NEBRASKA DEPARTMENT OF HEALTH AND HUMAN SERVICES
NOTICE OF PUBLIC HEARING

December 12, 2019
1:00 p.m. Central Time
Nebraska State Office Building – Lower Level A
301 Centennial Mall South, Lincoln, Nebraska

The purpose of this hearing is to receive comments on proposed changes to Title 180, Chapter 14 of the Nebraska Administrative Code (NAC) – *Radiation Safety Requirements for Well Logging and Subsurface Tracer Studies.* The chapter applies to all licensees who use radioactive material including sealed sources, radioactive tracers, radioactive markers, and uranium sinker bars in well logging. The proposed changes remove any duplicative statutory language and unnecessary language from the regulations and update formatting.

Authority for these regulations is found in Neb. Rev. Stat. § 81-3117(7).

Interested persons may attend the hearing and provide verbal or written comments or mail, fax or email written comments, no later than the day of the hearing to: DHHS Legal Services, PO Box 95026, Lincoln, NE 68509-5026, (402) 742-2382 or dhhs.regulations@nebraska.gov, respectively.

A copy of the proposed changes is available online at http://www.sos.ne.gov, or by contacting DHHS at the mailing address or email above, or by phone at (402) 471-8417. The fiscal impact statement for these proposed changes may be obtained at the office of the Secretary of State, Regulations Division, 1201 N Street, Suite 120, Lincoln, NE 68508, or by calling (402) 471-2385.

Auxiliary aids or reasonable accommodations needed to participate in a hearing can be requested by calling (402) 471-8417. Individuals with hearing impairments may call DHHS at (402) 471-9570 (voice and TDD) or the Nebraska Relay System at 711 or (800) 833-7352 TDD at least 2 weeks prior to the hearing.

FISCAL IMPACT STATEMENT

Please check one.
☐ **Draft** ☒ **Final**

Has this statement been reviewed & approved by FAPA Unit (MLTC & CFS) or Budget Unit (PH)? ☒ **Yes** ☐ **No**

Agency: **Department of Health and Human Services**	
Title: 180	Prepared by: Julia Schmitt
Chapter: 14	Date prepared:06/04/2019
Subject: Radiation Safety Requirements for Well Logging and Subsurface Tracer Studies	Telephone: 402/471-0528

Type of Fiscal Impact:

Please check all that apply

	State Agency	Political Sub.	Regulated Public
No Fiscal Impact	(☒)	(☒)	(☒)
Increased Costs	(☐)	(☐)	(☐)
Decreased Costs	(☐)	(☐)	(☐)
Increased Revenue	(☐)	(☐)	(☐)
Decreased Revenue	(☐)	(☐)	(☐)
Indeterminable	(☐)	(☐)	(☐)

Provide an Estimated Cost & Description of Impact:

State Agency:

Political Subdivision:

Regulated Public:

If indeterminable, explain why:

TITLE 180 CONTROL OF RADIATION

CHAPTER 14 RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING AND SUBSURFACE TRACER STUDIES

001. SCOPE AND AUTHORITY. This chapter establishes radiation safety requirements for persons using sources of radiation in well logging and subsurface tracer operations. This chapter applies to all licensees who use radioactive material including sealed sources, radioactive tracers, radioactive markers, and uranium sinker bars in well logging in a single well. These regulations are authorized and implemented by the Nebraska Radiation Control Act, Nebraska Revised Statute (Neb. Rev. Stat.) §§ 71-3501 to 71-3520. The provisions and requirements of this chapter are in addition to, and not in substitution for, other requirements of these regulations. The provisions of 180 Nebraska Administrative Code (NAC) 1, 2, 3, 4, 10, 13, 15 and 18 apply to applicants and licensees subject to this chapter.

001.01 40 CODE OF FEDERAL REGULATIONS (CFR). 40 CFR were published July 1, 2002 are referred throughout this chapter and incorporated by reference and available for viewing at the Department of Health and Human Services, Radiological Health, 301 Centennial Mall South, 3rd Floor, Lincoln, Nebraska 68509.

001.02 AMERICAN NATIONAL STANDARD INSTITUTE (ANSI) N43.6 AND UNITED STATES OF AMERICA STANDARD INSTITUTE (USASI) N 5.10-1968. The American National Standard Institute (ANSI) N43.6 and United States of America Standard Institute (USASI) N 5.10-1968 are referred to throughout this chapter and incorporated by reference and available for viewing at the Department of Health and Human Services, Radiological Health, 301 Centennial Mall South, 3rd Floor, Lincoln, Nebraska 68509.

002. DEFINITIONS. The following definitions apply to this chapter:

002.01 ENERGY COMPENSATION SOURCE (ECS). An energy compensation source (ECS) is a small sealed source, with an activity not exceeding 3.7 megabecquerels (MBq) or 100 microcuries (µCi), used within a logging tool, or other tool components, to provide a reference standard to maintain the tool's calibration when in use.

002.02 FIELD STATION. A field station is a facility where radioactive sources may be stored or used and from which equipment is dispatched to temporary jobsites.

002.03 FRESH WATER AQUIFER. A fresh water aquifer is a geologic formation that is capable of yielding fresh water to a well or spring, except those aquifers exempted according to 40 Code of Federal Regulations 122.35.

002.04 INJECTION TOOL. An injection tool is a device used for controlled subsurface injection of radioactive tracer material.

002.05 IRRETRIEVABLE WELL LOGGING SOURCE. An irretrievable well logging source is any sealed source containing radioactive material that is pulled off or not connected to the wireline that suspends the source in the well and for which all reasonable effort at recovery has been expended.

002.06 LOGGING ASSISTANT. A logging assistant is any individual who, under the personal supervision of a logging supervisor, handles sealed sources or tracers that are not in logging tools or shipping containers or who performs surveys required by 180 NAC 14-020.

002.07 LOGGING SUPERVISOR. A logging supervisor is an individual who uses radioactive material or provides personal supervision in the use of radioactive material at a temporary jobsite and who is responsible to the licensee for assuring compliance with the requirements of the regulations and the conditions of the license.

002.08 LOGGING TOOL. A logging tool is a device used subsurface to perform well logging.

002.09 PERSONAL SUPERVISION. Personal supervision is guidance and instruction by a logging supervisor, who is physically present at a temporary jobsite, in personal contact with logging assistants, and can give immediate assistance.

002.10 RADIOACTIVE MARKER. A radioactive marker is radioactive material used for depth determination or direction orientation. This includes radioactive collar markers and radioactive iron nails.

002.11 SAFETY REVIEW. A safety review is a periodic review provided by the licensee for its employees on radiation safety aspects of well logging. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, accidents or errors that have been observed, and opportunities for employees to ask safety questions.

002.12 SOURCE HOLDER. A source holder is a housing or assembly into which a sealed source is placed to facilitate the handling and use of the source in well logging.

002.13 SUBSURFACE TRACER STUDY. A subsurface tracer study is the release of unsealed radioactive material or a substance labeled with radioactive material in a single well for the purpose of tracing the movement or position of the material or substance in the well or adjacent formation.

002.14 SURFACE CASING FOR PROTECTING FRESH WATER AQUIFERS. Surface casing for protecting fresh water aquifers is a pipe or tube used as a lining in a well to isolate fresh water aquifers from the well.

002.15 TEMPORARY JOBSITE. A temporary jobsite is a place where radioactive materials are present for the purpose of performing well logging or subsurface tracer studies.

002.16 TRITIUM NEUTRON GENERATOR TARGET SOURCE. A tritium neutron generator target source is a tritium source used within a neutron generator tube to produce neutrons for use in well logging applications.

002.17 URANIUM SINKER BAR. A uranium sinker bar is a weight containing depleted uranium used to pull a logging tool toward the bottom of a well.

002.18 WELL. A well is a drilled hole in which well logging may be performed. The term well includes drilled holes for the purpose of oil, gas, mineral, groundwater, or geological exploration.

002.19 WELL LOGGING. Well logging is all operations involving the lowering and raising of measuring devices or tools which contain radioactive material or are used to detect radioactive materials in wells for the purpose of obtaining information about the well or adjacent formations which may be used in oil, gas, mineral, groundwater, or geological exploration.

003. SPECIFIC LICENSES FOR WELL LOGGING. The following applies to well logging license applicants.

003.01 APPLICATION. An applicant for a specific license for the use of licensed material in well logging must meet the following requirements.

(A) Satisfy the general requirements specified in 180 NAC 3-011, for radioactive material, in 180 NAC 3-015 for source material and any special requirements contained in 180 NAC 14.

(B) Develop a program for training logging supervisors and logging assistants and submit a description of this program which specifies:

(i) Initial training;

(ii) On-the-job training;

(iii) Annual safety reviews provided by the licensee;

(iv) Means the applicant will use to demonstrate the logging supervisor's knowledge and understanding of and ability to comply with the Department's regulations and licensing requirements and the applicant's operating and emergency procedures; and

(v) Means the applicant will use to demonstrate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures.

(C) Submit written operating and emergency procedures as described in this chapter, 180 NAC 14-018 or an outline or summary of the procedures that includes the important radiation safety aspects of the procedures.

(D) Establish and submit its program for annual inspections of the job performance of each logging supervisor to ensure that the Department's regulations, license requirements, and the applicant's operating and emergency procedures are followed. Inspection records must be retained for 3 years after each annual internal inspection.

(E) Submit a description of its overall organizational structure as it applies to the radiation safety responsibilities in well logging, including specified delegations of authority and responsibility.

(F) If an applicant wants to perform leak testing of sealed sources, the applicant must identify the manufacturers and the model numbers of the leak test kits to be used. If

the applicant wants to analyze its own wipe samples, the applicant must establish procedures to be followed and submit a description of these procedures. The description must include the:

(i) Instruments to be used;

(ii) Methods of performing the analysis; and

(iii) Pertinent experience of the person who will analyze the wipe samples.

004. AGREEMENT WITH WELL OWNER OR OPERATOR. The licensee must have an agreement with the well owner or operator as specified below.

004.01 WRITTEN AGREEMENT. A licensee may perform well logging with a sealed source only after the licensee has a written agreement with the employing well owner or operator. This written agreement must identify who will meet the following requirements:

(A) If a sealed source becomes lodged in the well, a reasonable effort will be made to recover it;

(B) A person may not attempt to recover a sealed source in a manner which, in the licensee's opinion, could result in its rupture;

(C) The radiation monitoring required in 180 NAC 14-021.01 will be performed;

(D) If the environment, any equipment, or personnel are contaminated with radioactive material, they must be decontaminated before release from the site or release for unrestricted use; and

(E) If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the following requirements must be implemented within 30 days:

(i) Each irretrievable well logging source must be immobilized and sealed in place with a cement plug;

(ii) A means to prevent inadvertent intrusion on the source, unless the source is not accessible to any subsequent drilling operations; and

(iii) A permanent identification plaque, constructed of long lasting material such as stainless steel, brass, bronze, or monel, must be mounted at the surface of the well, unless the mounting of the plaque is not practical. The size of the plaque must be at least 17 centimeters (7 inches) square and 3 millimeters (1/8 inch) thick. The plaque must contain:

(1) The word "Caution"

(2) The radiation symbol. The color requirement in 180 NAC 4-033.01 need not be met;

(3) The date the source was abandoned;

(4) The name of the well owner or well operator as appropriate;

(5) The well name and well identification number or numbers or other designation;

(6) An identification of the sealed source or sources by radionuclide and quantity;

(7) The depth of the source and depth to the top of the plug; and

(8) An appropriate warning with similar wording as "DO NOT RE-ENTER THIS WELL".

(iv) If a radioactive source is classified as irretrievably lost in any well or test hole, the licensee must, within 15 days, file with the Register of Deeds of the County in which the well or test hole is located, a map of the location, including the legal description where the source was irretrievably lost, and a statement identifying

the type and quantity of the radioactive source. Certified copies of the filing must be submitted to the Department within 30 days of the filing.

004.02 WRITTEN AGREEMENT RETENTION. The licensee must retain a copy of the written agreement for three years after the completion of the well logging operation.

004.03 DRILLING SAFETY ZONE. If a radioactive source is irretrievably lost in a fresh water aquifer or down a liquefied petroleum products storage cavity, the establishment of a drilling safety zone, based upon review of the geology and hydrology of the site, must be sought from the Department. All wells and storage cavities in the drilling safety zone must be abandoned and no fluids may be removed except upon approval by the Department. In addition of the notice requirements in 180 NAC 14-004.01(E), within 15 days after receipt of notice of the establishment of a drilling safety zone by the Department, the licensee must prepare a map of the drilling safety zone indicating the type and quantity of radioactive source, and the map must be filed with the Register of Deeds of any County which forms a portion of the drilling safety zone. Certified copies of the filing must be submitted to the Department within 30 days after the filing.

004.04 EXCEPTION. A written agreement between the licensee and the well owner or operator is not required if the licensee and the well owner or operator are part of the same corporate structure or otherwise similarly affiliated. However, the licensee must still otherwise meet the requirements in 180 NAC 14-004.01 (A) through (E).

005. LABELS, SECURITY AND TRANSPORTATION PRECAUTIONS. This section addresses labels, security and transportation precautions.

005.01 LABELS. Licensees must not:

(A) Use a source, source holder, or logging tool that contains radioactive material unless the smallest component that is transported as a separate piece of equipment with the radioactive material inside bears a durable, legible, and clearly visible marking or label. The marking or label must contain the radiation symbol specified in 180 NAC 4-033.01, without the conventional color requirements, and the wording:

CAUTION or DANGER
RADIOACTIVE MATERIAL

(B) Use a container to store radioactive material unless the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the radiation symbol specified in and the wording:

CAUTION or DANGER
RADIOACTIVE MATERIAL
NOTIFY CIVIL AUTHORITIES or NAME OF COMPANY

(C) Transport radioactive material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers in accordance with 180 NAC 13.

005.02 SOURCE SECURITY, STORAGE AND TRANSPORTATION. Licenses must:

(A) Store each source containing radioactive material in a storage container or transportation package. The container or package must be locked and physically secured to prevent tampering or removal of radioactive material from storage by unauthorized personnel. The licensee must store radioactive material in a manner that will minimize danger from explosion or fire;
(B) Lock and physically secure the transport package containing radioactive material in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal of the radioactive material from the vehicle.

006. RADIATION SURVEY INSTRUMENTS. The licensee must use radiation survey instruments that meet the following requirements.

006.01 SURVEY INSTRUMENTS AT FIELD STATIONS AND TEMPORARY JOB SITES. The licensee must keep a calibrated and operable radiation survey instrument capable of detecting beta and gamma radiation at each field station and temporary jobsite to make the radiation surveys required by this chapter and 180 NAC 4. To satisfy this requirement, the radiation survey instrument must be capable of measuring 0.001 millisievert (mSv) (0.1 millirem (mrem) per hour through at least 0.5 mSv (50 mrem) per hour.

006.02 ADDITIONAL SURVEY INSTRUMENTS. The licensee must have available additional calibrated and operable radiation survey instruments sensitive enough to detect the low radiation and contamination levels that could be encountered if a sealed source ruptured. The licensee may own the instruments or may have a procedure to obtain them quickly from a second party.

006.03 CALIBRATION REQUIREMENTS. The licensee must ensure that each radiation survey instrument required under 180 NAC 14-006.01 is calibrated:
(A) At intervals not to exceed six months and after instrument servicing;
(B) At two points located approximately 1/3 and 2/3 of full scale on each scale for linear scale instruments; at midrange of each decade and at two points of at least one decade for logarithmic scale instruments; and at approximate points for digital instruments;
(C) So that an accuracy within plus or minus 20% of the calibration standard can be demonstrated on each scale; and
(D) At energies and radiation levels appropriate for use.

006.04 RECORDS. The licensee must retain calibration records for a period of three years after the date of calibration for inspection by the Department.

007. LEAK TESTING OF SEALED SOURCES. This section addresses leak testing of sealed sources.

007.01 TEST FOR LEAKAGE. Each licensee using sealed sources of radioactive material must have the sources tested for leakage. Records of leak test results must be kept in units of microcuries and maintained for inspection by the Department.

007.02 METHOD OF TESTING. The wipe of a sealed source must be performed using a leak test kit or method approved by the Department, the U.S. Nuclear Regulatory Commission, or

another Agreement State. The wipe sample must be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample must be analyzed for radioactive contamination. The analysis must be capable of detecting the presence of 185 becquerel (Bq) (0.005 µCi) of radioactive material on the test sample and must be performed by a person approved by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State to perform the analysis.

007.03 FREQUENCY. Leak testing must be performed at the following intervals:

(A) Each sealed source except an energy compensation source (ECS) must be tested at intervals not to exceed six months. In the absence of a certificate from a transferor that a test has been made within the six months before the transfer, the sealed source may not be used until tested.

(B) Each energy compensation source (ECS) that is not exempt from testing in accordance with 180 NAC 14-007.05 must be tested at intervals not to exceed three years. In the absence of a certificate from a transferor that a test has been made within the three years before the transfer, the energy compensation source (ECS) may not be used until tested.

007.04 DECONTAMINATION AND REPORTING OF LEAKING SOURCES. Licensees must remove leaking sources from service and report to the Department as follows.

(A) If the test conducted according to 180 NAC 14-007.01 and 007.02 reveals the presence of 185 Bq (0.005 µCi) or more of removable radioactive material, the licensee must remove the sealed source from service immediately and have it decontaminated, repaired, or disposed of by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State licensee that is authorized to perform these functions. The licensee must check the equipment associated with the leaking source for radioactive contamination and, if contaminated, have it decontaminated or disposed of by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State licensee that is authorized to perform these functions.

(B) The licensee must submit a report to the Department within five days of receiving the test results. The report must describe the equipment involved in the leak test, the test results, any contamination which resulted from the leaking source, and the corrective actions taken up to the time the report is made.

007.05 EXEMPTIONS FROM TESTING REQUIREMENTS. The following sealed sources are exempt from the periodic leak test requirements in 180 NAC 14-007.01 through 007.04:

(A) Hydrogen-3 (tritium) sources;

(B) Sources containing radioactive material with a half-life of 30 days or less;

(C) Sealed sources containing radioactive material in gaseous form;

(D) Sources of beta or gamma emitting radioactive material with an activity of 3.7 MBq (100 µCi) or less; and

(E) Sources of alpha or neutron emitting radioactive material with an activity of 0.37 MBq (10 µCi) or less.

008. PHYSICAL INVENTORY. Each licensee must conduct quarterly physical inventory to account for all radioactive material received and possessed under the license. The licensee must retain records of the inventory for three years from the date of the inventory for inspection by the

Department. The inventory must indicate the quantity and kind of radioactive material, the location of the radioactive material, the date of the inventory, and the name of the individual conducting the inventory. Physical inventory records may be combined with leak test records

009. RECORDS OF MATERIAL USE. Records of use must be maintained by the licensee.

009.01 RECORD REQUIREMENTS. Each licensee must maintain records for each use of radioactive material showing:

(A) The make, model number, and a serial number or a description of each sealed source used;

(B) In the case of unsealed radioactive material used for subsurface tracer studies, the radionuclide and quantity of activity used in a particular well and the disposition of any unused tracer materials;

(C) The identity of the logging supervisor who is responsible for the radioactive material and the identity of logging assistants present; and

(D) The location and date of use of the radioactive material.

009.02 RECORD RETENTION. The licensee must make the records required by 180 NAC 14-009.01 available for inspection by the Department. The licensee must retain the records for three years from the date of the recorded event.

010. DESIGN, PERFORMANCE CRITERIA FOR SEALED SOURCES. The design and performance criteria for sealed sources are as follows.

010.01 SEALED SOURCE USE. A licensee may use a sealed source for use in well logging application if:

(A) The sealed source is doubly encapsulated;

(B) The sealed source contains radioactive material whose chemical and physical forms are as insoluble and nondispersible as practical; and

(C) Meets the requirements in 180 NAC 14-010.02, 010.03, or 010.04.

010.02 SEALED SOURCES MANUFACTURED ON OR BEFORE JULY 14, 1989. For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source, for use in well logging applications if it meets the requirements of US America Standards Institute (ASI) N5.10-1968, “Classification of Sealed Radioactive Sources”, or the requirements in 180 NAC 14-010.03 and 010.04.

010.03 SEALED SOURCES MANUFACTURED AFTER JULY 14, 1989. For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications if it meets the oil-well logging requirements of America Standards Institute (ANSI)/HPS N43.6-1997, “Sealed Radioactive Sources - Classification.”

010.04 ADDITIONAL REQUIREMENTS FOR SEALED SOURCES MANUFACTURED AFTER JULY 14, 1989. For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications, if:

(A) The sealed source’s prototype has been tested and found to maintain its integrity after each of the following tests:

(i) Temperature. The test source must be held at -40°Celsius (-40°Fahrenheit) for 20 minutes, 600°Celsius (1112°Fahrenheit) for 1 hour, and then be subject to a thermal shock test with a temperature drop from 600°Celsius (1112°Fahrenheit) to 20°Celsius (68°Fahrenheit) within 15 seconds

(ii) Impact test. A 5 kilogram (kg) steel hammer, 2.5 centimeters (cm) in diameter, must be dropped from a height of 1 meter (m) onto the test source.

(iii) Vibration test. The test source must be subject to a vibration from 25 hertz (Hz) to 500 hertz (Hz) at 5 G amplitude for 30 minutes.

(iv) Puncture test. A 1 gram (gm) hammer and pin, 0+.3 cm pin diameter, must be dropped from a height of 1 m onto the test source.

(v) Pressure test. The test source must be subjected to an external pressure of 1.695E+7 pascals (24,600 pounds per square inch absolute).

010.05 EXEMPTIONS. The requirements in 180 NAC 14-010.01, 010.02, 010.03 and 010.04 do not apply to sealed sources that contain radioactive material in gaseous form.

010.06 ENERGY COMPENSATION SOURCE EXEMPTIONS. The requirements in 180 NAC 14-010.01, 010.02, 010.03 and 010.04 do not apply to energy compensation sources (ECS). ECSs must be registered with the U.S. Nuclear Regulatory Commission under 10 Code of Federal Regulations 32.210 or with an Agreement State.

011. INSPECTION MAINTENANCE AND OPENING OF A SOURCE OR SOURCE HOLDER. Licensees must inspect and maintain sealed sources.

011.01 SOURCE HOLDERS, LOGGING TOOLS AND SOURCE HANDLING TOOLS. Each licensee must visually check source holders, logging tools, and source handling tools, for defects before each use to ensure that the equipment is in good working condition and that required labeling is present. If defects are found, the equipment must be removed from service until repaired and a record must be made listing: the date of check, name of inspector, equipment involved, defects found, and repairs made. These records must be retained for three years after the defect is found.

011.02 VISUAL INSPECTION AND ROUTINE MAINTENANCE PROGRAM. Each licensee must conduct, at intervals not to exceed six months, a program of visual inspection and routine maintenance of source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling is legible and that no physical damage is visible. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing: date, equipment involved, inspection and maintenance operations performed, any defects found, and any actions taken to correct the defects. These records must be retained for three years after the defect is found.

011.03 SEALED SOURCE REMOVAL PROCEDURES. Removal of a sealed source from a source holder or logging tool, and maintenance on sealed sources or holders in which sealed sources are contained may not be performed by the licensee unless a written procedure according to 180 NAC 14-018 has been developed by the licensee and approved by the Department based upon compliance with 180 NAC 4 and 10.

011.04 STUCK SEALED SOURCE. If a sealed source is stuck in the source holder, the licensee may not perform any operation on the source holder, such as drilling, cutting, or chiseling, unless the licensee is specifically approved by the Department; approval is based upon training and experience of the licensee and upon compliance with 180 NAC 4 and 10.

011.05 OPENING OF SEALED SOURCES. The opening, repair, or modification of any sealed source must be performed by persons specifically approved to do so by the Department, U.S. Nuclear Regulatory Commission, or an Agreement State.

012. SUBSURFACE TRACER STUDIES. Licensees performing subsurface tracer studies must meet the following requirements.

012.01 PERSONNEL PROTECTION. The licensee must require all personnel handling radioactive tracer material to use protective gloves and, if required by the licensee, other protective clothing and equipment. The licensee must take precautions to avoid ingestion or inhalation of radioactive tracer material and to avoid contamination of field stations and temporary jobsites.

012.02 LIMITATIONS. A licensee may not knowingly inject radioactive material into fresh water aquifers.

013. URANIUM SINKER BARS. The licensee may use a uranium sinker bar in well logging applications only if it is legibly impressed with the words "CAUTION - RADIOACTIVE - DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND".

014. SEALED SOURCE. Use of a sealed source in wells with and without casings must meet the following requirements.

014.01 WELL WITH A SURFACE CASING. No sealed source may be used in any well unless the well is cased according to the rules and regulations of the Nebraska Oil and Gas Conservation Commission Title 267 Chapter 3, 012.01 through 012.03 and 012.09 and Chapter 4, 006.01B, except as according to 180 NAC 14-014.02.

014.02 WELL WITHOUT A SURFACE CASING. The licensee may use a sealed source in a well without a surface casing for protecting fresh water aquifers only if the licensee follows a procedure for reducing the probability of the source becoming lodged in the well. The procedure must be approved by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State.

015. ENERGY COMPENSATION SOURCE. The licensee may use an energy compensation source (ECS) which is contained within a logging tool, or other tool components, only if the energy compensation source (ECS) contains quantities of licensed material not exceeding 3.7 MBq (100 µCi):

015.01 WELL WITH A SURFACE CASING. Well logging applications with a surface casing for protecting fresh water aquifers, use of the energy compensation source (ECS) is only subject to the requirements of 180 NAC 14-007, 008 and 009.

015.02 WELL WITHOUT A SURFACE CASING. Well logging applications without the surface casing for protecting fresh water aquifers, use of the energy compensation source (ECS) is only subject to the requirements of 180 NAC 14-004, 007, 008, 009, 014 and 027.

016. TRITIUM NEUTRON GENERATOR TARGET SOURCE. The use of tritium neutron generator target sources in wells with and without surface casings must meet the following requirements.

016.01 WELL WITH A SURFACE CASING. Use of a tritium neutron generator target source, containing quantities not exceeding 1,110 MBq (30 curies) and in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of this chapter except 180 NAC 14-004, 010 and 027.

016.02 WELL WITHOUT A SURFACE CASING. Use of a tritium neutron generator target source, containing quantities exceeding 1,110 MBq (30 curies) or in a well without a surface casing to protect fresh water aquifers, is subject to the requirements of this chapter except 180 NAC 14-010.

017. TRAINING AND EXPERIENCE QUALIFICATION REQUIREMENTS FOR WELL LOGGING PERSONNEL. The following requirements apply to well logging personnel:

017.01 RADIATION SAFETY OFFICER. A radiation safety officer must:

(A) Have a college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering;

(B) Be qualified as well logger or have six weeks on-the-job training under an authorized user; and

(C) Have forty hours of formal instruction in:

(i) Principles and practices of radiation protection;

(ii) Radioactivity measurements standardization and monitoring techniques and instruments;

(iii) Mathematics and calculations basic to the use of and measurement of radioactivity;

(iv) Biological effects of radiation; and

(v) Operating and emergency procedures and federal and state radiation control regulations.

017.02 LOGGING SUPERVISOR REQUIREMENTS. The licensee must not permit an individual to act as a logging supervisor until that person has:

(A) Completed forty hours of formal training in the subjects outlined in 180 NAC 14-017.06;

(B) Received copies of, and instruction in:

(i) 180 NAC 4, 10, and 14;

(ii) The license under which the logging supervisor will perform well logging; and

(iii) The licensee's operating and emergency procedures required by 180 NAC 14-019;

(C) Completed six weeks of on-the-job training under a logging supervisor and demonstrated competence in the use of radioactive materials, remote handling tools, and radiation survey instruments by a field evaluation; and

(D) Demonstrated understanding of the requirements in 180 NAC 14-017.02(A) and (B) by successfully completing a written test.

017.03 LOGGING SUPERVISOR REQUIREMENTS. The licensee must not permit an individual to act as a logging assistant until that person has:

(A) Received instruction in applicable parts of 180 NAC 4, and 10;

(B) Received copies and instruction in, the licensee's operating and emergency procedures required by 180 NAC 14-018;

(C) Demonstrated understanding of the materials listed in 180 NAC 14-017.03(A) and (B) by successfully completing the test; and

(D) Received instruction in the use of radioactive materials, remote handling tools, and radiation survey instruments, as appropriate for the logging assistant's intended job responsibilities.

017.04 SAFETY REVIEW. The licensee must provide safety reviews for logging supervisors and logging assistants at least once during each calendar year.

017.05 RECORD RETENTION. The licensee must maintain a record on each logging supervisor's and logging assistant's training and annual safety review. The training records must include copies of written tests and dates of oral tests. The training records must be retained for three years following the termination of employment. Records of annual safety reviews must list the topics discussed and be retained for three years.

017.06 TRAINING SUBJECTS REQUIRED. The following topics must be included in the training required by 180 NAC 14-017.02:

(A) Fundamentals of radiation safety including:

(i) Characteristics of radiation;

(ii) Units of radiation dose and quantity of radioactivity;

(iii) Hazards of exposure to radiation;

(iv) Levels of radiation from radioactive material;

(v) Methods of controlling radiation dose (time, distance, and shielding); and

(vi) Radiation safety practices, including prevention of contamination, and methods of decontamination; and

(B) Radiation detection instruments including:

(i) Use, operation, calibration, and limitations of radiation survey instruments;

(ii) Survey techniques; and

(iii) Use of personnel monitoring equipment; and

(C) Equipment to be used including:

(i) Operation of equipment, including source handling equipment and remote handling tools;

(ii) Storage, control, and disposal of radioactive material; and

(iii) Maintenance of equipment; and

(D) The requirements of pertinent regulations; and

(E) Case histories of accidents in well logging.

018. OPERATING AND EMERGENCY PROCEDURES. Each licensee must develop and follow written operating and emergency procedures that cover:

(A) The handling and use of radioactive materials including the use of sealed sources in wells without surface casing for protecting fresh water aquifers, if appropriate;
(B) The use of remote handling tools for handling sealed sources and radioactive tracer material except low-activity calibration sources;
(C) Methods and occasions for conducting radiation surveys, including surveys for detecting contamination, as required by 180 NAC 14-020.02 through 020.05.
(D) Minimizing personnel exposure including exposures from inhalation and ingestion of radioactive tracer materials;
(E) Methods and occasions for locking and securing stored radioactive materials;
(F) Personnel monitoring and the use of personnel monitoring equipment;
(G) Transportation of sources of radiation to field stations or temporary jobsites, packaging of sources of radiation for transport in vehicles, placarding of vehicles when needed, and physically securing sources of radiation in transport vehicles during transportation to prevent accidental loss, tampering or unauthorized removal;
(H) Picking up, receiving, and opening packages containing radioactive materials, in accordance with 180 NAC 4-038;
(I) For the use of tracers, decontamination of the environment, equipment, and personnel;
(J) Maintenance of records generated by logging personnel at temporary jobsites;
(K) The inspection and maintenance of sealed sources, source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars as required by 180 NAC 14-011;
(L) Actions to be taken if a sealed source is lodged in a well;
(M) Notifying proper persons in the event of an accident; and
(N) Actions to be taken if a sealed source is ruptured including actions to prevent the spread of contamination, to minimize inhalation and ingestion of radioactive materials, and actions to obtain suitable radiation survey instruments as required by 180 NAC 14-006.02.

019. PERSONNEL MONITORING. Licensees must monitor exposure to radiation as follows.

019.01 DOSIMETER REQUIREMENTS. The licensee may not permit an individual to act as a logging supervisor or logging assistant unless that person wears, at all times during the handling of licensed radioactive materials, a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. Each personnel dosimeter must be assigned and worn by only one individual. Film badges must be replaced at least monthly and other personnel dosimeters at least quarterly. After replacement, each personnel dosimeter must be promptly processed.

019.02 BIOASSAY SERVICES. The licensee must provide bioassay services to individuals using radioactive materials in subsurface tracer studies if required by the license.

019.03 RECORD RETENTION. The licensee must retain records of personnel dosimeters required by 180 NAC 14-019.01 and bioassay results for inspection until the Department authorizes disposition of records.

020. RADIATION SURVEYS. Licensees must conduct surveys of radiation as follows.

020.01 RADIATION SURVEYS. The licensee must make radiation surveys, including but not limited to the surveys required in 180 NAC 14-020.02 through 020.05, of each area where radioactive materials are used and stored.

020.02 VEHICLE SURVEYS. Before transporting radioactive materials, the licensee must make a radiation survey of the position occupied by each individual in the vehicle and of the exterior of each vehicle used to transport the radioactive materials.

020.03 LOGGING TOOL. If the sealed source assembly is removed from the logging tool before departure from the temporary jobsite, the licensee must confirm that the logging tool is free of contamination by energizing the logging tool detector or by using a survey meter.

020.04 CONTAMINATION SURVEY. If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of sealed source could be damaged by the operation, the licensee must conduct a radiation survey, including a contamination survey, during and after the operation.

020.05 JOBSITE SURVEY. The licensee must make a radiation survey at the temporary jobsite before and after each subsurface tracer study to confirm the absence of contamination.

020.06 RECORD RETENTION. The results of surveys required in 180 NAC 14-020.01 through 020.05 must be recorded and must include the date of the survey, the name of the individual making the survey, the identification of the survey instrument used, and the location of the survey. The licensee must retain records of survey for inspection by the Department for three years after they are made.

021. RADIOACTIVE CONTAMINATION CONTROL. Licensees must monitor for leaking sealed sources and decontaminate areas as follows.

021.01 EMERGENCY PROCEDURES. If the licensee detects evidence that a sealed source has ruptured or radioactive materials have caused contamination, the licensee must immediately initiate the emergency procedures required by 180 NAC 14-018.

021.02 DECONTAMINATION. If contamination results from the use of radioactive material in well logging, the licensee must decontaminate all work areas, equipment, and unrestricted areas.

021.03 MONITOR CIRCULATING FLUIDS. During efforts to recover a sealed source lodged in the well, the licensee must continuously monitor, with an appropriate radiation detection instrument or a logging tool with a radiation detector, the circulating fluids from the well, if any, to check for contamination resulting from damage to the sealed source.

022. HANDLING TOOLS. The licensee must provide and require the use of tools that will assure remote handling of sealed sources other than low-activity calibration sources.

023. PARTICLE ACCELERATORS. No licensee or registrant may permit above-ground testing of particle accelerators designed for use in well logging, which results in the production of radiation, except in areas or facilities controlled or shielded so that the requirements of 180 NAC 4-005 and 4-013, as appropriate, are met.

024. SECURITY. Security of well logging sources must be maintained as follows.

024.01 PHYSICAL PRESENCE. A logging supervisor must be physically present at a temporary jobsite whenever radioactive material is being handled or are not stored and locked in a vehicle or storage place. The logging supervisor may leave the jobsite in order to obtain assistance if a source becomes lodged in a well.

024.02 DIRECT SURVEILLANCE. During well logging, except when radiation sources are below ground or in shipping or storage containers, the logging supervisor or other individual designated by the logging supervisor must maintain direct surveillance of the operation to prevent unauthorized entry into a restricted area, as defined 180 NAC 1-002.

025. DOCUMENTS AND RECORDS REQUIRED AT FIELD STATIONS: Each licensee must maintain the following documents and records at the field station:

(A) A copy of 180 NAC 4, 10 and 14;
(B) The license authorizing the use of radioactive material;
(C) Operating and emergency procedures required by 180 NAC 14-018;
(D) The record of radiation survey instrument calibrations required by 180 NAC 14-006;
(E) The record of leak tests required by 180 NAC 14-007;
(F) Physical inventory records required by 180 NAC 14-008;
(G) Utilization records required by 180 NAC 14-009;
(H) Records of inspection and maintenance required by 180 NAC 14-011;
(I) Training records required by 180 NAC 14-017; and
(J) Survey records required by 180 NAC 14-020.

026. DOCUMENTS AND RECORDS REQUIRED AT TEMPORARY JOBSITES: Each licensee conducting operations at a temporary jobsite must maintain the following documents and records at the temporary jobsite until the well logging operation is completed:

(A) Operating and emergency procedures required by 180 NAC 14-018;
(B) Evidence of latest calibration of the radiation survey instruments in use at the site required by 180 NAC 14-006;
(C) Latest survey records required by 180 NAC 14-020.02, 020.03 and 020.05;
(D) The shipping papers for the transportation of radioactive materials required by 180 NAC 13-005; and
(E) When operating under reciprocity according to 180 NAC 3-028, a copy of the U.S. Nuclear Regulatory Commission or Agreement State License authorizing use of radioactive materials.

027. NOTIFICATION OF INCIDENTS AND LOST SOURCES; ABANDONMENT PROCEDURES FOR IRRETRIEVABLE SOURCES. Licensees must meet notification and reporting requirements as follows.

027.01 RUPTURED SOURCE. The licensee must immediately notify the Department by telephone and subsequently, within 30 days, by confirmatory letter if the licensee knows or has reason to believe that a sealed source has been ruptured. The letter must designate the well or other location, describe the magnitude and extent of the escape of radioactive materials, assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences.

027.02 LOST SOURCES AND OTHER ACCIDENTS. The licensee must notify the Department of the theft or loss of radioactive materials, radiation overexposures, excessive levels and concentrations of radiation, and certain other accidents as required by 180 NAC 4-057, 4-058, 4-059 and 180 NAC 3-026.

027.03 ABANDONMENT OF IRRETRIEVABLE SOURCES. If a sealed source becomes lodged in a well, and when it becomes apparent that efforts to recover the sealed source will not be successful, the licensee must:

(A) Notify the appropriate Department by telephone of the circumstances that resulted in the inability to retrieve the source and
  (i) Obtain Department approval to implement abandonment procedures; or
  (ii) That the licensee implemented abandonment before receiving Department approval because the licensee believed there was an immediate threat to public health and safety; and
(B) Advise the well owner or operator, as appropriate, of the abandonment procedures under 180 NAC 14-004.01 and 004.03; and
(C) Ensure that either abandonment procedures are implemented within 30 days after the sealed source has been classified as irretrievable or request an extension of time if unable to complete the abandonment procedures.

027.04 REPORTING REQUIREMENTS. The licensee must, within 30 days after a sealed source has been classified as irretrievable, make a report in writing to the Department. The report must contain the following information:

(A) Date of occurrence;
(B) A description of the irretrievable well logging source involved including the radionuclide and its quantity, chemical, and physical form;
(C) Surface location and identification of the well;
(D) Results of efforts to immobilize and seal the source in place;
(E) A brief description of the attempted recovery effort;
(F) Depth of the source;
(G) Depth of the top of the cement plug;
(H) Depth of the well;
(I) The immediate threat to public health and safety justification for implementing abandonment if prior to Department approval was not obtained according to 180 NAC 14-027.03(A)(ii); and
(J) Any other information, such as a warning statement, contained on the permanent identification plaque.

EFFECTIVE DATE NOVEMBER 28, 2016 | NEBRASKA DEPARTMENT OF HEALTH AND HUMAN SERVICES | 180 NAC 14

TITLE 180 CONTROL OF RADIATION

CHAPTER 14 RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING AND SUBSURFACE TRACER STUDIES

Copies of the Code of Federal Regulations (CFR) cited in this Chapter are located at: http://www.gpoaccess.gov/cfr/index.html Removed table of contents

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TITLE 180 CONTROL OF RADIATION

CHAPTER 14 RADIATION SAFETY REQUIREMENTS FOR WELL LOGGING AND SUBSURFACE TRACER STUDIES:

14-001 SCOPE AND AUTHORITY

14-001.01 180 NAC 14 establishes radiation safety requirements for persons using sources of radiation in these operations. 180 NAC 14 applies to all licensees who use radioactive material including sealed sources, radioactive tracers, radioactive markers, and uranium sinker bars in well logging in a single well. The regulations are authorized by and implement the Nebraska Radiation Control Act, Neb. Stat. Rev. §§ 71-3501 to 71-3520.

14-001.02 The provisions and requirements of 180 NAC 14 are in addition to, and not in substitution for, other requirements of these regulations. In particular, the provisions of 180 NAC 1, 2, 3, 4, 10, 13, 15 17 and 18 apply to applicants and licensees subject to this Chapter.

14-001.03 40 CFR as published July 1, 2002 and referred throughout this Chapter is herein incorporated by reference and available for viewing at the Department of Health and Human Services, Radiological Health, 301 Centennial Mall South, 3rd Floor, Lincoln, Nebraska 68509.

14-001.04 American National Standard Institute (ANSI) ANSI N43.6 and United States of America Standard Institute (USASI) USASI N 5.10-1968 as referred to in this Chapter are herein incorporated by reference and available for viewing at the Department of Health and Human Services, Radiological Health, 301 Centennial Mall South, 3rd Floor, Lincoln, Nebraska 68509.

14-002 DEFINITIONS: As used in this Chapter, the following definitions apply:

Energy compensation source (ECS) means a small sealed source, with an activity not exceeding 3.7 MBq (100 microcuries), used within a logging tool, or other tool components, to provide a reference standard to maintain the tool's calibration when in use.

Field station means a facility where radioactive sources may be stored or used and from which equipment is dispatched to temporary jobsites.

Fresh water aquifer means a geologic formation that is capable of yielding fresh water to a well or spring, except those aquifers exempted pursuant to 40 CFR 122.35.

Injection tool means a device used for controlled subsurface injection of radioactive tracer material.

Irretrievable well logging source means any sealed source containing radioactive material that is pulled off or not connected to the wireline that suspends the source in the well and for which all reasonable effort at recovery has been expended.

Logging assistant means any individual who, under the personal supervision of a logging supervisor, handles sealed sources or tracers that are not in logging tools or shipping containers or who performs surveys required by 180 NAC 14-020.

Logging supervisor means an individual who uses radioactive material or provides personal supervision in the use of radioactive material at a temporary jobsite and who is responsible to the licensee for assuring compliance with the requirements of the regulations and the conditions of the license.

Logging tool means a device used subsurface to perform well logging.

Personal supervision means guidance and instruction by a logging supervisor, who is physically present at a temporary jobsite, who is in personal contact with logging assistants, and who can give immediate assistance.

Radioactive marker means radioactive material used for depth determination or direction orientation. This term includes radioactive collar markers and radioactive iron nails.

Safety review means a periodic review provided by the licensee for its employees on radiation safety aspects of well logging. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, accidents or errors that have been observed, and opportunities for employees to ask safety questions.

Source holder means a housing or assembly into which a sealed source is placed to facilitate the handling and use of the source in well logging.

Subsurface tracer study means the release of unsealed radioactive material or a substance labeled with radioactive material in a single well for the purpose of tracing the movement or position of the material or substance in the well or adjacent formation.

Surface casing for protecting fresh water aquifers means a pipe or tube used as a lining in a well to isolate fresh water aquifers from the well.

Temporary jobsite means a place where radioactive materials are present for the purpose of performing well logging or subsurface tracer studies.

Tritium neutron generator target source means a tritium source used within a neutron generator tube to produce neutrons for use in well logging applications.

Uranium sinker bar means a weight containing depleted uranium used to pull a logging tool toward the bottom of a well.

Well means a drilled hole in which well logging may be performed. "Well" includes drilled holes for the purpose of oil, gas, mineral, groundwater, or geological exploration.

Well logging means all operations involving the lowering and raising of measuring devices or tools which contain radioactive material or are used to detect radioactive materials in wells for the purpose of obtaining information about the well or adjacent formations which may be used in oil, gas, mineral, groundwater, or geological exploration.

14-003 SPECIFIC LICENSES FOR WELL LOGGING

14-003.01 The Department will approve an application for a specific license for the use of licensed material in well logging if the applicant meets the following requirements:

1. The applicant must satisfy the general requirements specified in 180 NAC 3-011 for radioactive material, in 180 NAC 3-015 for source material and any special requirements contained in 180 NAC 14.

2. The applicant must develop a program for training logging supervisors and logging assistants and submit to the Department a description of this program which specifies the:

    a. Initial training;
    b. On-the-job training;
    c. Annual safety reviews provided by the licensee;
    d. Means the applicant will use to demonstrate the logging supervisor's knowledge and understanding of and ability to comply with the Department's regulations and licensing requirements and the applicant's operating and emergency procedures; and
    e. Means the applicant will use to demonstrate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures.

3. The applicant must submit to the Department written operating and emergency procedures as described in 180 NAC 14-018 or an outline or summary of the procedures that includes the important radiation safety aspects of the procedures.

4. The applicant must establish and submit to the Department its program for annual inspections of the job performance of each logging supervisor to ensure that the Department's regulations, license requirements, and the applicant's operating and emergency procedures are followed. Inspection records must be retained for 3 years after each annual internal inspection.

5. The applicant must submit a description of its overall organizational structure as it applies to the radiation safety responsibilities in well logging, including specified delegations of authority and responsibility.

6. If an applicant wants to perform leak testing of sealed sources, the applicant must identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant wants to analyze its own wipe samples, the applicant must establish procedures to be followed and submit a description of these procedures to the Department. The description must include the:

   a. Instruments to be used;
   b. Methods of performing the analysis; and
   c. Pertinent experience of the person who will analyze the wipe samples.

14-004 AGREEMENT WITH WELL OWNER OR OPERATOR

14-004.01 A licensee may perform well logging with a sealed source only after the licensee has a written agreement with the employing well owner or operator. This written agreement must identify who will meet the following requirements.

1. If a sealed source becomes lodged in the well, a reasonable effort will be made to recover it;
2. A person may not attempt to recover a sealed source in a manner which, in the licensee's opinion, could result in its rupture;
3. The radiation monitoring required in 180 NAC 14-021.01 will be performed;
4. If the environment, any equipment, or personnel are contaminated with radioactive material, they must be decontaminated before release from the site or release for unrestricted use; and
5. If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the following requirements must be implemented within 30 days:

   a. Each irretrievable well logging source must be immobilized and sealed in place with a cement plug.
   b. A means to prevent inadvertent intrusion on the source, unless the source is not accessible to any subsequent drilling operations and
   c. A permanent identification plaque, constructed of long lasting material such as stainless steel, brass, bronze, or monel, must be mounted at the surface of the well, unless the mounting of the plaque is not practical. The size of the plaque must be at least 17 cm (7 inches) square and 3 mm (1/8 inch) thick. The plaque must contain:

      (1) The word "Caution";
      (2) The radiation symbol (the color requirement in 180 NAC 4-033.01 need not be met);
      (3) The date the source was abandoned;
      (4) The name of the well owner or well operator as appropriate;
      (5) The well name and well identification number(s) or other designation;
      (6) An identification of the sealed source(s) by radionuclide and quantity;

(7) The depth of the source and depth to the top of the plug; and

(8) An appropriate warning such as "DO NOT RE-ENTER THIS WELL".

d. If a radioactive source is classified as irretrievably lost in any well or test hole, the licensee must, within 15 days, file with the Register of Deeds of the County in which the well or test hole is located, a map of the location, including the legal description where the source was irretrievably lost, and a statement identifying the type and quantity of the radioactive source. Certified copies of the filing must be submitted to the Department within 30 days of the filing.

14-004.02 The licensee must retain a copy of the written agreement for three years after the completion of the well logging operation.

14-004.03 If a radioactive source is irretrievably lost in a fresh water aquifer or down a liquefied petroleum products storage cavity, then a drilling safety zone must be established by the Department upon review of the geology and hydrology of the site. All wells and storage cavities in the drilling safety zone must be abandoned and no fluids may be removed except upon approval by the Department. In addition of the notice requirements in 180 NAC 14-004.01, item 5, within 15 days after receipt of notice of the establishment of a drilling safety zone by the Department, the licensee must prepare a map of the drilling safety zone indicating the type and quantity of radioactive source, and the map must be filed with the Register of Deeds of any County which forms a portion of the drilling safety zone. Certified copies of the filing must be submitted to the Department within 30 days after the filing.

14-004.04 A written agreement between the licensee and the well owner or operator is not required if the licensee and the well owner or operator are part of the same corporate structure or otherwise similarly affiliated. However, the licensee must still otherwise meet the requirements in 180 NAC 14-004.01, item 1 through item 5.

EQUIPMENT

14-005 LABELS, SECURITY AND TRANSPORTATION PRECAUTIONS

14-005.01 Labels

1. The licensee may not use a source, source holder, or logging tool that contains radioactive material unless the smallest component that is transported as a separate piece of equipment with the radioactive material inside bears a durable, legible, and clearly visible marking or label. The marking or label must contain the radiation symbol specified in 180 NAC 4-033.01, without the conventional color requirements, and the wording:

CAUTION[1]
RADIOACTIVE MATERIAL

2. The licensee may not use a container to store radioactive material unless the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the radiation symbol specified in and the wording:

CAUTION[2]
RADIOACTIVE MATERIAL
NOTIFY CIVIL AUTHORITIES (or NAME OF COMPANY)

3. The licensee may not transport radioactive material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers in accordance with regulations set out in 180 NAC 13.

14-005.02 Security, Precautions During Storage and Transportation

1. The licensee must store each source containing radioactive material in a storage container or transportation package. The container or package must be locked and physically secured to prevent tampering or removal of radioactive material from storage by unauthorized personnel. The licensee must store radioactive material in a manner that will minimize danger from explosion or fire.
2. The licensee must lock and physically secure the transport package containing radioactive material in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal of the radioactive material from the vehicle.

14-006 RADIATION SURVEY INSTRUMENTS

14-006.01 The licensee must keep a calibrated and operable radiation survey instrument capable of detecting beta and gamma radiation at each field station and temporary jobsite to make the radiation surveys required by 180 NAC 14 and by 180 NAC 4. To satisfy this requirement, the radiation survey instrument must be capable of measuring 0.001 mSv (0.1 mrem) per hour through at least 0.5 mSV (50 mrem) per hour.

14-006.02 The licensee must have available additional calibrated and operable radiation survey instruments sensitive enough to detect the low radiation and contamination levels that could be encountered if a sealed source ruptured. The licensee may own the instruments or may have a procedure to obtain them quickly from a second party.

14-006.03 The licensee must have each radiation survey instrument required under 180 NAC 14-006.01 calibrated:

[1] Or "Danger".

[2] Ibid. p. 4 Removed

1. At intervals not to exceed six months and after instrument servicing;
2. For linear scale instruments, at two points located approximately 1/3 and 2/3 of full scale on each scale; for logarithmic scale instruments, at midrange of each decade, and at two points of at least one decade; and for digital instruments, at approximate points;
3. So that an accuracy within plus or minus 20% of the calibration standard can be demonstrated on each scale; and
4. At energies and radiation levels appropriate for use.

14-006.04 The licensee must retain calibration records for a period of three years after the date of calibration for inspection by the Department.

14-007 LEAK TESTING OF SEALED SOURCES

14-007.01 Requirements: Each licensee using sealed sources of radioactive material must have the sources tested for leakage. Records of leak test results must be kept in units of microcuries and maintained for inspection by the Department.

14-007.02 Method of Testing: The wipe of a sealed source must be performed using a leak test kit or method approved by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State. The wipe sample must be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample must be analyzed for radioactive contamination. The analysis must be capable of detecting the presence of 185 Bq (0.005 microcuries) of radioactive material on the test sample and must be performed by a person approved by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State to perform the analysis.

14-007.03 Testing Frequency

1. Each sealed source (except an energy compensation source (ECS) must be tested at intervals not to exceed six months. In the absence of a certificate from a transferor that a test has been made within the six months before the transfer, the sealed source may not be used until tested.
2. Each ECS that is not exempt from testing in accordance with 180 NAC 14-007.05 must be tested at intervals not to exceed three years. In the absence of a certificate from a transferor that a test has been made within the three years before the transfer, the ECS may not be used until tested.

14-007.04 Removal of Leaking Source from Service

1. If the test conducted pursuant to 180 NAC 14-007.01 and 14-007.02 reveals the presence of 185 Bq (0.005 microcuries) or more of removable radioactive material, the licensee must remove the sealed source from service immediately and have it decontaminated, repaired, or disposed of by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State licensee that is authorized to perform these functions. The licensee must check the

equipment associated with the leaking source for radioactive contamination and, if contaminated, have it decontaminated or disposed of by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State licensee that is authorized to perform these functions.

2. The licensee must submit a report to the Department within five days of receiving the test results. The report must describe the equipment involved in the leak test, the test results, any contamination which resulted from the leaking source, and the corrective actions taken up to the time the report is made.

14-007.05 Exemptions from Testing Requirements: The following sealed sources are exempt from the periodic leak test requirements set out in 180 NAC 14-007.01 through 14-007.04:

1. Hydrogen-3 (tritium) sources;
2. Sources containing radioactive material with a half-life of 30 days or less;
3. Sealed sources containing radioactive material in gaseous form;
4. Sources of beta- or gamma- emitting radioactive material with an activity of 3.7 MBq (100 microcuries) or less; and
5. Sources of alpha- or neutron- emitting radioactive material with an activity of 0.37 MBq (10 microcuries) or less.

14-008 PHYSICAL INVENTORY: Each licensee must conduct quarterly physical inventory to account for all radioactive material received and possessed under the license. The licensee must retain records of the inventory for three years from the date of the inventory for inspection by the Department. The inventory must indicate the quantity and kind of radioactive material, the location of the radioactive material, the date of the inventory, and the name of the individual conducting the inventory. Physical inventory records may be combined with leak test records.

14-009 RECORDS OF MATERIAL USE

14-009.01 Each licensee must maintain records for each use of radioactive material showing:

1. The make, model number, and a serial number or a description of each sealed source used;
2. In the case of unsealed radioactive material used for subsurface tracer studies, the radionuclide and quantity of activity used in a particular well and the disposition of any unused tracer materials;
3. The identity of the logging supervisor who is responsible for the radioactive material and the identity of logging assistants present; and
4. The location and date of use of the radioactive material.

14-009.02 The licensee must make the records required by 180 NAC 14-009.01 available for inspection by the Department. The licensee must retain the records for three years from the date of the recorded event.

14-010 DESIGN, PERFORMANCE CRITERIA FOR SEALED SOURCES

14-010.01 A licensee may use a sealed source for use in well logging applications if:

1. The sealed source is doubly encapsulated;
2. The sealed source contains radioactive material whose chemical and physical forms are as insoluble and nondispersible as practical; and
3. Meets the requirements of 180 NAC 14-010.02, 14-010.03 or 14-010.04.

14-010.02 For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source, for use in well logging applications if it meets the requirements of USASI N5.10-1968, "Classification of Sealed Radioactive Sources", or the requirements in 180 NAC 14-010.03 and 14-010.04.

14-010.03 For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications if it meets the oil-well logging requirements of ANSI/HPS N43.6-1997, "Sealed Radioactive Sources - Classification."

14-010.04 For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for use in well logging applications, if:

1. The sealed source's prototype has been tested and found to maintain its integrity
   after each of the following tests:

   a. Temperature. The test source must be held at -40°C (-40°F) for 20 minutes, 600°C (1112°F) for 1 hour, and then be subject to a thermal shock test with a temperature drop from 600°C (1112°F) to 20°C (68°F) within 15 seconds.
   b. Impact Test. A 5 kg steel hammer, 2.5 cm in diameter, must be dropped from a height of 1 m onto the test source.
   c. Vibration Test. The test source must be subject to a vibration from 25 Hz to 500 Hz at 5 g amplitude for 30 minutes.
   d. Puncture Test. A 1 gram hammer and pin, 0.3 cm pin diameter, must be dropped from a height of 1 m onto the test source.
   e. Pressure Test. The test source must be subjected to an external pressure of 1.695E+7 pascals (24,600 pounds per square inch absolute).

14-010.05 The requirements in 180 NAC 14-010.01, 14-010.02, 14-010.03 and 14-010.04 do not apply to sealed sources that contain radioactive material in gaseous form.

14-010.06 The requirements in 180 NAC 14-010.01, 14-010.02, 14-010.03 and 14-010.04 do not apply to energy compensation sources (ECS). ECSs must be registered with the U.S. Nuclear Regulatory Commission under 10 CFR 32.210 or with an Agreement State.

14-011 INSPECTION MAINTENANCE AND OPENING OF A SOURCE OR SOURCE HOLDER

14-011.01 Each licensee must visually check source holders, logging tools, and source handling tools, for defects before each use to ensure that the equipment is in good working condition and that required labeling is present. If defects are found, the equipment must be removed from service until repaired and a record must be made listing: the date of check, name of inspector, equipment involved, defects found, and repairs made. These records must be retained for three years after the defect is found.

14-011.02 Each licensee must conduct, at intervals not to exceed six months, a program of visual inspection and routine maintenance of source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling is legible and that no physical damage is visible. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing: date, equipment involved, inspection and maintenance operations performed, any defects found, and any actions taken to correct the defects. These records must be retained for three years after the defect is found.

14-011.03 Removal of a sealed source from a source holder or logging tool, and maintenance on sealed sources or holders in which sealed sources are contained may not be performed by the licensee unless a written procedure pursuant to 180 NAC 14-018 has been developed by the licensee and approved by the Department based upon compliance with 180 NAC 4 and 10.

14-011.04 If a sealed source is stuck in the source holder, the licensee may not perform any operation on the source holder, such as drilling, cutting, or chiseling, unless the licensee is specifically approved by the Department; approval is based upon training and experience of the licensee and upon compliance with 180 NAC 4 and 10.

14-011.05 The opening, repair, or modification of any sealed source must be performed by persons specifically approved to do so by the Department, U.S. Nuclear Regulatory Commission, or an Agreement State.

14-012 SUBSURFACE TRACER STUDIES

14-012.01 The licensee must require all personnel handling radioactive tracer material to use protective gloves and, if required by the licensee, other protective clothing and equipment. The licensee must take precautions to avoid ingestion or inhalation of radioactive tracer material and to avoid contamination of field stations and temporary jobsites.

14-012.02 A licensee may not knowingly inject radioactive material into fresh water aquifers.

14-013 URANIUM SINKER BARS: The licensee may use a uranium sinker bar in well logging applications only if it is legibly impressed with the words "CAUTION - RADIOACTIVE - DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND".

14-014 USE OF A SEALED SOURCE

14-014.01 In a Well with a Surface Casing: No sealed source may be used in any well unless the well is cased pursuant to the rules and regulations of the Nebraska Oil and Gas Conservation Commission Title 267 Chapter 3, 012.01 through 012.03 and 012.09 and Chapter 4, 006.01B, except as pursuant to 14-014.02.

14-014.02 In a Well without a Surface Casing: The licensee may use a sealed source in a well without a surface casing for protecting fresh water aquifers only if the licensee follows a procedure for reducing the probability of the source becoming lodged in the well. The procedure must be approved by the Department, the U.S. Nuclear Regulatory Commission, or another Agreement State.

14-015 ENERGY COMPENSATION SOURCE: The licensee may use an energy compensation source (ECS) which is contained within a logging tool, or other tool components, only if the ECS contains quantities of licensed material not exceeding 3.7 MBq (100 microcuries):

14-015.01 For well logging applications with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 180 NAC 14-007,14-008 and 14-009.

14-015.02 For well logging applications without the surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 180 NAC 14-004, 14-007, 14-008, 14-009, 14-014, and 14-027.

14-016 TRITIUM NEUTRON GENERATOR TARGET SOURCE

14-016.01 Use of a tritium neutron generator target source, containing quantities not exceeding 1,110 MBq (30 curies) and in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of 180 NAC 14 except 180 NAC 14-004, 14-010 and 14-027.

14-016.02 Use of a tritium neutron generator target source, containing quantities exceeding 1,110 MBq (30 curies) or in a well without a surface casing to protect fresh water aquifers, is subject to the requirements of 180 NAC 14 except 180 NAC 14-010.

RADIATION SAFETY REQUIREMENTS

14-017 TRAINING AND EXPERIENCE QUALIFICATION REQUIREMENTS FOR WELL LOGGING PERSONNEL

14-017.01 Radiation Safety Officer:

1. A college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering;
2. Qualified well logger or six weeks on-the-job training under an authorized user; and
3. Forty hours of formal instruction in:

a. Principles and practices of radiation protection;
b. Radioactivity measurements standardization and monitoring techniques and instruments;
c. Mathematics and calculations basic to the use of and measurement of radioactivity;
d. Biological effects of radiation, and
e. Operating and emergency procedures and federal and state radiation control regulations.

14-017.02 The licensee must not permit an individual to act as a logging supervisor until that person:

1. Has completed forty hours of formal training in the subjects outlined in 180 NAC 14-017.06;
2. Has received copies of, and instruction in:

a. 180 NAC 4, 10, and 14;
b. The license under which the logging supervisor will perform well logging; and
c. The licensee's operating and emergency procedures required by 180 NAC 14-019;

3. Has completed six weeks of on-the-job training under a logging supervisor and demonstrated competence in the use of radioactive materials, remote handling tools, and radiation survey instruments by a field evaluation; and
4. Has demonstrated understanding of the requirements in 180 NAC 14-017.02 and 14-017.02, items 1 and 2 by successfully completing a written test.

14-017.03 The licensee must not permit an individual to act as a logging assistant until that person:

1. Has received instruction in applicable parts of 180 NAC 4, and 10;
2. Has received copies of, and instruction in, the licensee's operating and emergency procedures required by 180 NAC 14-018;
3. Has demonstrated understanding of the materials listed in 180 NAC 14-017.03 item 1 and 2 by successfully completing the test; and
4. Has received instruction in the use of radioactive materials, remote handling tools, and radiation survey instruments, as appropriate for the logging assistant's intended job responsibilities.

14-017.04 The licensee must provide safety reviews for logging supervisors and logging assistants at least once during each calendar year.

14-017.05 The licensee must maintain a record on each logging supervisor's and logging assistant's training and annual safety review. The training records must include copies of written tests and dates of oral tests. The training records must be retained for three years

following the termination of employment. Records of annual safety reviews must list the topics discussed and be retained for three years.

14-017.06 The licensee must include the following subjects in the training required in 180 NAC 14-017.02:

1. Fundamentals of radiation safety including:

   a. Characteristics of radiation;
   b. Units of radiation dose and quantity of radioactivity;
   c. Hazards of exposure to radiation;
   d. Levels of radiation from radioactive material;
   e. Methods of controlling radiation dose (time, distance, and shielding); and
   f. Radiation safety practices, including prevention of contamination, and methods of decontamination.

2. Radiation detection instruments including:

   a. Use, operation, calibration, and limitations of radiation survey instruments;
   b. Survey techniques; and
   c. Use of personnel monitoring equipment;

3. Equipment to be used including:

   a. Operation of equipment, including source handling equipment and remote handling tools;
   b. Storage, control, and disposal of radioactive material; and
   c. Maintenance of equipment.

4. The requirements of pertinent regulations. And
5. Case histories of accidents in well logging.

14-018 OPERATING AND EMERGENCY PROCEDURES: Each licensee must develop and follow written operating and emergency procedures that cover:

1. The handling and use of radioactive materials including the use of sealed sources in wells without surface casing for protecting fresh water aquifers, if appropriate;
2. The use of remote handling tools for handling sealed sources and radioactive tracer material except low-activity calibration sources;
3. Methods and occasions for conducting radiation surveys, including surveys for detecting contamination, as required by 180 NAC 14-020.02 through 14-020.05;
4. Minimizing personnel exposure including exposures from inhalation and ingestion of radioactive tracer materials;
5. Methods and occasions for locking and securing stored radioactive materials;
6. Personnel monitoring and the use of personnel monitoring equipment;

7. Transportation of sources of radiation to field stations or temporary jobsites, packaging of sources of radiation for transport in vehicles, placarding of vehicles when needed, and physically securing sources of radiation in transport vehicles during transportation to prevent accidental loss, tampering or unauthorized removal;
8. Picking up, receiving, and opening packages containing radioactive materials, in accordance with 180 NAC 4-038;
9. For the use of tracers, decontamination of the environment, equipment, and personnel;
10. Maintenance of records generated by logging personnel at temporary jobsites;
11. The inspection and maintenance of sealed sources, source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars as required by 180 NAC 14-011;
12. Actions to be taken if a sealed source is lodged in a well;
13. Notifying proper persons in the event of an accident; and
14. Actions to be taken if a sealed source is ruptured including actions to prevent the spread of contamination, to minimize inhalation and ingestion of radioactive materials, and actions to obtain suitable radiation survey instruments as required by 180 NAC 14-006.02.

14-019 PERSONNEL MONITORING

14-019.01 The licensee may not permit an individual to act as a logging supervisor or logging assistant unless that person wears, at all times during the handling of licensed radioactive materials, a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. Each personnel dosimeter must be assigned to and worn by only one individual. Film badges must be replaced at least monthly and other personnel dosimeters at least quarterly. After replacement, each personnel dosimeter must be promptly processed.

14-019.02 The licensee must provide bioassay services to individuals using radioactive materials in subsurface tracer studies if required by the license.

14-019.03 The licensee must retain records of personnel dosimeters required by 14-019.01 and bioassay results for inspection until the Department authorizes disposition of records.

14-020 RADIATION SURVEYS

14-020.01 The licensee must make radiation surveys, including but not limited to the surveys required under 180 NAC 14-020.02 through 14-020.05, of each area where radioactive materials are used and stored.

14-020.02 Before transporting radioactive materials, the licensee must make a radiation survey of the position occupied by each individual in the vehicle and of the exterior of each vehicle used to transport the radioactive materials.

14-020.03 If the sealed source assembly is removed from the logging tool before departure from the temporary jobsite, the licensee must confirm that the logging tool is free of contamination by energizing the logging tool detector or by using a survey meter.

14-020.04 If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of sealed source could be damaged by the operation, the licensee must conduct a radiation survey, including a contamination survey, during and after the operation.

14-020.05 The licensee must make a radiation survey at the temporary jobsite before and after each subsurface tracer study to confirm the absence of contamination.

14-020.06 The results of surveys required under 180 NAC 14-020.01 through 14-020.05 must be recorded and must include the date of the survey, the name of the individual making the survey, the identification of the survey instrument used, and the location of the survey. The licensee must retain records of survey for inspection by the Department for three years after they are made.

14-021 RADIOACTIVE CONTAMINATION CONTROL

14-021.01 If the licensee detects evidence that a sealed source has ruptured or radioactive materials have caused contamination, the licensee may initiate immediately the emergency procedures required by 180 NAC 14-017.

14-021.02 If contamination results from the use of radioactive material in well logging, the licensee must decontaminate all work areas, equipment, and unrestricted areas.

14-021.03 During efforts to recover a sealed source lodged in the well, the licensee must continuously monitor, with an appropriate radiation detection instrument or a logging tool with a radiation detector, the circulating fluids from the well, if any, to check for contamination resulting from damage to the sealed source.

PRECAUTIONARY PROCEDURES IN LOGGING AND SUBSURFACE TRACER

14-022 HANDLING TOOLS: The licensee must provide and require the use of tools that will assure remote handling of sealed sources other than low-activity calibration sources.

14-023 PARTICLE ACCELERATORS: No licensee or registrant must permit above-ground testing of particle accelerators, designed for use in well logging, which results in the production of radiation, except in areas or facilities controlled or shielded so that the requirements of 180 NAC 4-005 and 4-013, as appropriate, are met.

SECURITY, RECORDS, NOTIFICATIONS

14-024 SECURITY

14-024.01 A logging supervisor must be physically present at a temporary jobsite whenever radioactive material is being handled or are not stored and locked in a vehicle or storage place. The logging supervisor may leave the jobsite in order to obtain assistance if a source becomes lodged in a well.

14-024.02 During well logging, except when radiation sources are below ground or in shipping or storage containers, the logging supervisor or other individual designated by the logging supervisor must maintain direct surveillance of the operation to prevent unauthorized entry into a restricted area, as defined 180 NAC 1-002.

14-025 DOCUMENTS AND RECORDS REQUIRED AT FIELD STATIONS: Each licensee must maintain the following documents and records at the field station:

1. A copy of 180 NAC 4, 10 and 14;
2. The license authorizing the use of radioactive material;
3. Operating and emergency procedures required by 180 NAC 14-018;
4. The record of radiation survey instrument calibrations required by 180 NAC 14-006;
5. The record of leak tests required by 180 NAC 14-007;
6. Physical inventory records required by 180 NAC 14-008;
7. Utilization records required by 180 NAC 14-009;
8. Records of inspection and maintenance required by 180 NAC 14-011;
9. Training records required by 180 NAC 14-017; and
10. Survey records required by 180 NAC 14-020.

14-026 DOCUMENTS AND RECORDS REQUIRED AT TEMPORARY JOBSITES: Each licensee conducting operations at a temporary jobsite must maintain the following documents and records at the temporary jobsite until the well logging operation is completed:

1. Operating and emergency procedures required by 180 NAC 14-018;
2. Evidence of latest calibration of the radiation survey instruments in use at the site required by 180 NAC 14-006;
3. Latest survey records required by 180 NAC 14-020.02, 14-020.03 and 14-020.05;
4. The shipping papers for the transportation of radioactive materials required by 180 NAC 13-005; and
5. When operating under reciprocity pursuant to 180 NAC 3-028, a copy of the U.S. Nuclear Regulatory Commission or Agreement State License authorizing use of radioactive materials.

14-027 NOTIFICATION OF INCIDENTS AND LOST SOURCES; ABANDONMENT PROCEDURES FOR IRRETRIEVABLE SOURCES

14-027.01 The licensee must immediately notify the Department by telephone and subsequently, within 30 days, by confirmatory letter if the licensee knows or has reason to believe that a sealed source has been ruptured. The letter must designate the well or other location, describe the magnitude and extent of the escape of radioactive materials,

assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences.

14-027.02 The licensee must notify the Department of the theft or loss of radioactive materials, radiation overexposures, excessive levels and concentrations of radiation, and certain other accidents as required by 180 NAC 4-057, 4-058, 4-059 and 180 NAC 3-026.

14-027.03 If a sealed source becomes lodged in a well, and when it becomes apparent that efforts to recover the sealed source will not be successful, the licensee must:

1. Notify the appropriate Department by telephone of the circumstances that resulted in the inability to retrieve the source and
   a. Obtain Department approval to implement abandonment procedures; or
   b. That the licensee implemented abandonment before receiving Department approval because the licensee believed there was an immediate threat to public health and safety; and
2. Advise the well owner or operator, as appropriate, of the abandonment procedures under 180 NAC 14-004.01 or 14-004.03; and
3. Either ensure that abandonment procedures are implemented within 30 days after the sealed source has been classified as irretrievable or request an extension of time if unable to complete the abandonment procedures.

14-027.04 The licensee must, within 30 days after a sealed source has been classified as irretrievable, make a report in writing to the Department. The report must contain the following information:

1. Date of occurrence;
2. A description of the irretrievable well logging source involved including the radionuclide and its quantity, chemical, and physical form;
3. Surface location and identification of the well;
4. Results of efforts to immobilize and seal the source in place;
5. A brief description of the attempted recovery effort;
6. Depth of the source;
7. Depth of the top of the cement plug;
8. Depth of the well; and
9. The immediate threat to public health and safety justification for implementing abandonment if prior to Department approval was not obtained in accordance with 180 NAC 14-027.03, item 1.b.
10. Any other information, such as a warning statement, contained on the permanent identification plaque.