Any town, Georgia). The descriptive address should be sufficient to allow a Department inspector to find the location. A post office box is not acceptable for address of use. **The use address must be an in-state address.**

Please identify the geographical location of your facility(s).

Item 3. Person to Contact

Enter the name and telephone number of the individual(s) responsible for this application and license. This individual should be familiar with the proposed radioactive materials program and be able to answer questions about the application. This individual is usually the person responsible for the radiation protection program and will serve as the point of contact during the review of the application and after issuance of the license. Notify the Department if the individual assigned this function changes. Notification of a contact change is **not considered a license amendment** unless the individual is the Radiation Safety Officer.

The individual named in Item 3 may or may not be the individual who signs the application in Item 13. However, any commitments made by the applicant must be signed by the individual named in Item 13. The Department considers that individual to have the authority to make commitments on behalf of the applicant.

Item 4. Record Retention

Indicate where records are to be maintained. If multiple locations are being requested, records for each site's operation must be maintained at that site and at the main Georgia facility location as indicated in Item 2.a. or 2.b. If multiple locations are requested, the record location will be indicated in a condition in the radioactive materials license when it is issued.

Item 5. Radioactive Material

1. Identify each radionuclide, the chemical or physical form, the number of sources, and the maximum activity requested. Specify activity in terms of Curies. For example, the maximum activity per source is 300 millicuries of cesium-137.

NOTE

New requirement Increased Controls:

The U.S. Nuclear Regulatory Commission (NRC) and the Agreement States has implemented increased controls for licensees that possess certain radioactive materials in quantities of concern. NRC has determined that additional requirements need to be implemented to supplement existing regulatory requirements in 10 CFR 20.1801-1802 (rules similar to Rule Chapter 391-3-17-.03(11)(a) and (b)). The increased controls are a matter of compatibility with NRC and must be implemented with essentially identical content to those being used by NRC for its licensees. To determine whether this is applicable to your application, **please refer to Appendix J for a list of radionuclides with Quantities of Concern.**

2. Identify the manufacturer's name and model number of each sealed source that will be used in each gauging device.

3. Identify the manufacturer's name and model number of each gauging device in which the sealed sources will be used.

NOTE: Consult with the proposed supplier for this information to be sure that the sources, devices, and source-device combination(s) conform to the sealed source and device designations registered with the NRC or an Agreement State. Improperly identified equipment may require additional correspondence and may slow the review process.

Item 6. Purposes For Which Licensed Material Will Be Used

Specify the purposes for which the gauging devices you want to possess will be used. For example, an installed gauge is normally used for measuring thickness, density, weight, flow, level, etc. of different materials. In order for gauging devices to be used safely, the device should be used only for the purposes for which the device was designed and in accordance with the manufacturer's recommendations for use.

Item 7. Individual Responsible For Radiation Protection Program And Their Training and Experience

State the name of the person designated by, and responsible to, the applicant's management as Radiation Safety Officer (RSO). This individual is responsible for the management and coordination of the Radiation Protection Program, who maintains the license and associated records, and who, in most instances, is the contact with the Department in administering the license.

The RSO should have a high school diploma or a general equivalency diploma (GED) as well as the training you will require of the gauge users as described in your response to Item 8 below. If the RSO has completed (or will complete) gauge manufacturer's course, submit a copy of the training certificate that shows the title of the course and where and when (specific dates) the course was or will be completed.

If the RSO received training other than that provided by the gauge manufacturer, you should provide the information requested in 1 through 3 under Item 8.2 below with evidence that the RSO successfully completed the course.

The RSO must have independent authority to: maintain an ALARA program, enforce radiation safety polices and procedures, suspend activities deemed unsafe, implement remedial action when necessary, make a decision relative to any and all licensed activities, and if designated as the primary contact with the Department be delegated the authority to act as a duly authorized person on behalf of the applicant.

You should provide management's commitment that the RSO has independent authority to stop unsafe operations and will be given sufficient time to do his or her radiation safety duties and responsibilities.

Provide a copy of an organizational chart that shows the RSO position to demonstrate that the RSO has sufficient independence and direct communication with responsible management officials. The organizational chart should show the position of the individual who signs the application in Item 13 of the Application Form.

The RSO's duties and responsibilities should include those areas listed in Appendix C. In lieu of submitting the requested description, you may state, "The RSO's duties and responsibilities will be those listed in Appendix C of Installed Gauges and Gas Chromatography Licensing Guide".

Item 8. Training Provided To Other Users

Employees who will use the devices under the supervision of a responsible individual named in Item 7 do not need to be designated by name. The information you need to provide is dependent on whether these individuals receive initial training in an installed gauge manufacturer's course or in an alternative training program for gauge users.

8.1 Initial Training Received in a Gauge Manufacturer's Course

If gauge users receive training in a gauge manufacturer's course, you should provide the following:

1. A commitment that, before an individual is permitted to use a gauge, the individual (a) will have successfully completed a gauge manufacturer's course that meets the criteria in Part I of Appendix D of this guide and the course instructor's qualifications meet the criteria in Part II of Appendix D of this guide, (b) will have received copies of, and been trained in, the applicant's operating and emergency procedures, and (c) will have been designated as an authorized user by the RSO.

For each individual trained after you have made the above commitment in an application to the Department, you should maintain records demonstrating that the individual successfully completed a gauge manufacturer's course; that the course meets the criteria in Part I of Appendix D; that the course instructor's qualifications meet the criteria in Part II of Appendix D; that the individual received copies of and was trained in the applicant's operating and emergency procedures; and that the individual was designated as an authorized user by the RSO. These records should be maintained until three years after the individual terminates employment.

2. A commitment that refresher training will be provided, by the RSO or an instructor whose qualifications are those described in Part II of Appendix D of this guide. Indicate the frequency of the refresher training. The refresher training should include participating in "dry runs" of your emergency procedures and reviewing (1) operating and emergency procedures, including lock-out/tag-out procedures as appropriate, (2) changes in applicable regulations or license conditions, and (3) deficiencies identified during the performance of annual audits of the radiation protection program. Refresher training may also include review of applicable Department's Information Notices and Bulletins. Typically, refresher training lasts 2-4 hours; refresher training of shorter duration is acceptable provided it encompasses participation in "dry runs" and review of the items listed above.

You should maintain records of refresher training, including the date of the training, identity of the instructor, list of attendees, and topics covered. These records should be kept for at least 3 years.

8.2 Initial Training Received in an Alternative Course (i.e., Other than a Gauge Manufacturer's Course)

If gauge users receive initial training in an alternative course (i.e., other than a gauge manufacturer's course), you should provide the following.

1. A description of the alternative course, including its duration, the topics covered, the amount of time devoted to each topic;
2. The name and qualifications of each instructor;

3. A description of how the trainees' competency is ensured, including a description of tests to be administered and copies of sample tests with correct answers shown and a notation of the minimum "passing" grade;
4. A commitment that, before an individual is permitted to use a gauge, the individual (a) will have successfully completed the alternative course described in response to 1 through 3 above, (b) will have received copies of and been trained in the applicant's operating and emergency procedures, and (c) will have been designated as an authorized user by the RSO.

For each individual trained by an alternative course, you should maintain records demonstrating that the individual successfully completed the course as described in response to 1 through 3 above; that the course content and instructor qualifications were as described in response to 1 through 3 above; that the individual received copies of, and was trained in, the applicant's operating and emergency procedures; and that the individual was designated as an authorized user by the RSO. These records should be maintained until three years after the individual terminates employment.

5. A commitment that refresher training will be provided, by the RSO or an instructor whose qualifications are those described in Part II of Appendix D of this guide. Indicate the frequency of the refresher training. The refresher training should include participating in "dry runs" of your emergency procedures and reviewing (1) operating and emergency procedures, including lock-out/tag-out procedures as appropriate, (2) changes in applicable regulations or license conditions, and (3) deficiencies identified during the performance of annual audits of the radiation protection program. Refresher training may also include review of applicable Department's Information Notices and Bulletins. Typically, refresher training lasts 2-4 hours; refresher training of shorter duration is acceptable provided it encompasses participation in "dry runs" and review of the items listed above.

You should maintain records of the refresher training, including the date of the training, identity of the instructor, list of attendees, and topics covered. These records should be kept for at least three years.

NOTE: An alternative training program should meet the criteria in Part I of Appendix D to this guide. The Department does not consider a training program adequate if the only qualification of the instructor is completion of the device manufacturer's training program. In general, an instructor should have the training and experience outlined in Part II of Appendix D. The course instructor's qualifications are important in order to avoid "pyramid training" (i.e., persons with minimal training train new individuals who, in turn, train others). Individual qualifications will vary and authorization of trainers may be made on a case-by-case basis.

In a case-by-case review, the Department may consider the extent to which the following factors offset the need for some of the formal training outlined in Part II of Appendix D: possession of a Bachelors (or more advanced) degree in a physical science or engineering; possession of a license as a professional engineer; an extensive amount of field experience; use of instruction materials (e.g., instructor's notes, slides, handouts, videotapes, test questions) prepared by more highly qualified individuals (e.g., certified health physicist); grading of students' tests by more highly qualified individuals.

Item 9. Facilities and Equipment

Georgia Rule 391-3-17-.01(2)(mmmm) defines a restricted area as "any area to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to sources of radiation and radioactive material. A restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area."

1. For each proposed permanent facility listed in Item 2b of the application form, specify whether the proposed facility currently exists, is under construction, or is planned for future construction. If the facility is under construction or planned for future construction, include the estimated completion date.
2. Describe the general location of each proposed permanent facility listed in Item 2b (e.g., located in an industrial park, a rural area, etc.) and its current use. Provide diagrams of the facility that include the building, the proposed restricted area(s) and adjacent areas, including above and below the restricted areas and explain how radiation levels in unrestricted areas will be controlled and monitored to comply with 391-3-17-.03(5)(i). The diagram should indicate the location of each gauge.
3. If the gauges will be stored at any time, describe the storage locations at each address listed in Item 2b of the application and submit a diagram showing where the gauge(s) may be stored when not installed.
4. Describe the security measures that will be taken during use and storage of gauges at the addresses listed in Item 2b of the application form.

Item 10. Radiation Protection Program

As the licensee, you are responsible for the conduct of your radiation protection program at all facilities and for the actions of all your employees. If you list more than one facility as an authorized location of use, you should design your radiation protection program to be applicable to all listed facilities and all your employees. In addition, you are required by Rule .03(4) to verify at least annually that your licensed activities are being conducted in compliance with the Department's regulations and the terms and conditions of your license.

It is very important that you document all activities conducted under your license to demonstrate regulatory compliance. Records showing activities conducted under your license are evidence of your efforts to be in compliance. For example, during inspections, inspectors may request records of the receipt, transfer, and disposal of licensed material, and training for authorized users.

10.1 Personnel Monitoring Program

Personnel monitoring equipment is to be used by individuals entering restricted areas that are likely to receive a dose in excess of 10% of the dose specified in 391-3-17-.03(5)(a). The specified annual dose to the whole body of adults is 5 rems (0.05 sievert). The whole body includes the head, trunk (including male gonads), arms above the elbow, and legs above the knee. The specified annual dose limit to the skin or any extremity (shallow dose equivalent) is 50 rems (0.50 sievert). The specified annual dose limit for minors is 10% of the annual dose limits specified for adult workers, and the specified occupational dose limit for the embryo/fetus of a declared pregnant woman is 0.5 rem (5 millisieverts).

You will need to monitor all authorized users and individuals working in the proximity of the gauges with a film badge, optically stimulated luminescent devices (OSL) or thermoluminescent dosimeter (TLD). Unless you can demonstrate, in accordance with 391-3-17-.03(8)(b), that individuals working in proximity of the gauges are not likely to receive a radiation dose in excess of 10% of the allowable limits (e.g., the source in the installed gauge does not emit gamma or high-energy beta radiation); or the gauges are installed in locations which are normally inaccessible and your company does not service the gauges. If authorized for extended maintenance users shall wear appropriate dosimetry.

Accordingly, you should provide the following information on your monitoring program, as appropriate:

1. Calculations documenting your evaluation that unmonitored gauge users are not likely to receive radiation doses in excess of 10% of the allowable limits,

OR

2. A commitment to monitor all gauge users with a film badge, OSL or TLD when they use gauges. Including the following:
 - a. The name of the supplier of the monitoring equipment you will use which must be accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
 - b. Identify the type of personnel monitoring equipment that will be used (i.e., film badge, OSL or TLD).
 - c. Specify the frequency with which film badges, OSL's or TLD's will be exchanged. Acceptable exchange frequencies are every 3 months for OSL's or TLD's and every month for film badges. Other exchange frequencies can be considered based on the frequency of using installed gauges. The personnel monitoring device vendor may recommend an exchange frequency based upon the type of monitoring equipment you will be using. If you want to be authorized to perform servicing of gauges it may be necessary, depending on the level of maintenance you chose to perform, to use extremity monitors.

10.2 Radiation Detection Instruments

It is **not necessary** to have a radiation survey meter to make surveys during routine use of the device. However, if you plan to install, relocate, perform maintenance on, or repair the device, a survey meter will be required. (See Appendix F of this guide)

If survey meters are required, please submit:

1. A commitment to have at least one appropriate, calibrated survey meter at each jobsite for timely evaluation of source integrity before performing servicing or following an incident. This commitment should list the type and ranges of survey instruments you will have available, specify that the instruments will be calibrated by a company licensed to perform this service, and describe how you will ensure that a survey instrument is working properly. The rules require the survey instruments to be calibrated annually or following any repair that affects the calibration.

OR

2. The following statement: "The survey instrument will be capable of measuring between 1 microsievert

per hour (0.1 millirem per hour) and 1 millisievert per hour (100 millirems per hour). This instrument will be used to perform surveys in conjunction with servicing or after an incident. Each survey instrument will be calibrated at intervals not to exceed 12 months. Before using a survey instrument, we will check the response of the instrument with a dedicated check source that was supplied with the instrument and, if the instrument does not respond properly, we will not use the instrument until it is repaired and operable or until we obtain an operable instrument."

NOTE: If you plan to perform gauge servicing that requires removal of the source from its shielded position, you should address the items listed in Appendix F, one of which deals with the possession and use of radiation detection instrumentation.

10.3 Leak Testing

A leak test (i.e., a check for removable radioactive contamination) is required to be performed at 6 month intervals or an interval approved by the Department. The measurement of the leak test sample needs to be quantitative, and the instrumentation used to analyze the sample needs to be sufficiently sensitive to detect 185 Becquerel (0.005 microcurie) of radioactivity.

The options for leak testing are:

1. Engage the services of a consultant, commercial facility, or the gauge manufacturer to take, evaluate, and report sample results to you.
2. Use a commercial leak test kit. In this case, you take the smear and send it to the kit supplier, who reports the results to you.
3. Perform the entire leak test sequence yourself, including taking the smears, making the measurements, and calculating the results.

For Option 1, specify that leak tests will be performed at intervals not to exceed 6 months (or an interval approved by the Department) and provide the name, address, and radioactive materials license number of the consultant, commercial organization, or gauge manufacturer who will perform leak tests for you.

For Option 2, specify that leak tests will be performed at intervals not to exceed 6 months (or an interval approved by the Department) and provide the name, address, and license number of the kit supplier, the model number of the kit you will use, and your commitment to follow the supplier's instructions for collecting the leak test sample. In addition, you should submit information on the supplier's procedures for analyzing samples collected using its kit and providing timely reports of the results to you. In your application, you should also state that the test samples will be taken by the individuals specified in Item 7 who is responsible for your radiation protection program, or trained authorized users specified in Item 8.

For Option 3, request a copy of the Department's "Leak Test Guide," which is also available on the Departments' web site.

10.4 Inventories

The Department requires that licensees must periodically account for all sealed sources and devices received and possessed under their license. Once your license is approved, there will be a condition stipulating that you, the licensee, must conduct inventories at six month intervals. You should maintain records of the inventories for the next Departmental inspection. Your inventory records should include the radionuclide

and amount (in units of Becquerel or Curies) of radioactive material in each sealed source; the manufacturer's name, model number and serial number (if appropriate) of each device containing radioactive material; the location of each sealed source and device, the date of the inventory, and the name of the individual conducting the inventory.

10.5 Maintenance

Any maintenance (e.g., cleaning) will always be performed with the radioactive source in the safe, shielded position in accordance with the manufacturer's directions or recommendations. More extensive maintenance will be performed by the gauge manufacturer. Unless specifically authorized on your license, you may not do any maintenance or cleaning unless the source is safely shielded within the gauge.

If you wish to perform any maintenance or cleaning of the gauging device you should provide the information listed in Appendix F.

10.6. Transportation of Devices

It is your responsibility as a licensee to become familiar with all applicable Department of Transportation (DOT) regulations to help ensure safe transportation of radioactive materials. The applicable DOT regulations are outlined in 10 CFR 71.5, "Transportation of Licensed Material." Fixed gauges are rarely transported. Transportation for fixed gauges usually occurs when a gauge is shipped back to the manufacturer for repair or disposal, or to a sister company licensed to receive the gauge. It is best to contact the manufacturer of the gauge to determine the current shipping procedures to ensure your company is in compliance with State and Federal DOT regulations.

10.7 Operating and Emergency Procedures

The Department requires that all installed gauge licensees submit operating and emergency procedures to the Department for review. You should:

1. Commit to having and implementing operating and emergency procedures, as described in correspondence with the Department;
2. Commit to providing a copy of your operating and emergency procedures to all users of gauging devices before they begin using the gauges;
3. Submit a copy of your operating and emergency procedures. Your procedures should include the requirements and prohibitions outlined in this guide in Appendix E, "Standard Operating and Emergency Procedures," but yours will be more detailed than those in Appendix E to accommodate your particular situation.

In addition, lock-out/tag-out procedures will be required if it is possible that a major portion of an employee's body could receive exposure from the radiation beam from certain devices. You should have lock-out/tag-out procedures so that personnel will not be subjected to unnecessary exposure. The procedure should specify the means for preventing employees from entering the radiation beam during maintenance, repairs, or other work in, on, or around the bin, tank, or hopper on which the device is mounted. You need to submit the procedures and post them at the facility so that personnel can see them.

10.8 Annual Audit of Radiation Protection Program

Georgia's Rule 391-3-17-.03(4) requires each licensee to: (1) develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the regulations, (2) use procedures and engineering controls to achieve occupational doses and doses to members of the public that are ALARA, and (3) review, at least annually, the content and implementation of their radiation program. Licensees are required by 391-3-17-.03(14)(b) to maintain records of their radiation protection program. Licensees must maintain records of the provisions of their radiation protection program until the Department terminates the pertinent license. Licensees must also maintain records of audits and other reviews of program content and implementation for 3 years after the record is made.

As noted in Appendix C, the RSO needs to ensure that annual audits are conducted, but does not necessarily need to conduct the audits themselves. In fact, if the RSO is one of the authorized gauge users, it may be beneficial for a qualified individual (e.g., radiation safety consultant, the corporate RSO) who is not associated with day-to-day operations to conduct the audit.

In lieu of describing the scope and extent of the audits, you may state, "We will conduct audits as described in Appendix G of this guide."

If your procedure does not follow the guidance in the model, you may develop your own procedures for review. The audit should be sufficiently detailed to ensure that (1) the licensee is abiding by the Department's and DOT's regulations and the terms and conditions of the license (e.g., periodic leak tests and inventories, only trained and approved individuals use gauges independently), (2) the content and implementation of the licensee's radiation protection program achieve occupational doses and doses to members of the public that are ALARA, and (3) the licensee maintains all appropriate records (e.g., records of personnel exposure, leak tests, inventory, training of gauge users) sufficient to comply with the Department's requirements.

These audits may be conducted as "mini-inspections" similar to those conducted by the Department and may include observation of some or all of the licensee's authorized users during actual or simulated use of installed gauges. Department inspections have identified some common violations among installed gauge licensees: failure to perform leak tests or conduct inventories at the required frequency, unauthorized personnel performing maintenance on gauges, possession and use of sealed source or device combinations other than those specified on the license, and an unauthorized individual as RSO.

You should submit (1) the name and radiation safety qualifications of the individual who will conduct audits, (2) a description of the scope and extent of the audits, (3) a commitment to conduct audits at intervals not to exceed 12 months and to maintain records of the audits for next Departmental inspection after the record is made, (4) management's commitment to review the documented results of the audit promptly after the audit's completion, and (5) a commitment to take prompt action to correct deficiencies identified during audits and to inform the licensee's personnel (including those at other locations and those working under other licenses) of the deficiencies and the actions management expects its personnel to take to avoid similar deficiencies.

10.9 Financial Assurance and Record keeping for Decommissioning

Rule .02(8)(g) requires that applicants for, or holders of a specific license authorizing the possession of large sealed sources or plated foil sources must provide financial assurance for decommissioning. All applicants and licensees are responsible for decommissioning their facilities. Certain radioactive material applicants and licensees must provide up-front financial assurance for decommissioning in accordance with Rule.02(8)(g). Generally licensees possessing less than the following will not be required to provide up-

front financial assurance for decommissioning: ^{137}Cs -100,000 Curies, ^{60}Co - 10,000 Curies, ^{241}Am -100 Curies, ^{85}Kr -1,000,000 Curies or ^{90}Sr - 1,000 Curies. For isotopes not listed or if you will be utilizing more than one isotope see Rule .02(8)(g).

Item 11. Waste Management

Because of the nature of the licensed material contained in devices, your only option for disposal is to transfer the material to an authorized recipient. Authorized recipients are the original supplier of the device, a commercial firm licensed by the Department, NRC or an Agreement State to accept radioactive material from other persons, or another specific licensee authorized to possess the licensed material (i.e., whose license specifically authorizes the source and gauge by manufacturer's name and model numbers or similar designation). No one else is authorized to receive licensed material.

Before transferring radioactive material, you must verify that the recipient is properly authorized to receive it by using one of the methods described in 391-3-17-.02(19)(d). In addition, you must package and ship the material in accordance with the Department's and DOT regulations, and you must maintain records of the transfer as required by 391-3-17-.06(18). In response to Item 11, it is acceptable to state "disposal will be by transfer of the radioactive material to a person who is specifically licensed to receive and possess it."

Item 12. License Fees

The applicant should refer to the Radioactive Materials License Fee Schedule (Appendix B) to determine the appropriate licensing fee and category. (Note that, in addition to licensing fees, licensees are required to pay annual fees.) No action will be taken on applications filed without the proper fee. Checks for the fees should be made payable to the **Department of Natural Resources, Radioactive Materials Program**, and mailed to the following address:

Radioactive Materials Fees
P.O. Box 101161
Atlanta, Georgia 30392

Mail license applications, amendment, renewal requests, and terminations of license including a copy of the check for the appropriate fee to the following address:

Radioactive Materials Program
4220 International Parkway
Atlanta TradePort, Suite 100
Atlanta, GA. 30354

Note: Prior approval from the Department must be obtained before Small Entity classification can be used.

Item 13. Certification

If you are an individual applicant acting in a private capacity, you must sign the completed application form. Otherwise, the application should be dated and signed by a representative of the applicant's corporation or legal entity; the representative must be authorized to make binding commitments and to sign official documents on behalf of the applicant and must certify that the application contains information that is true and correct to the best of the signer's knowledge and belief. Unsigned applications will not be reviewed and will be returned for proper signature.

IV. AMENDMENTS TO A LICENSE

After you are issued a license, you must conduct your program in accordance with (1) the statements, representations, and procedures contained in your application and other correspondence with the Department, (2) the terms and conditions of the license, and (3) the Department's regulations.

It is your obligation to keep your license current. Anticipate the need for a license amendment insofar as possible. If any of the information provided in your application is to be modified or changed, submit an application for a license amendment. In the meantime, you must comply with the terms and conditions of your license until it is actually amended. Department regulations do not allow you to implement changes on the basis of a submission requesting an amendment to your license.

An application for a license amendment may be prepared either on the application form, Appendix A-1, or in a letter and should be prepared in duplicate. Retain one copy because the license requires that you possess and use licensed material in accordance with the statements and representations in your amendment request and in any supplements to it.

Your application should state your license number and clearly describe the exact nature of the changes, additions, or deletions. References to previously submitted information and documents should be clear and specific and identify the pertinent information by date, page, and paragraph. For example, if you wish to change the RSO, your application for a license amendment should specify the proposed RSO's name, and include documentation of the individual's training and experience.

The appropriate fee for a license amendment should be sent to the address listed in Item 12 for Radioactive Materials Fees. A copy of the check should be included with the amendment request and sent to the Radioactive Materials Program address as listed in Item 12. The Department will not issue the amendment prior to receipt of the proper fee as specified in the Fee Schedule, Appendix B.

V. RENEWAL OF A LICENSE

Licenses are issued for a period of up to 5 years. Send an application for renewal, to the address specified in Item 12 of this guide. Retain a copy of the renewal because the license requires that you possess and use licensed material in accordance with the statements and representations in your renewal request and in any supplements to it.

You may submit an entirely new application for renewal as if it were an application for a new license without referring to previously submitted information. This is the preferred method of renewing a license, especially for those whose licenses reference a large number of documents or old documents. Submitting an entirely new application allows you to reevaluate your program periodically and consolidate the description of your program into one or two up-to-date documents. A new application ensures that your program contains all needed information as requested in current licensing guidance.

As an alternative to a new application, you may:

1. Review your current license to determine whether the information about sealed sources and installed gauging devices accurately represents your current and anticipated program. Identify any necessary additions, deletions, or other changes and then prepare information appropriate for the required additions or changes.

2. Review the documents submitted to the Department in the past to determine whether the information is up-to-date and accurately represents your facilities, equipment, personnel, radiation safety procedures, locations of use, etc. The documents considered to represent your current program must be identified by date. Also identify any out-of-date and superseded documents and indicate the changes in them that are necessary to reflect your current program. Documents referenced in your license should not be older than ten years unless all the information in the document accurately represents your current program. If you need to update information in documents ten years or older, you should submit a new application. If you follow this process you will need to submit an entirely new application every ten years (or each alternating renewal).
3. Review current Department regulations to ensure that any changes in the regulations are appropriately covered in your program description.
4. After you have completed your review, submit a letter to the Department requesting renewal of your license and providing the information in 1, 2, and 3 above, as necessary, keeping a copy for your records.
5. Include the name and telephone number of the person to be contacted about your renewal application and include a current mailing address if it is not indicated correctly on your license.

In accordance with Rule .02(15), you should file your application for license renewal at least 30 days before the expiration date of your license, your present license will automatically remain in effect until the Department takes final action on your renewal application. However, if you file an application less than 30 days before the expiration date and the Department cannot process it before that date, you will be without a valid license when your license expires.

If you do not wish to renew your license, see section VI. Termination of a License.

If you cannot dispose of all the licensed radioactive material in your possession before the expiration date, you must request a license renewal. The renewal is necessary to avoid violating the Department's regulations that do not allow possession of licensed material without a valid license.

VI. TERMINATION OF A LICENSE

You may request termination of your license at any time. This request should include a completed Department's form, "Request to Terminate Radioactive Materials License" (see Appendix H), with appropriate documentation certifying that all sources have been disposed of in accordance with Rule .02(19). An application for license termination does not relieve the licensee from its obligations to comply with Department's regulations and the terms and conditions of the license.

**Appendix B
Fee Schedule
Fee Category C.10**

| License category | Non-routine inspection fee | Application | Amendment | Annual Fee | | |
|-------------------------|-----------------------------------|--------------------|------------------|-------------------|---------------------|-------------------|
| | | | | Nominal | Small Entity | Lower Tier |
| Installed gauges | \$1200.00 | \$500.00 | \$380.00 | \$840.00 | \$840.00 | \$475.00 |
| Gas Chromatograph | \$1200.00 | \$500.00 | \$380.00 | \$800.00 | \$800.00 | \$435.00 |

APPENDIX C
DUTIES AND RESPONSIBILITIES OF THE RADIATION SAFETY OFFICER

The Radiation Safety Officer (RSO) is responsible for implementing the radiation protection program and ensuring that radiation safety activities are performed in accordance with approved procedures and regulatory requirements.

The RSO's duties and responsibilities include the following:

1. Ensure that licensed material possessed by the licensee is limited to the kinds (e.g., cesium-137 as a sealed source) and quantities of radioactive material listed on the license.
2. Ensure that only individuals authorized by the license use the devices.
3. Ensure that individuals using gauges are properly trained; are designated by the RSO; receive refresher training including participation in a "dry run" of emergency procedures and a review of operating and emergency procedures including lock-out/tag-out procedures; and are informed of all changes in regulatory requirements and deficiencies identified during annual audits.
4. Ensure that personnel monitoring devices, if required, are used as required and reports of personnel exposure are reviewed in a timely manner, alert the radiation worker in the event of a high or unusual exposure, and to investigate all such unusual exposures and take any necessary corrective action to prevent those incidents from occurring again.
5. Ensure that the gauges are properly secured against unauthorized removal at all times.
6. Ensure that proper authorities are notified in case of accident, damage to gauges, fire, or theft.
7. Ensure that audits are performed at least annually to ensure that (a) the licensee is abiding by the Department's regulations and the terms and conditions of the license (e.g., periodic leak tests, inventories, use limited to trained, approved users), (b) the licensee's radiation protection program content and implementation achieve occupational doses and doses to members of the public that are ALARA, and (c) the licensee maintains required records with all required information (e.g., records of personnel exposure; receipt, transfer, and disposal of licensed material; gauge user training) sufficient to comply with Department requirements.
8. Ensure that all incidents, accidents, and personnel exposure to radiation in excess of 391-3-17-.03(15) are investigated and reported to the Department and other authorities, as appropriate, within the required time limits.
9. Ensure that licensed material is transported in accordance with all applicable DOT requirements.
10. Ensure that licensed material is transferred or disposed of properly.
11. Ensure the RSO has up-to-date copies of Department regulations; reviews new or amended Department regulations; and revises licensee procedures, as needed, to comply with Department regulations.
12. Ensure that the license is amended whenever there are changes in licensed activities, responsible individuals, or information or commitments provided to the Department in the licensing process.

APPENDIX D

CRITERIA FOR TRAINING COURSES AND INSTRUCTOR QUALIFICATIONS

Part I: Criteria for Acceptable Training Courses for Installed Gauge Users

Courses are at least 8 hours

Course provides instruction in the following topics (the hours next to each topic are suggestions):

1. Radiation Physics (0.5 hour)
 - Atomic and Subatomic Structure
 - Radioactivity and Types of Radiation
 - Sources of Radioactivity
 - Isotopes and Periodic Table
 - Units of Radiation Measurement and Half-Life
2. Radiation Safety (1.0 hour)
 - Biological Effects of Radiation
 - Occupational Dose Limits
 - ALARA
 - Methods to Reduce Dose
 - Personnel Monitoring
3. Regulatory Requirements (1.5 hours) of Licensing
 - Storage of Licensed Material
 - Constant Control and Surveillance of Radioactive Material Not in storage
 - Personnel Monitoring
 - Leak Testing
 - Inventory
 - Maintenance
 - Operating and Emergency Procedures (Lock-out/tag-out procedures if applicable)
 - Audits
 - Record keeping
 - Disposal
4. Transportation (0.5 hour)
 - Requirements in 10 CFR 71.5 and 49 CFR
 - Shipping by Common Carrier
5. Gauge Theory, Operation and Field Training (3.5) hour
6. Written Test and Test Review (0.5) hour

Successful completion of the course requires obtaining a score of at least 70 percent on a closed-book test consisting of at least 50 questions that have not been provided to the students before the test.

Course instructors meet the qualifications outlined in Part II.

Part II: Criteria for Qualifications for Instructors of installed Gauge Users

Each instructor who trains individuals as installed gauge users:

- Is a high school graduate or has a general equivalency diploma (GED) **AND**
- Has successfully completed a course that meets the criteria in Part I above **AND**
- Has successfully completed at least a 40-hour course in radiation safety principles and practices **AND**
- Has at least 32-hours of hands-on experience in the use of installed gauge devices.

If the training courses or qualifications of instructors do not meet the criteria in this Appendix, an applicant may submit to the Department, the information requested in Item 8.2 of this regulatory guide as part of a request for a licensing action, and the applicant's proposal will be considered on a case-by case basis.

ATTACHMENT 1

TRAINING TOPICS FOR INSTALLED GAUGE USERS

Radiological emergency response procedures for a damaged installed gauge and installed-gauge accident scenarios, to avoid incidents and accidents with installed gauges

Loss prevention, security, surveillance, and storage

Physical inventory, accountability

Notification of the Department regarding damage devices and sources

Proper disposal of gauges by transfer to the manufacturer (to avoid inadvertent transfer of a gauge to a scrap-metal broker and a possible foundry contamination incident)

Gauge labels and markings, necessary area signs (Caution: Radioactive Material)

Radiation safety instruction for gauge users

Proper use of personnel-monitoring devices

The terms and conditions of the license, and the occasions when it is appropriate to amend the license

Review procedures for maintenance, installation or relocation of the gauge (if authorized to perform these functions) and also include use of a survey meter

APPENDIX E

STANDARD OPERATING AND EMERGENCY PROCEDURES

The following Radiation Protection Program will be followed at all times. A copy of these procedures shall be maintained in the licensee's radioactive materials license file.

1. Only authorized users shall use, or supervise the use of, the gauge(s).
2. The licensee shall not remove a source holder or open a source containing radioactive material.
3. No one shall be permitted to touch or handle directly an unshielded source.
4. The user shall never unnecessarily expose himself to the unshielded source.
5. The gauge shall be locked in the safe, off, closed, or stored position when not in use.
6. Security of the nuclear gauge(s) shall be maintained at all times.
7. Only licensed operators shall have or carry keys to the shutters of the nuclear gauges or to their locked storage areas. The Radiation Safety Officer shall maintain key control.
8. If the operator detects any malfunction in the shutter or other part of the gauge, the Radiation Safety Officer shall be immediately notified.
9. Authorized users and individuals working in the proximity of the nuclear gauges who are likely to receive occupational doses greater than 10% of the limits specified in 391-3-17-.03(5) or if authorized for extended maintenance shall wear appropriate personnel dosimeters, such as film badges, OSL's or TLD's. Each worker shall be assigned his own dosimeter. On no occasion shall a person wear a dosimeter assigned to another individual. Personnel dosimeters shall be kept in a cool, dry area, and in a low radiation background when not in use.
10. The personnel dosimeter shall be processed immediately if there is any indication of a high or unusual exposure, or if the dosimeter is damaged in any way. The Radiation Safety Officer shall investigate all high or unusual exposures, and take corrective action if necessary to prevent other such high exposures. Notification procedures shall be in accordance with Rule .07.
11. Exposure records shall be maintained on file for the Department's review.
12. If personnel monitoring is required, the company shall maintain on file indefinitely the exposure records of employees and past employees, and supply such employees with exposure data annually and at termination of employment or hiring by another employer.
13. Transportation of gauges shall be in accordance with the requirements of Rule .06.
14. The Licensee shall maintain current copies of the following publications along with the Radioactive Materials license, all amendments and supportive documents: Chapter 391-3-17 "Rules and Regulations for Radioactive Materials," "Notice to Workers" and the "Emergency Radiological Assistance Telephone Directory."

15. For out-of-service gauges that are stored, as appropriate a “CAUTION RADIOACTIVE MATERIALS” sign shall be posted on the door of the storage area with a "Notice to Workers" in a conspicuous place wherever individuals work in or frequent any portion of a restricted area. The “Emergency Radiological Assistance Telephone Numbers” should be accessible to key personnel.
16. Leak testing of sealed sources is required at specific intervals, and shall be performed in the manner designated in the application form. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Department.
17. Shutters in gauges may be opened and closed by any person who has the minimum basic training listed in 1, above and approved by the RSO.
18. Shutter closure and opening may be performed by untrained individuals only if the label affixed to the gauge allows this practice.
19. The initial installation of gauges shall be in accordance with the manufacturer’s instruction, instructions available in the Sealed Source and Device Registry for the device, and the commitments made in the license application.
20. Gauge relocation may be performed only by the manufacturer or it’s agent, or, if specifically authorized by the license, by an authorized user trained to do maintenance, unless the label affixed to the gauge specifically allows relocation.
21. All surveys must be performed by persons authorized by the license to perform such surveys. The persons who may be authorized to do surveys are:
 - the manufacturer;
 - a representative of the manufacturer;
 - an authorized user trained by the manufacturer or his agent.

Persons who conduct surveys must have had documented health physics training, unless otherwise approved by the Department. The training must include restricted and unrestricted areas, occupancy, use of instruments, types of instruments, and radiation dose hazards.

Emergency Procedures

If the source fails to return to the shielded position (e.g., as a result of being damaged) or if any other emergency or unusual situation arises (e.g., the gauge falls from its mount, or is in a fire or explosion):

1. Immediately secure the area around the gauge.
2. Prevent unauthorized personnel from entering the secured area.
3. If any heavy equipment is involved, detain the equipment until it is determined that there is no contamination present.
4. Notify licensee management of the situation, by having someone call company personnel in the

order listed below. (Never leave the gauge unattended.)

| | NAME* | WORK PHONE NUMBER* | HOME PHONE NUMBER* |
|----|-------|--------------------|--------------------|
| 1. | _____ | _____ | _____ |
| 2. | _____ | _____ | _____ |
| 3. | _____ | _____ | _____ |

* List (and update, as needed) the names and telephone numbers of the Radiation Safety Officer (RSO) or other knowledgeable licensee staff to be contacted in case of emergency.

5. Follow the directions provided by the person contacted in step 4.

6. LICENSEE MANAGEMENT MUST:

6.1 Arrange for a survey to be conducted as soon as possible by a knowledgeable person using appropriate radiation detection instrumentation. (This person could be a licensee employee using a survey meter located at the jobsite, a consultant, or a manufacturer's representative.)

6.2 Make necessary notifications to local authorities and notify the Department, as required. (Even if not required to do so, you may report ANY incident to the Department by calling the Department's Emergency Number at (404) 656-4863, which is staffed 24 hours a day, outside the Atlanta area use 1-800-241-4113. Department notification is required when gauges containing licensed material are lost or stolen, and when gauges are damaged or involved in incidents that result in doses in excess of the dose limits in accordance with Chapter 391-3-17-.03(15)(b).

6.3 Consider the timeliness of reports to the Department.

6.4 Review the reporting requirements, which are found in 391-3-17-.03(15)(a).

APPENDIX F

EXTENDED MAINTENANCE

If you are considering performing installation, relocation, maintenance or cleaning of gauges that requires the removal of the radioactive source from the shielded position, i.e., extended maintenance, you should keep in mind the radiation levels you may encounter. A typical gauge contains approximately 300 millicuries of cesium-137. In about 18 seconds, an unshielded cesium-137 source of this activity can deliver 5 rems (0.05 sievert) to a worker's hands or fingers (extremities), assuming the extremities are 1 centimeter from the source.

Thus, to perform extended maintenance, you must have special training, follow special procedures, use a radiation survey meter, use special shields and tools, use special personnel monitoring devices, and take appropriate radiation safety precautions. Accordingly, provide the following information:

1. Type of Work To Be Performed

Describe the types of work, installation, relocation, maintenance, or cleaning that you wish to perform that necessitate removal of the source holder or radioactive source from the shielded position and indicate the specific manufacturer's name and model number of the gauges on which you will perform extended maintenance.

2. Training and Experience

List the individuals who will perform extended maintenance and describe their training and experience in performing extended maintenance. Individuals are considered on a case-by-case basis. For each individual proposed to perform extended maintenance, list all radiation safety courses the individual has taken; the amount of hands-on experience the individual has had involving extended maintenance, including the manufacturer's name and model number of the gauge and the type and frequency of extended maintenance performed; and why you consider the individual competent to perform extended maintenance safely.

3. Handling Procedures

Submit your procedures for the safe handling of the radioactive source while the source is outside the gauge. Your procedures should require a documented radiation profile survey to be performed all around the gauge initially and after installation and relocation. The distances for surveys should be at 5 cm, 30 cm, and 100 cm. Unauthorized individuals will not be allowed into the areas where extended maintenance is performed and where the gauge is located; containers shielding the source will be labeled "Caution Radioactive Material"; the source will be under the constant surveillance of an authorized user when not in storage and will be secured against unauthorized removal or access when in storage; and the manufacturer's instructions and recommendations for performing extended maintenance will be followed.

4. Personnel Monitoring

Describe how you will ensure that radiation exposure to individuals performing extended maintenance will not exceed 391-3-17-.03(5)(a) limits. An acceptable response is that individuals performing extended maintenance on gauges will always wear both whole body and extremity monitoring devices. Describe frequency of exchange for both types of devices.

5. Survey Instrumentation

If you have already provided detailed information on survey instruments in response to Item 10.2, state, "See response to Item 10.2." Otherwise, list the type and ranges of survey instruments you will have available, state the frequency of calibration, and state who will perform the calibration. Also include how you will ensure that the survey instrument is working properly. You should commit that, if the instrument does not respond properly, you will not perform extended maintenance on the gauges until the survey instrument is repaired and operable or until you obtain an operable instrument.

For example, you may state that a survey instrument capable of measuring between 1 microsievert per hour (0.1 millirem per hour) and 1 millisievert per hour (100 millirems per hour) will be used to perform the surveys and that the survey instrument will be calibrated annually by the manufacturer. In addition, you may state that, before each use of the instrument, you will check the response of the instrument with a dedicated check source that was supplied with the instrument.

6. Surveys

Describe how you will ensure that radiation levels in areas where extended maintenance will take place do not exceed limits. For example, you may (1) commit to performing surveys with a survey instrument (as described above), (2) specify where and when surveys will be conducted during extended maintenance, and (3) commit to maintaining records of the survey (e.g., who performed the survey, date of the survey, instrument used, measured radiation levels correlated to location of those measurements), for 3 years from the date of the survey.

Note: Initial radiation profile must be maintained for the life of the device.

APPENDIX G

SAMPLE AUDIT PROGRAM

An audit is conducted, in part, to fulfill the requirements of Chapter 391-3-17-.03(4)(c) for an annual review of the content and implementation of the licensee's radiation protection program. It should also identify program weaknesses and allow licensees to take early corrective actions (before a Department inspection). During an audit, the auditor needs to keep in mind not only the requirements of Department regulations, but also the licensee's commitments in its applications and other correspondence with the Department. The auditor should also evaluate whether the licensee is maintaining exposures to workers and the general public as low as is reasonably achievable (ALARA), and if not, make suggestions for improvement.

The outline in this appendix can be used to document the annual audit of the radiation protection program. Guidance is provided on completing each section; note any deficiencies that were identified and the corrective actions taken (or to be taken).

1. Audit History.
Enter the date of the last audit, whether any deficiencies were identified, and whether actions were taken to correct the deficiencies.

2. Organization and Scope of Program.
Briefly describe the organizational structure, noting any changes in personnel. Describe the scope of licensed activities at the audited location. Check whether the Radiation Safety Officer (RSO) is the person identified in the license and fulfills the duties specified in the license.

3. Training, Retraining, and Instructions to Workers.
Ensure that workers have received the training required by Chapter 391-3-17-.07(3). Be sure that, before being permitted to use a gauge, the user has received training (from the manufacturer or in an alternative course approved by the Department) and has a copy of, and training in, the licensee's operating and emergency procedures; records must be maintained. Note whether refresher training is conducted in accordance with licensee commitments. By interview and observation of selected workers, ensure that each has a copy of the licensee's operating and emergency procedures and can implement them properly.

4. Internal Audits.
Verify that audits fulfill the requirements of record keeping requirements as outlined in Chapter 391-3-17-.03(14), are conducted in accordance with licensee commitments, and are properly documented.

5. Facilities.
Verify that the licensee's facilities are as described in its license documents.

6. Materials.
Verify that the license authorizes the sealed source/ device combinations that the licensee possesses. Verify that the licensee uses the source/device combinations in accordance with license provisions. Ensure that gauges are maintained in accordance with licensee commitments.

7. Leak Tests.

Verify that all sealed sources are tested for leakage at the prescribed frequency and in accordance with licensee commitments. Records of results must be maintained.

8. Inventories.

Verify that inventories are conducted at least once every 6 months to account for all sealed sources; inventory records must be maintained.

9. Radiation Surveys.

Verify that the licensee has at least one operable, calibrated survey instrument, if required, at each jobsite and that the instruments are calibrated in accordance with licensee commitments; calibration records must be retained for three years after the record is made.

10. Receipt and Transfer of Radioactive Material (Includes Waste Disposal).

Verify that gauges received from others (e.g., new gauges) are received, opened, and surveyed in accordance with Chapter 391-3-17-.02(19) and .03(12). Ensure that gauge transfers are performed in accordance with 10 CFR 71.5 and 49 CFR. Records of surveys, receipt, and transfer must be maintained in accordance with Chapter 391-3-17-.03(14) and .06(18).

11. Transportation.

Determine compliance with Department of Transportation (DOT) requirements. Verify that radioactive packages are prepared, marked, and labeled in accordance with 49 CFR Parts 172 and 173 requirements. Be sure that the licensee has records of performance testing of its special form sources and DOT-7A packages. Verify that shipping papers are prepared, contain all needed information, and are readily accessible during transport (49 CFR 172.200-204 and 177.817). Check that packages are blocked and braced (49 CFR 177.842). Check for any needed placarding (49 CFR 172.504); if overpacks are used, verify that they are properly marked and labeled (49 CFR 173.25). For Department inspection the required information for shipments is listed in Rule.06(18).

12. Personnel Radiation Protection.

Evaluate the licensee's determination that unmonitored personnel are not likely to receive more than 10 percent of the allowable limits. Alternatively, if personnel dosimetry is provided and required, verify that it complies with Chapter 391-3-17-.03(8) and licensee commitments. Review personnel monitoring records; compare exposures of individuals doing similar work; determine reasons for significant differences in exposures. If any worker declared her pregnancy in writing, evaluate the licensee's compliance with Chapter 391-3-17-.03(5)(h). Check whether records are maintained as required by Chapter 391-3-17-.03(14)(g). See the Department's "Guide For Instruction Concerning Prenatal Radiation Exposure."

13. Auditor's Independent Measurements, If Made.

If the licensee performs extended maintenance, the auditor should make independent measurements and compare the results with those made or used by the licensee. If the licensee does not perform extended maintenance, the auditor may, if desired, make independent measurements.

14. Notification and Reports.

Check on the licensee's compliance with the notification and reporting requirements in Chapter 391-3-17-.03(15). Ensure that the licensee is aware of the emergency telephone numbers for the Department.

15. Posting and Labeling.
Check for compliance with the posting and labeling requirements of Chapter 391-3-17-.03(12)(b).
Ensure all labels on gauges are legible.
16. Record keeping for Decommissioning.
Check to determine compliance with Chapter 391-3-17-.02(8)(g).
17. Bulletins and Information Notices.
Check to determine whether the licensee is receiving bulletins and information notices. Check whether the licensee took appropriate action in response to Department's mailings.
18. Special License Conditions or Issues.
Verify compliance with any special conditions on the licensee's license. If the licensee has any unusual aspect of its work with installed gauges, review and evaluate compliance with regulatory requirements. If the licensee conducts licensed activities at locations other than the one being audited, consider the deficiencies identified at the other locations and ensure that the corrective actions implemented in response to those deficiencies have in fact been implemented at the audited locations.
19. Continuation of Report Items.
This section is self-explanatory.
20. Problems or Deficiencies Noted, Recommendations.
This section is self-explanatory.
21. Evaluation of Other Factors.
Evaluate management's involvement with the radiation protection program, whether the RSO has sufficient time to perform their duties, and whether the licensee has sufficient staff to handle the workload and maintain compliance with regulatory requirements.

APPENDIX H
GEORGIA DEPARTMENT OF NATURAL RESOURCES
RADIOACTIVE MATERIALS PROGRAM
REQUEST TO TERMINATE RADIOACTIVE MATERIAL LICENSE

1. Licensee Name _____ 2. License Number _____

3. Address _____
No. Street/ P. O. Box No. City, State Zip code

4. Contact Person _____ 5. Telephone Number _____

6. Request is hereby made that the Radioactive Material License described above be terminated for the following reason:

7. Radioactive Material possessed under this license has been disposed of as indicated below:

No materials have been possessed or procured by the licensee under this licensee.

All material was used for the licensed purposes; none remains.

All material was leased, and has been returned to lessor.

Name of lessor: _____ License No. _____

Lessor acknowledgement of receipt attached.

Material has been transferred to the following licensee:

Licensee Name _____ License No. _____

Address _____
No. Street/ P. O. Box No. City, State Zip code

Date of transfer: _____

Transferee acknowledgement of receipt attached.

Material has been disposed of in the following manner:

A radiation survey was conducted to confirm the absence of radioactive material and to determine whether any contamination remains at the facility covered by the license.

Copy of survey results attached.

8. Management Official or Radiation Safety Officer

Signature of certifying officer Date _____

Print name Title _____

Keep one copy for your records and send original to:

GEORGIA DEPARTMENT OF NATURAL RESOURCES
RADIOACTIVE MATERIALS PROGRAM
4220 INTERNATIONAL PARKWAY, SUITE 100

APPENDIX I
GUIDANCE FOR GAS CHROMATOGRAPHS (GC) USE ONLY

This Appendix to the Licensing Guide for Installed Gauges and Gas Chromatography is provided to assist users of gas chromatography devices to prepare a license application. These devices are used to sample a variety of material. They are well-designed units that represent very little hazard to the public. As a result, the information required for authorization to use one of these devices is not extensive. This appendix describes the type of information that the Department needs to evaluate an application for a license for sealed sources in gas chromatography devices.

Contents of an Application

(Refer to Section III of the Licensing Guide)

Items 1-4. Please respond to as stated in Licensing Guide.

Item 5. Radioactive Material

1. Identify the radioisotope, the manufacturer's model number of the foil source, plated source or sealed source, and the maximum activity per source that will be used in the gas chromatography device.
2. Identify the manufacturer's name and model number of the detector cell that will be used in the gas chromatography device.
For example: Ni-63, foil source, Amersham Model Number 123, 20 millicuries

NOTE: Consult with the proposed supplier for this information to be sure that the sources, devices, and source-device combination(s) conform to the sealed source and device designations registered with the NRC or an Agreement State. Improperly identified equipment may require additional correspondence and may slow the review process.

Item 6. Purposes For Which Licensed Material Will Be Used

Specify the purposes for which the devices you want to possess will be used.

Item 7. Individual Responsible For Radiation Safety Program And Their Training and Experience

State the name of the person designated by, and responsible to, the applicant's management as Radiation Safety Officer (RSO). This individual who maintains the license and associated records is responsible for the management and coordination of the Radiation Protection Program. In most instances, this individual is the contact person for the applicant in answering any questions or concerns about the license.

The RSO should have a high school diploma or a general equivalency diploma (GED) as well as the training you will require of the users as described in your response to Item 8. below.

Provide a copy of an organizational chart that shows the organizational structure as it relates to the RSO position to demonstrate that the RSO has sufficient independence and direct communication with responsible management officials. The chart should also show the position of the individual who signs the application in Item 13. of the Application Form.

Item 8. Training Provided To Other Users

If you do not propose to perform any maintenance or repair on the gas chromatography device, no specific training and experience in the use and handling of radioactive material is necessary for individuals who will use it or supervise its use. No specific training or experience is needed to perform leak test using a leak-test kit or to clean detector cells used in the GC devices provided to source or foil is not removed from the detector cells. The only training required would be in the proper handling of the GC device.

If you propose to perform any operations that involve removal of the source from the devices or maintenance and repair of a device that involved the source, only a “responsible individual” may perform these operations. This “responsible individual” must have received instruction and training in the principles and practices of radiation safety, the use of radiation detection instruments and the performance of these operations.

Item 9. Facilities and Equipment

Please respond to as stated in Licensing Guide.

Item 10. Radiation Safety Program

For gas chromatography, the procedure for cleaning detector cells and/or removal and exchange of the foil or plated source should be provided. The applicant may specify that detector cells will be returned to the manufacturer for cleaning or servicing. If the applicant will perform in-house cleaning or servicing, the manufacturer’s recommended procedures should be followed and a copy of the procedures should be submitted with the application. If detector cells containing Hydrogen-3 will be used, the applicant should provide for venting of the detector cells. The procedure for venting should be specified in the application.

Item 10.1. Personnel Monitoring Program

Users of these devices exhibiting low radiation levels at the surface of the device are not usually required to wear personnel monitoring devices. However, if you intend to perform extended maintenance on the devices, personnel monitoring should be used.

Item 10.2. Radiation Detection Instruments

Radiation detection instruments such as survey meters are not normally required if the applicant plans only to use the devices for their intended use and does not plan to perform maintenance on the devices involving access to the sources and source holders. However, if the applicant does intend to perform maintenance, the survey instrument(s) that will be available to the site where maintenance will be performed should be specified.

Items 10.3-10.6. Please respond to as stated in Licensing Guide.

Items 10.7-10.9. Not applicable

Item 11–13. Please respond to as stated in Licensing Guide.

Appendix J

INCREASED CONTROLS QUANTITIES OF CONCERN

The following table contains a list of radionuclides of quantities of concern which will be subject to the increased controls requirements. If your licensed activity requires radioactive source(s) as a single or sources located together (collocated) that may meet or exceed the quantities listed in the table below, please contact the Department for further information and direction.

| Radionuclide | Quantity of Concern ¹ (TBq) | Quantity of Concern ² (Ci) |
|---|--|---------------------------------------|
| Am-241 | 0.6 | 16 |
| Am-241/Be | 0.6 | 16 |
| Cf-252 | 0.2 | 5.4 |
| Cm-244 | 0.5 | 14 |
| Co-60 | 0.3 | 8.1 |
| Cs-137 | 1 | 27 |
| Gd-153 | 10 | 270 |
| Ir-192 | 0.8 | 22 |
| Pm-147 | 400 | 11,000 |
| Pu-238 | 0.6 | 16 |
| Pu-239/Be | 0.6 | 16 |
| Se-75 | 2 | 54 |
| Sr-90 (Y-90) | 10 | 270 |
| Tm-170 | 200 | 5,400 |
| Yb-169 | 3 | 81 |
| Combinations of radioactive materials listed above ³ | See Footnote Below ⁴ | |

¹ The aggregate activity of multiple, collocated sources of the same radionuclide should be included when the total activity equals or exceeds the quantity of concern.

² The primary values used for compliance with this Order are TBq. The curie (Ci) values are rounded to two significant figures for informational purposes only.

³ Radioactive materials are to be considered aggregated or collocated if breaching a common physical security barrier (e.g., a locked door at the entrance to a storage room) would allow access to the radioactive material or devices containing the radioactive material.

⁴ If several radionuclides are aggregated, the sum of the ratios of the activity of each source, i of radionuclide, n , $A_{(i,n)}$, to the quantity of concern for radionuclide n , $Q(n)$, listed for that radionuclide equals or exceeds one. $[(\text{aggregated source activity for radionuclide A}) \div (\text{quantity of concern for radionuclide A})] + [(\text{aggregated source activity for radionuclide B}) \div (\text{quantity of concern for radionuclide B})] + \text{etc.} \dots \geq 1$

Use the following method to determine which sources of radioactive material require increased controls (ICs):

- Include any single source equal to or greater than the quantity of concern in Table 1
- Include multiple collocated sources of the same radionuclide when the combined quantity equals or exceeds the quantity of concern
- For combinations of radionuclides, include multiple collocated sources of different radionuclides when the aggregate quantities satisfy the following unity rule: $[(\text{amount of radionuclide A}) \div (\text{quantity of concern of radionuclide A})] + [(\text{amount of radionuclide B}) \div (\text{quantity of concern of radionuclide B})] + \text{etc.....} \geq 1$