

TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER b: RADIATION PROTECTION

PART 351
RADIATION SAFETY REQUIREMENTS FOR WIRELINE
SERVICE OPERATIONS AND SUBSURFACE TRACER STUDIES

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351.APPENDIX B	Example of Plaque for Identifying Wells Containing Sealed Sources Containing Radioactive Material Abandoned Downhole

AUTHORITY: Implementing and authorized by Sections 9 and 11 of the Radiation Protection Act of 1990 [420 ILCS 40/9 and 11] and Section 5 of the Personnel Radiation Monitoring Act

[420 ILCS 25/5].

SOURCE: Adopted at 10 Ill. Reg. 17507, effective September 25, 1986; amended at 11 Ill. Reg. 5215, effective March 13, 1987; amended at 13 Ill. Reg. 13605, effective August 11, 1989; amended at 14 Ill. Reg. 13633, effective August 13, 1990; amended at 18 Ill. Reg. 3344, effective February 22, 1994; emergency amendment at 22 Ill. Reg. 21108, effective November 17, 1998, for a maximum of 150 days; amended at 23 Ill. Reg. 2907, effective February 25, 1999; recodified from the Department of Nuclear Safety to the Illinois Emergency Management Agency at 27 Ill. Reg. 13641; amended at 28 Ill. Reg. 12643, effective October 1, 2004.

Section 351.10 Purpose

This Part establishes radiation safety requirements for individuals using sources of radiation for wireline service operations, including mineral logging, radioactive markers and subsurface tracer studies. The requirements of this Part are in addition to, and not in substitution for, the requirements of 32 Ill. Adm. Code: Chapter II, Subchapters b and d.

(Source: Amended at 18 Ill. Reg. 3344, effective February 22, 1994)

Section 351.20 Scope

The regulations in this Part apply to all licensees or registrants who use sources of radiation for wireline service operations, including mineral logging, radioactive markers, or subsurface tracer studies.

Section 351.25 Incorporations by Reference

All rules, standards and guidelines of agencies of the United States or nationally recognized organizations or associations that are incorporated by reference in this Part are incorporated as of the date specified in the reference and do not include any later amendments or editions. Copies of these rules, standards and guidelines that have been incorporated by reference are available for public inspection at the Illinois Emergency Management Agency, 1035 Outer Park Drive, Springfield, Illinois.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.30 Definitions

As used in this Part, the following definitions apply:

"Agency" means the Illinois Emergency Management Agency.

"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 radiation sources may be stored or used and from which equipment is dispatched to temporary jobsites.

"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.

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

"Logging supervisor" means the individual who provides personal supervision of the utilization of sources of radiation at the well site.

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

"Mineral logging" means any logging performed for the purpose of mineral exploration other than oil or gas.

"Personal supervision" means guidance and instruction by the supervisor who is physically present at the jobsite and watching the performance of the operation in such proximity that visual contact can be maintained and immediate assistance given as required.

"Radioactive marker" means radioactive material placed subsurface or on a structure intended for subsurface use for the purpose of depth determination or direction orientation.

"Source holder" means a housing or assembly into which a radioactive source is placed for the purpose of facilitating the handling and use of the source in well-logging operations.

"Subsurface tracer study" means the release of a substance tagged with radioactive material for the purpose of tracing the movement or position of the tagged substance in the well-bore or adjacent formation.

"Temporary jobsite" means a location to which radioactive materials have been dispatched to perform wireline service operations or subsurface tracer studies.

"Tritium neutron generator target source" means a tritium (hydrogen-3) source used within a neutron generator tube to produce neutrons for use in well-logging applications.

"Well-bore" means a drilled hole in which wireline service operations and subsurface tracer studies are performed.

"Well-logging" means the lowering and raising of measuring devices or tools which may contain sources of radiation into well-bores or cavities for the purpose of obtaining information about the well and/or adjacent formations.

"Wireline" means a cable containing one or more electrical conductors which is used to lower and raise logging tools in the well-bore.

"Wireline service operation" means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.40 Prohibition

No licensee or registrant shall perform wireline service operations with sealed source(s) unless, prior to commencement of the operation, the licensee has a written agreement with the well operator, well owner, drilling contractor or land owner that:

- a) In the event a sealed source is lodged downhole, efforts at recovery will be made that are commensurate with the circumstances of the specific case, e.g., quantity and half-life of the radionuclide, depth of the source and presence of potable water aquifers; and
- b) In the event a decision is made to abandon the sealed source downhole, the requirements of Section 351.5010(d) of this Part shall be met within 30 days after a decision by the licensee to abandon the source has been approved by the Illinois Emergency Management Agency (Agency).

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1010 Limits on Levels of Radiation

Sources of radiation shall be used, stored and transported in a manner that the transportation requirements of 32 Ill. Adm. Code 341 and the dose limitation requirements of 32 Ill. Adm. Code 340 are met.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1020 Storage Precautions

- a) Each source of radiation, except accelerators, shall be provided with a storage and/or transport container. The container shall be provided with a lock, or tamper seal for calibration sources, to prevent unauthorized removal of, or exposure to, the source of radiation.

- b) When in storage, sources of radiation shall be isolated from flammable or explosive substances.

Section 351.1030 Transport Precautions

Transport containers shall be physically secured to the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal.

Section 351.1040 Radiation Survey Instruments

- a) The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments at each field station to make physical radiation surveys as required by this Part and by 32 Ill. Adm. Code 340.510(a). Instrumentation shall be capable of measuring 0.001 mSv (0.1 mrem) per hour through at least 0.5 mSv (50 mrem) per hour. This range is considered equivalent to 25.8 nC/kg (100 microR) per hour through at least 5.16 microC/kg (20 mR) per hour for the gamma radiation sources typically used in well-logging.
- b) Each radiation survey instrument shall be calibrated:
 - 1) At intervals not to exceed 6 months and after each instrument servicing (e.g., electronic repair);
 - 2) At energies and radiation levels equivalent to those to be encountered during use; and
 - 3) So that accuracy within plus or minus 20 percent of the true radiation level can be demonstrated on each scale.
- c) Calibration records shall be maintained for a period of 2 years for inspection by the Agency.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1050 Testing for Leakage or Contamination of Sealed Sources

- a) Testing for leakage or contamination of sealed sources shall be performed in accordance with 32 Ill. Adm. Code 340.410. Test samples shall be taken from the surfaces of sources or source holders or from the surfaces of devices in which sources are mounted and on which one might expect contamination to accumulate. The wipe of a sealed source must be performed using a leak test kit approved by the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State.
- b) Each energy compensation source that is not exempt from testing for leakage or contamination in accordance with 32 Ill. Adm. Code 340.410(b) shall be tested at

intervals not to exceed 3 years. In the absence of a certificate from a transferor that a test has been made within the 3 years before the transfer, the energy compensation source shall not be used until tested in accordance with 32 Ill. Adm. Code 340.410.

- c) If a sealed source is found to be leaking in accordance with 32 Ill. Adm. Code 340.410, the licensee shall check the equipment associated with the leaking source for radioactive contamination and, if contaminated, have it decontaminated or disposed of by persons specifically authorized by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State to perform such services.
- d) The licensee shall maintain records of testing for leakage or contamination of sealed sources in accordance with 32 Ill. Adm. Code 340.1135.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1060 Quarterly Inventory

Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation. If all sources are not accounted for during the inventory, the licensee or registrant shall notify the Agency in accordance with the requirements of 32 Ill. Adm. Code 340.1210. Records of inventories shall be maintained for 2 years from the date of inventory for inspection by the Agency and shall include the quantities and kinds of sources of radiation, the location where sources of radiation are assigned, the date of the inventory and the name of the individual conducting the inventory.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1070 Utilization Records

Each licensee or registrant shall maintain current records, which shall be kept available for inspection by the Agency for 2 years from the date of the recorded event, showing the following information for each source of radiation:

- a) Make, model number and a serial number or a description of each source of radiation used;
- b) The identity of the well-logging supervisor or field unit to whom assigned;
- c) Locations where used and dates of use; and
- d) In the case of tracer materials and radioactive markers, the utilization record shall indicate the radionuclide and activity used in a particular well.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1080 Design and Performance Criteria for Sealed Sources Used in Downhole Operations

- a) A licensee may not use a sealed source in well-logging unless:
 - 1) The sealed source is doubly encapsulated;
 - 2) The sealed source contains radioactive material whose chemical and physical forms are insoluble and non-dispersible; and
 - 3) A prototype of the sealed source has been tested and meets the performance standards for oil well-logging sources contained in either the United States of America Standards Institute (USASI) Standard No. N5.10-1968, "Classification of Sealed Radioactive Sources", or the revision of N5.10-1968, which is American National Standards Institute (ANSI) Standard No. N542-1977 (1978 edition), "Sealed Radioactive Sources, Classification", which was reaffirmed and redesignated ANSI N43.6-1977(R 1989), exclusive of subsequent amendments or editions, or the sealed source prototype has been tested and found to maintain its integrity after each of the following tests:
 - A) Temperature. The test source was held at minus 40 degrees Celsius for 20 minutes, 600 degrees Celsius for 1 hour and then subjected to a thermal shock test with a temperature drop from 600 degrees Celsius to 20 degrees Celsius within 15 seconds.
 - B) Impact test. A 5 kg steel hammer, 2.5 cm in diameter, was dropped from a height of 1 m onto the test source.
 - C) Vibration test. The test source was subjected to a vibration from 25 Hz to 500 Hz at an amplitude of 5 times the acceleration of gravity for 30 minutes.
 - D) Puncture test. A 1 gram hammer and pin, 0.3 cm pin diameter, was dropped from a height of 1 m onto the test source.
 - E) Pressure test. The test source was subjected to an external pressure of 16.95 MPascals (24,600 pounds per square inch absolute).
- b) The requirements of subsection (a) of this Section do not apply to sealed sources that contain licensed material in gaseous form or to energy compensation sources (ECS). ECSs shall be registered with the Agency, the U.S. Nuclear Regulatory Commission or another Agreement State pursuant to the equivalent of 32 Ill. Adm. Code 330.280(m)(2), e.g., 10 CFR 32.210.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1090 Labeling

- a) Sources, Source Holders or Logging Tools
- 1) Each source, source holder or logging tool containing radioactive material shall bear a durable, legible and clearly visible marking or label which has, as a minimum, the standard radiation caution symbol (as described in 32 Ill. Adm. Code 340.910), without the conventional color requirement and the following wording:

DANGER*
RADIOACTIVE

*AGENCY NOTE: or CAUTION.

- 2) This labeling shall be on every component transported as a separate piece of equipment.
- b) Transport Containers. Each transport container shall have permanently attached to it a durable, legible and clearly visible label which has, as a minimum, the standard radiation caution symbol (as described in 32 Ill. Adm. Code 340.910) and the following wording:

DANGER*
RADIOACTIVE
NOTIFY CIVIL AUTHORITIES (OR NAME OF COMPANY)

*AGENCY NOTE: or CAUTION.

- c) Uranium sinker bars. A well-logging licensee may use a uranium sinker bar in well-logging applications only if it is legibly impressed with the following wording:

CAUTION
RADIOACTIVE-DEPLETED URANIUM
NOTIFY CIVIL AUTHORITIES (OR NAME OF COMPANY) IF FOUND

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.1100 Inspection and Maintenance

- a) Each licensee or registrant shall conduct, at intervals not to exceed 6 months, a program of inspection and maintenance of source holders, logging tools, source handling tools, storage containers, transport containers and injection tools to

assure proper labeling and physical condition. Records of inspection and maintenance shall be maintained for a period of 2 years for inspection by the Agency.

- b) If any inspection conducted pursuant to subsection (a) of this Section reveals damage to labeling or components that could result in release of radioactive material into the environment, or loss of control of radioactive material or that could otherwise create a risk of increase in radiation exposure, the device shall be removed from service until repairs have been made.
- c) The repair, opening or modification of any sealed source shall be performed only by persons specifically authorized to do so by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.2010 Training Requirements

- a) No licensee or registrant shall permit any individual to act as a logging supervisor as defined in this Part until the individual has:
 - 1) Received 40 hours of instruction in the subjects outlined in Appendix A of this Part and has demonstrated to the satisfaction of the licensee or registrant an understanding thereof by successful completion of a written examination administered by the licensee or registrant;
 - 2) Read and received instruction in the regulations contained in this Part and the applicable Sections of 32 Ill. Adm. Code 310, 340 and 400 or the equivalent state or federal regulations, conditions of appropriate license or certificate of registration, and the licensee's or registrant's operating and emergency procedures and demonstrated to the satisfaction of the licensee or registrant an understanding thereof; and
 - 3) Demonstrated to the satisfaction of the licensee or registrant competence to use sources of radiation, related handling tools and radiation survey instruments which will be used on the job.
- b) No licensee or registrant shall permit any individual to assist in the handling of sources of radiation until the individual has:
 - 1) Read or received instruction in the licensee's or registrant's operating and emergency procedures and demonstrated to the satisfaction of the licensee or registrant an understanding thereof; and
 - 2) Demonstrated to the satisfaction of the licensee or registrant competence to use, under the personal supervision of the logging supervisor, the

sources of radiation, related handling tools and radiation survey instruments which will be used on the job.

- c) The licensee or registrant shall maintain employee training records for inspection by the Agency for 2 years following termination of employment.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.2020 Operating and Emergency Procedures

The licensee's or registrant's operating and emergency procedures shall include instructions in at least the following:

- a) Handling and use of sources of radiation to be employed so that no individual is likely to be exposed to radiation doses in excess of the standards established in 32 Ill. Adm. Code 340;
- b) Methods and occasions for conducting radiation surveys, including surveys for detecting contamination as required by Section 351.4010(a) through (e) of this Part;
- c) Methods and occasions for locking and securing sources of radiation;
- d) Personnel monitoring and the use of personnel monitoring equipment;
- e) Transportation to temporary jobsites and field stations, including the packaging and placing of sources of radiation in vehicles, placarding of vehicles and securing sources of radiation during transportation to prevent accidental loss, tampering or unauthorized removal;
- f) Minimizing exposure of individuals in the event of an accident and from inhalation and ingestion of radioactive tracer materials;
- g) Procedure for notifying proper personnel in the event of an accident;
- h) Maintenance of records;
- i) Inspection and maintenance of sealed sources, source holders, logging tools, source handling tools, storage containers, transport containers and injection tools;
- j) Procedure to be followed in the event a sealed source is lodged downhole or likely to be leaking;
- k) Procedures to be used for picking up, receiving and opening packages containing radioactive material in accordance with 32 Ill. Adm. Code 340.960;

- l) Use of sealed sources in wells without surface casing for protecting fresh water aquifers, if appropriate;
- m) Use of remote handling tools for handling sealed sources and radioactive tracer material, except low activity calibration sources; and
- n) Decontamination of the environment, equipment and personnel if radioactive tracer material is used.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.2030 Personnel Monitoring

- a) No licensee or registrant shall permit any individual to act as a logging supervisor or to assist in the handling of sources of radiation unless each individual wears an individual monitoring device provided and evaluated by a qualified dosimetry processor as described in 32 Ill. Adm. Code 340.510(d). Each device shall be assigned to and worn by only one individual.
- b) Records of individual monitoring results shall be retained in accordance with 32 Ill. Adm. Code 340.1160.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.3010 Security

During each logging or tracer application, the logging supervisor or other designated employee shall maintain direct surveillance of the operation to protect against unauthorized and/or unnecessary entry into a restricted area, as defined in 32 Ill. Adm. Code 310.

Section 351.3020 Handling Tools

The licensee or registrant shall provide and require the use of tools that will assure remote handling of sealed sources other than low-activity calibration sources.

Section 351.3022 Tritium Neutron Generator Target Source

- a) Use of a tritium neutron generator target source, containing quantities not exceeding 1,110 MBq (30 Ci) for well-logging in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of this Part, except Sections 351.40, 351.1080 and 351.5010 of this Part. Film badges must be replaced at least monthly and other individual monitoring devices replaced at least quarterly. After replacement, each individual monitoring device must be promptly processed.

- b) Either use of a tritium neutron generator target source containing quantities exceeding 1,110 MBq (30 Ci) or use of a tritium neutron generator target source containing quantities not exceeding 1,110 MBq (30 Ci) in a well without a surface casing to protect fresh water aquifers is subject to the requirements of this Part, except Section 351.1080 of this Part.

(Source: Added at 28 Ill. Reg. 12643, effective August 27, 2004)

Section 351.3025 Energy Compensation Source (ECS)

- a) The licensee may use an ECS that is contained within a logging tool, or other tool components, only if the ECS contains quantities of radioactive material not exceeding 3.7 MBq (100 microCi).
- b) For well-logging applications with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of Sections 351.1050, 351.1060 and 351.1070 of this Part.
- c) For well-logging applications without a surface casing for protecting fresh water aquifers, use of the ECS is subject to the requirements of Sections 351.40, 351.1050, 351.1060, 351.1070, 351.3030(b)(2) and 351.5010 of this Part.

(Source: Added at 28 Ill. Reg. 12643, effective August 27, 2004)

Section 351.3027 Well-logging 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 sealed source becoming lodged in the well. The procedure shall be approved by the Agency pursuant to Section 351.2020(l) of this Part.

(Source: Added at 28 Ill. Reg. 12643, effective August 27, 2004)

Section 351.3030 Subsurface Tracer Studies

- a) All personnel handling radioactive tracer material shall be required to use protective gloves, protective clothing and equipment which prevents the spread of contamination. Precautions shall be taken by the licensee or registrant to prevent ingestion or inhalation of radioactive material.
- b) No licensee or registrant shall cause the injection of radioactive material into potable aquifers without specific license authorization issued by the Agency pursuant to 32 Ill. Adm. Code 330.250. The authorization will be issued only if:
 - 1) The applicant's proposed procedures will prevent tracer concentrations at the most exposed drinking water source or public water supply inlet from

exceeding the Illinois Environmental Protection Agency's drinking water quality standards in 35 Ill. Adm. Code 604; and

- 2) The applicant's proposed procedures will be performed:
 - A) On an underground injection well for which a U.S. Environmental Protection Agency underground injection control program permit has been issued pursuant to 40 CFR 124 or 40 CFR 144 revised as of July 1, 1990, or pursuant to 35 Ill. Adm. Code 705 or 62 Ill. Adm. Code 240; or
 - B) On a well for which the Illinois Environmental Protection Agency has otherwise approved a subsurface radioactive tracer study pursuant to 35 Ill. Adm. Code 704; or
 - C) On a well for which the Illinois Department of Natural Resources has otherwise approved a subsurface radioactive tracer study pursuant to 62 Ill. Adm. Code 240.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.3040 Particle Accelerators

No licensee or registrant shall 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 32 Ill. Adm. Code 340.210 and 340.310, as applicable, are met.

(Source: Amended at 18 Ill. Reg. 3344, effective February 22, 1994)

Section 351.4010 Radiation Surveys

- a) Radiation surveys and/or calculations shall be made and recorded for each area where radioactive materials are stored.
- b) Radiation surveys and/or calculations shall be made and recorded for the radiation levels in occupied positions and on the exterior of each vehicle used to transport radioactive material. The surveys and/or calculations shall include each source of radiation or combination of sources to be transported in the vehicle.
- c) After removal of the sealed source from the logging tool and before departing the jobsite, the logging tool detector shall be energized, or a radiation survey meter used, to assure that the logging tool is free of contamination.
- d) If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of the sealed source could be damaged by the

operation, the licensee shall conduct a radiation survey, including a contamination survey, during and after the operation.

- e) Radiation surveys shall be made and recorded at the jobsite or wellhead for each tracer operation, except those using hydrogen-3, carbon-14 and sulfur-35. These surveys shall include measurements of radiation levels before and after the operation.
- f) Records required pursuant to subsections (a) through (e) of this Section shall include the dates, the identification of individual(s) making the survey, the identification of survey instrument(s) used and an exact description of the location of the survey. Records of these surveys shall be maintained for inspection by the Agency for 5 years after completion of the survey.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.4020 Documents and Records Required at Field Stations

Each licensee or registrant shall maintain, for inspection by the Agency, the following documents and records for the specific devices and sources used at the field station:

- a) Appropriate license, certificate of registration or equivalent document issued by the Nuclear Regulatory Commission, an Agreement State or Licensing State;
- b) Operating and emergency procedures required by Section 351.2020 of this Part;
- c) 32 Ill. Adm. Code: Chapter II, Subchapters b and d;
- d) Records of the latest survey instrument calibrations pursuant to Section 351.1040 of this Part;
- e) The dates of the latest tests for leakage or contamination performed on the sealed sources and the results of the tests;
- f) Quarterly inventories required pursuant to Section 351.1060 of this Part;
- g) Utilization records required pursuant to Section 351.1070 of this Part;
- h) Records of inspection and maintenance required pursuant to Section 351.1100 of this Part; and
- i) Survey records required pursuant to Section 351.4010 of this Part.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.4030 Documents and Records Required at Temporary Jobsites

Each licensee or registrant conducting operations at a temporary jobsite shall have the following documents and records available at that site for inspection by the Agency:

- a) Operating and emergency procedures required by Section 351.2020 of this Part;
- b) Survey records required pursuant to Section 351.4010 of this Part for the period of operation at the site;
- c) Evidence of current calibration for the radiation survey instruments in use at the site;
- d) The licensee's radioactive material license, including all appropriate amendments;
- e) When operating in the State under reciprocity as provided for in 32 Ill. Adm. Code 330.900, a copy of the appropriate license, certificate of registration or equivalent documents; and
- f) The dates of the latest tests for leakage or contamination performed on the sealed sources and the results of the tests.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.5010 Notification of Incidents, Abandonment and Lost Sources

- a) Notification shall be made to the Agency whenever an incident has occurred as described in 32 Ill. Adm. Code 340.1220 or 340.1230. Notification shall also be made to the Agency whenever a source is leaking or contaminated in accordance with 32 Ill. Adm. Code 340.1260 or stolen, missing or lost, other than in downhole logging operations, in accordance with 32 Ill. Adm. Code 340.1210.
- b) Whenever a sealed source is separated from the logging tool and is lost downhole, the licensee shall notify the Agency immediately by telephone prior to beginning source recovery operations.
- c) Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee or registrant shall:
 - 1) Monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations; and
 - 2) Notify the Agency immediately by telephone if radioactive contamination is detected at the surface or if the source is likely to have been ruptured.
- d) When efforts to recover the radioactive source are not successful, the licensee or

registrant shall:

- 1) Advise the well operator of the regulations of the Illinois Emergency Management Agency regarding abandonment and the method of abandonment, which shall include:
 - A) The immobilization and sealing in place of the radioactive source with a cement plug;
 - B) The means to prevent inadvertent intrusion on the source, unless the source is not accessible to any subsequent drilling operations, such as setting of a whipstock or other deflection device; and
 - C) The mounting of a permanent identification plaque, at the surface of the well, containing the appropriate information required by subsection (g) of this Section;
 - 2) Notify the Agency immediately by telephone, and by mail within 10 calendar days, giving the circumstances of the loss and requesting approval of the adopted abandonment procedures; and
 - 3) File a written report with the Agency within 30 days of the abandonment, setting forth the following information:
 - A) Date of occurrence and a brief description of attempts to recover the source;
 - B) A description of the radioactive source involved, including radionuclide, quantity, and chemical and physical form;
 - C) Surface location and identification of well;
 - D) Results of efforts to immobilize and seal the source in place;
 - E) Depth of the radioactive source;
 - F) Depth of the top of the cement plug;
 - G) Depth of the well; and
 - H) Information contained on the permanent identification plaque.
- e) The Agency will provide written approval of the request by the licensee pursuant to subsection (d)(2) of this Section if the Agency determines that accepted industry methods for recovery have been unsuccessful and the proposed abandonment procedures satisfy the requirements of subsection (d)(1) of this

Section.

- f) If the licensee believed there was an immediate threat to public health and safety and the licensee implemented abandonment procedures before receiving Agency approval to implement abandonment procedures, the licensee shall notify the Agency immediately by telephone, and by mail within 10 calendar days, giving the circumstances and reasons why an immediate threat to public health and safety was determined to exist and who made the determination.
- g) Whenever a sealed source containing radioactive material is abandoned downhole, the licensee shall provide a permanent plaque for posting the well or well-bore. This plaque shall:

AGENCY NOTE: An example of a suggested plaque is shown in Appendix B of this Part.

- 1) Be constructed of long-lasting material, such as stainless steel or monel; and
- 2) Contain the following information engraved on its face:
 - A) The word "CAUTION";
 - B) The radiation symbol without the conventional color requirement;
 - C) The date of abandonment;
 - D) The name of the well operator or well owner;
 - E) The well name and well identification number(s) or other designation;
 - F) The sealed sources by radionuclide and quantity of activity;
 - G) The source depth and the depth to the top of the plug; and
 - H) An appropriate warning, depending on the specific circumstances of each abandonment.

AGENCY NOTE: Appropriate warnings may include: "Do not drill below plug back depth"; "Do not enlarge casing"; or "Do not re-enter the hole" followed by the words, "before contacting the Illinois Emergency Management Agency".

- h) The licensee or registrant shall notify the Agency immediately by telephone, and by mail within 10 calendar days, if the licensee knows or has reason to believe

that radioactive material has been lost in or to an underground potable water source. The notice shall designate the well location and shall describe the magnitude and extent of loss of radioactive material, assess the health and environmental consequences of the loss and explain efforts planned or being taken to mitigate these consequences.

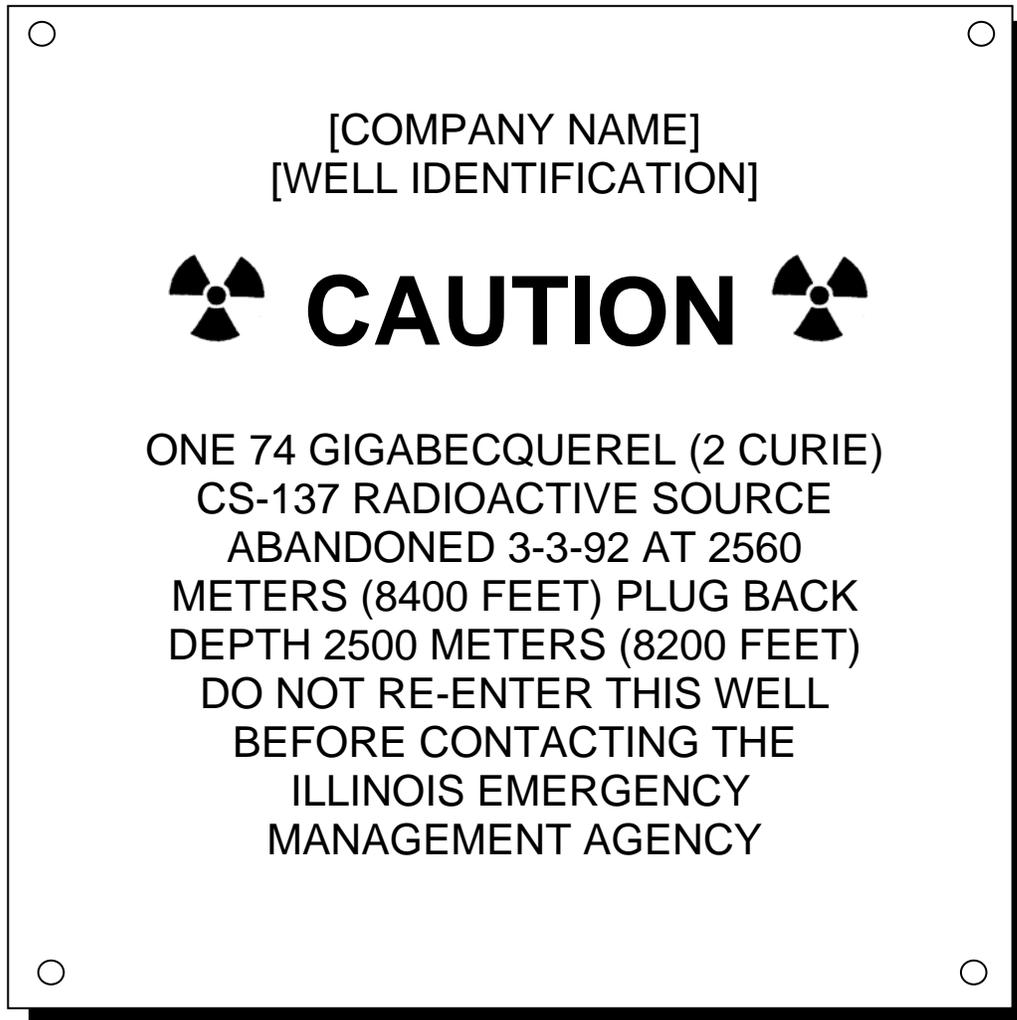
(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)

Section 351.APPENDIX A Subjects To Be Included In Training Courses For Logging Supervisors

- I) Fundamentals of Radiation Safety
 - A) Characteristics of radiation
 - B) Units of radiation dose and quantity of radioactivity
 - C) Significance of radiation dose
 - 1) Radiation protection standards
 - 2) Biological effects of radiation dose
 - D) Levels of radiation from sources of radiation
 - E) Methods of minimizing radiation dose
 - 1) Working time
 - 2) Working distances
 - 3) Shielding
- II) Radiation Detection Instrumentation to be Used
 - A) Use of radiation survey instruments
 - 1) Operation
 - 2) Calibration
 - 3) Limitations
 - B) Survey Techniques
 - C) Use of personnel monitoring equipment
- III) Equipment to be Used
 - A) Handling equipment
 - B) Sources of radiation
 - C) Storage and control of equipment

- D) Operation and control of equipment
- IV) The Requirements of Pertinent Federal and State Regulations
- V) The Licensee's or Registrant's Written Operating and Emergency Procedures
- VI) The Licensee's or Registrant's Record Keeping Procedures

Section 351.APPENDIX B Example of Plaque for Identifying Wells Containing Sealed Sources Containing Radioactive Material Abandoned Downhole



The size of the plaque should be convenient for use on active or inactive wells, e.g., an 18-centimeter (7-inch) square and 3 mm ($\frac{1}{8}$ inch) thick. Letter size of the word "CAUTION" should be approximately twice the letter size of the rest of the information, e.g., 12-millimeter ($\frac{1}{2}$ -inch) and 6-millimeter ($\frac{1}{4}$ -inch) letter size, respectively. Quantities and distances may be expressed either in SI units or in special and English units or in dual units.

(Source: Amended at 28 Ill. Reg. 12643, effective October 1, 2004)