



Texas Department of Health

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June 18, 1999

UNITED STATES NUCLEAR REGULATORY COMMISSION
ATTN PAUL H LOHAUS DIRECTOR
OFFICE OF STATE PROGRAMS
MAIL STOP O3H20
WASHINGTON D C 20555

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OSP

Dear Mr. Lohaus:

This letter is in response to your request for clarification of the acceptability of an engineers report for confirmation of appropriate well plugging and abandonment of the wells located in the 80 acre Boots/Brown Production Area (USX Corporation Radioactive Material License L02449). Ordinarily the licensee will submit copies of the letters from the Texas Natural Resources Conservation Commission (Commission) confirming that groundwater cleanup is completed and that the UIC permit has been voluntary revoked after all wells have been appropriately plugged. However, in some cases, we will accept a copy the engineers report sent to the Commission to prove that wells have been properly plugged. This is done to expedite processing termination requests or in the case that the letters from the Commission are not readily available, due to the transfer of the Uranium Program from the Commission back to the Texas Department of health. In the future, to avoid confusion in our requests for concurrence to you, we will be requiring copies of the Commission letters from all licensees. I have attached a copy of our Reg Guide 5.10, which discusses the type of information we request from a licensee when submitting a license termination request to us. I hope this clarifies this matter for you.

If you have any questions, please call me at (512) 834-6688 extension 2208.

Sincerely,

Eugene (Gene) Forrer
Chief, Uranium Licensing Project
Division of Licensing,
Registration, and Standards
Bureau of Radiation Control

Attachment





BUREAU OF RADIATION CONTROL
REGULATORY GUIDE
TEXAS DEPARTMENT OF HEALTH



REGULATORY GUIDE 5.10

GUIDELINES FOR CONDUCTING CLOSE OUT SURVEYS OF OPEN LANDS
AND REQUESTING RELEASE FOR UNRESTRICTED USE

I. Introduction

This document may be used as a guide for selecting sampling methods, performing surveys, and documenting the decontamination of open lands which have been restricted or potentially contaminated due to the use of radioactive material. Guidelines are also given for data which should be provided to the Texas Department of Health (Agency) when the licensee requests release of open lands for unrestricted use. This guide applies primarily to the release of lands which have been involved with in-situ uranium recovery operations.

Before beginning surveying and sampling of the open lands to be released, the licensee should submit a surveying and sampling plan to the Agency, based upon the guidelines in this document.

II. Standards

The Agency has adopted soil limits, based on dry weight, averaged over any 100 m² of area, for radium-226 and radium-228 in 25 Texas Administrative Code (TAC) §289.202(ddd)(3) as follows:

- A. 5 pCi/g (0.185 Bq/g), averaged over the first 15 cm of soil below the surface; and
- B. 15 pCi/g (0.555 Bq/g), averaged over 15 cm thick layers of soil more than 15 cm below the surface.

Agency has adopted soil limits, based on dry weight, averaged over any 100 m² of area, for natural uranium with no daughters present in 25 Texas Administrative Code (TAC) §289.202(ddd)(5) as follows:

- A. 30 pCi/g (1.11 Bq/g), averaged over the top 15 cm of soil below the surface; and
- B. 150 pCi/g (5.55 Bq/g), average concentration at depths greater than 15 centimeters below the surface so that no individual member of the public will receive an effective dose equivalent in excess of 100 mrem (1 mSv) per year.

TEXAS DEPARTMENT OF HEALTH, BUREAU OF RADIATION CONTROL, REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public acceptable methods of implementing specific parts of 25 Texas Administrative Code §289, and of Texas Regulation for Control of Radiation to delineate techniques used by the staff in evaluating problems or postulated accidents, or to provide guidance to applicants, licensees, or registrants. Regulatory Guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the Bureau of Radiation Control, Texas Department of Health, to make necessary determinations to issue or continue a license or certificate of registration.

Comments and suggestions for improvements in these Regulatory Guides are encouraged at all times and they will be revised, as appropriate, to accommodate comments and to reflect new information or experience. Comments should be sent to the Deputy Director of Standards, Division of Licensing, Registration, and Standards, Branch, Bureau of Radiation Control, Texas Department of Health 1100 West 49th Street, Austin, Texas 78756.

Requests for single copies of issued guides (which may be reproduced) should be made in writing to the Bureau of Radiation Control, Texas Department of Health, 1100 West 49th Street, Austin, Texas 78756.

The Agency took a conservative approach in establishing soil contamination limits for other radionuclides by converting the units in 25 TAC §289.202(ggg)(2)(F)(Table II, Column 2) from microcuries per milliliter to microcuries per gram. With a water sample, it is assumed that the concentration of the contaminant is evenly distributed in the volume of water sampled. Soil tends to attenuate the movement of the contaminant and concentrates the contaminant in a smaller volume. If all of the radioactive material per gram of soil were released to water, the unrestricted water release limits would not be exceeded. Averaging over a soil volume of 100 m² by 15 cm in depth is considered adequate for radium-226. Therefore, it is practicable for the Agency to use the same averaging technique for natural uranium concentrations. The 100 m² by 15 cm in depth sampling method may be used for soils contaminated with natural uranium and the associated daughter products resulting from uranium recovery operations. For all other radionuclides, averaging should be over a soil volume of 1 meter by 1 meter by 15 cm in depth. Surveys must be conducted in accordance with 25 TAC §289.202. The licensee should realize that the standards used are decontamination limits. The licensee should adhere to the concept of "As Low As Reasonably Achievable" (ALARA).

III. Instrumentation

The licensee should determine which type of instrumentation is most sensitive to the types and energies of radiation to be detected. When performing close out surveys, the Agency uses 1 inch by 1 inch sodium iodide probes in conjunction with an appropriate rate meter for surveying open lands which have been involved in uranium recovery operations. However, the licensee may choose other appropriate instrumentations such as micro roentgen meters. The instrument used should be appropriately calibrated and a daily efficiency checks should be performed to assure the instrument is working properly. The licensee should also consider the distance at which the instrument is able to detect a significantly elevated area (hot spot) and the appropriate height above the ground at which the probe should be held. A hot spot is considered to be an area with a reading equal to or greater than twice background or an area with a radionuclide concentration sufficiently high such that the average for the 100 m² area will exceed the soil contamination limits.

IV. Survey and Sampling Procedures

A. Preliminary Survey Design

The licensee's preliminary survey area should be delineated with optimum grid spacing for the size of area to be released. In no case should any grid spacing be greater than 10 meters. Each grid line should be surveyed along the entire length of the line. Readings should be recorded at no more than 10-meter intervals. Although instrument readings may be documented every few meters, the response of the instrument should be monitored continuously while surveying along the grid lines.

Background radiation levels should be established by surveying areas adjacent to the survey area which are not affected by facility operations. The background level established by the licensee is subject to Agency approval. If readings taken in the survey area cannot be distinguished from the established background level, those readings should be recorded as being the same as background.

The licensee's survey should be on a grid spacing small enough to assure the Agency that a hot spot has not been missed. Hot spots should be physically marked and recorded.

Should the licensee decide to leave a hot spot, the area of contamination should be documented and an explanation submitted to the Agency justifying why the licensee has decided not to decontaminate the area.

If no hot spots are encountered during the preliminary survey, the licensee may use the preliminary survey as its final survey. If the preliminary survey is to be used as the final survey, random samples should be collected from the survey area, with a minimum of three samples per acre. Any hot spots found during the preliminary survey may be decontaminated after the preliminary survey. Also, a final survey need only document the decontamination of those areas found to be contaminated in the preliminary survey. The licensee should verify that soil contamination does not exceed the limits specified in TAC §289.202(ddd).

B. Sampling Procedures

The licensee's sampling program should be comprehensive, covering the entire area to be released. If the licensee chooses not to decontaminate, the following areas should be sampled:

1. Any area with survey readings which are greater than twice background;
2. Any area which has an average reading of one and one-half times the background reading and encompasses an area of 50 m² or greater.

The remaining discussion of the sampling procedures will be directly related to uranium recovery operations. However, other licensees may use similar procedures over the sampling area of concern.

When sampling an area, the samples collected should be representative of the entire area. If the contaminated area covers 50 percent of the 100 m² area, then 50 percent of the samples collected should be from the contaminated area.

The licensee may average the concentrations of radium-226 and natural uranium over the first 15 cm of soil below the surface in a 100 m² area. In soil more than 15 cm below the surface, the concentrations may be averaged in 15 cm layers in a 100 m² area. The licensee should, at a minimum, sample the initial 15-cm layer (0-15 cm), and the second 15cm layer (15-30 cm) if concentrations in the initial 15cm layer indicate deeper sampling is necessary. A minimum of five samples from each layer should be collected within the 100 m² area.

When sampling a contaminated area which is less than 100 m² the hot spot must be sampled as part of a single 100 m² area. The contaminated area may not be split into two sections which are located in two separate 100 m² areas. Figure 1 depicts an acceptable method of sampling and Figure 2 depicts an unacceptable method of sampling such a hot spot.

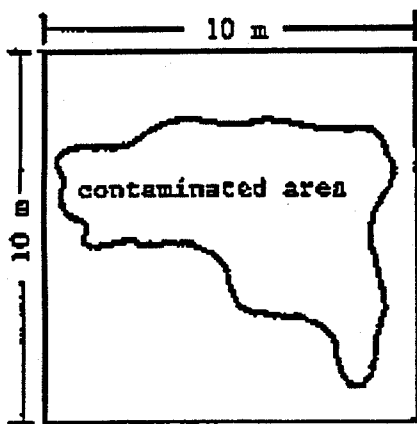


Figure 1

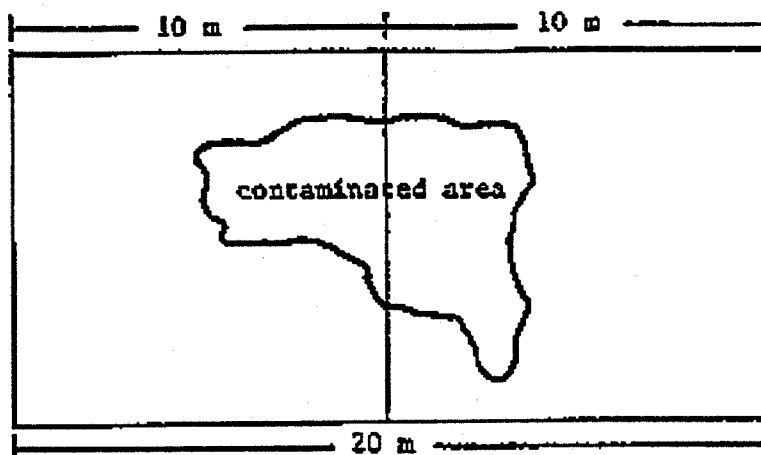


Figure 2

However, if the contamination occurs in narrow strips, 1 meter wide or less, the Agency may allow the licensee to divide the contaminated area into more than one sampling area as depicted in Figure 3. The dimensions of the sampling area should not be narrower than 5 meters on any boundary.

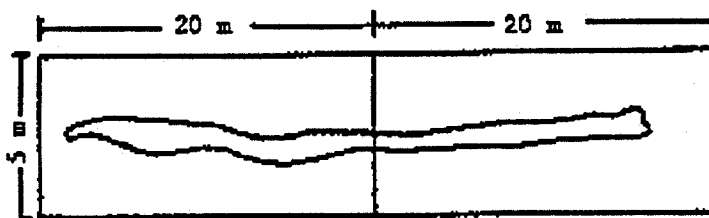
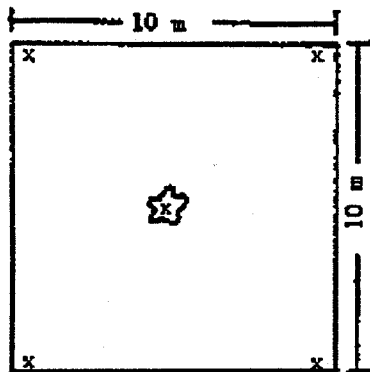


Figure 3

If a small hot spot is encountered (less than 1 meter in diameter) then that hot spot should be placed in the center of the 100 m² sampling area. One sample should be collected from the hot spot and four additional samples collected by sampling 1 meter toward the center from each corner of the 100 m² area. Again, the initial 15-cm layer (0-15 cm) should be sampled, and the second 15-cm layer (15-30 cm) if necessary. This sampling technique is depicted in Figure 4. If numerous small hot spots occur in close proximity to one another, they should be sampled



x denotes sample location

Figure 4

as one 100 m² area, and a more widely distributed array of samples should be collected from such an area. Figure 5 is an example of an acceptable method. Figure 5 indicates nine samples collected from the 100 m² area. The licensee may choose fewer or additional sampling locations within the 100 m² sampling area.

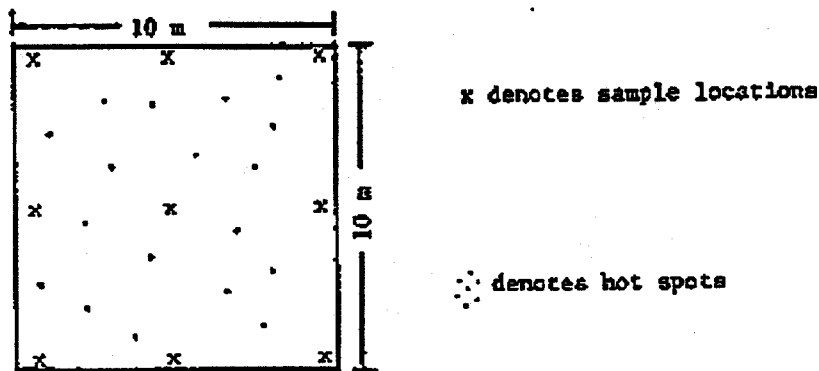


Figure 5

All areas which are sampled should be accurately identified on a scaled map. The samples should then be submitted to a qualified laboratory for analyses. The Agency recommends that each sample be analyzed separately. After the analyses of the samples are completed, the results can be averaged with results of other samples collected from the same sampling area and the same depth. The separate analysis of each sample allows a more precise determination as to the highest concentrations that will be released.

V. Request For Agency Confirmation Survey and Sampling.

When the licensee is confident that the area of concern will be acceptable for release for unrestricted use, a written request asking for release for unrestricted use must be submitted to the Agency. The information discussed in this regulatory guide should be submitted in a comprehensive report accompanied by survey and sample results which show that contamination is less than the limits specified in TAC §289.202(ddd).

If the area to be released has been involved in uranium mining or milling the Agency will perform a survey before a release will be authorized. If the area involves a well field or part of a well field, the Agency will also perform a survey before a release will be authorized. In all cases, the well field or portions thereof must be considered restored and the wells properly plugged by the Texas Natural Conservation Commission (Commission) before the Agency will consider releasing the surface for unrestricted uses

The licensee should submit as much information as possible to aid the Agency in performing an efficient confirmatory survey and sampling program. Submitting pre-operational data will help the Agency determine the background for the area. Should pre-operational data not be available, background radiation levels should be established as indicated in Section IV.A. of this document.

Operational data, such as maps of non-routine contamination, including spills and pipe leaks, will aid the Agency in determining areas that might need closer attention. Documentation of cleanup activities during operation, and sample results before and after cleanup should be submitted to the Agency.

Documentation of the survey results should be submitted to the Agency in the form of a scaled survey map which provides coordinates of the area surveyed. The map should also identify all structures in that area.

In order for an area to be released, soil contamination must not exceed the limits specified in TAC §289.202(ddd). The licensees release request should include surveys and sample results demonstrating that these limits have been met.