



**APPLICATION GUIDELINES FOR RADIATION CONTROL PERMITS FOR  
DISCHARGES OF RADIOACTIVE MATERIAL IN EFFLUENTS TO GROUND OR  
SURFACE WATER**

May 2022

**A. PURPOSE OF GUIDELINES**

These guidelines describe the information needed by the New York State Department of Environmental Conservation staff to evaluate an application for a permit to discharge licensed radioactive material to the environment via effluents to ground or surface water. This type of permit is provided for under Subpart 380-3 of 6 NYCRR Part 380, "Rules and Regulations for Prevention and Control of Environmental Pollution by Radioactive Materials."

These guidelines apply to discharges to ground or surface water. For discharges of radioactive material to municipal sanitary sewer systems, Part 380 states that licensed radioactive material may be disposed of by release into sanitary sewer systems if the conditions specified in Section 380-4.2 are met. Therefore, you do not need specific approval from this Department for the disposal of certain categories of radioactive waste by release into sanitary sewer systems if you comply with the Part 380 regulations. Although the Department does not issue permits for such disposals, under Subpart 380-6 you are still required to evaluate the quantity and concentration of radioactive material discharged to sanitary sewer systems, and Subpart 380-8 requires you to maintain records of all such discharges.

You should review your facility's radioactive materials use and waste disposal procedures to determine if your facility generates waste that may be disposed of by release into sanitary sewers. Be aware that on-site wastewater treatment systems, including septic systems, are not municipal sanitary sewer systems. Therefore, all licensed radioactive material discharges from such systems, whether discharged to ground or surface water via an on-site septic tank, leach field, or waste water treatment plant, will only be authorized by the Department under the required Part 380 permit. In this case, follow the instructions provided in these guidelines.

You should carefully study the Part 380 regulations and these guidelines before preparing the letter of application. The Part 380 regulations require you to develop and implement procedures that will ensure compliance with the applicable laws and regulations. The Department will request additional information when necessary to provide reasonable assurance that you have established a radiation safety program adequate to minimize radioactive discharges to the environment. The documents you submit in support of your application will be made part of the permit. Therefore, once the permit is issued, you must keep copies of those documents on file with the permit.

## **B. APPLICABLE REGULATIONS**

The regulations pertaining to this type of radiation control permit are found in Title 6, Chapter 4, Part 380 of the New York Code of Rules and Regulations (6 NYCRR Part 380). The statutory authority for the rules and regulations is found in the New York State Environmental Conservation Law (Articles 1, 3, 17, 19, 27, 29, and 37). Discharges to ground and surface water are also regulated under 6 NYCRR Parts 750-758, State Pollutant Discharge Elimination System (SPDES).

The administration of the permit, including modifications to any conditions therein, will be subject to Uniform Procedures (6 NYCRR Part 621). The information submitted in the application will be subject to Public Access to Records (6 NYCRR Part 616), which includes Section 616.7 regarding management of records containing trade secrets. The permit application will also be subject to State Environmental Quality Review (6 NYCRR Part 617).

For the purposes of maintaining compliance with the above-mentioned regulations, the definition of “annual” has been adopted from *Black's Law Dictionary* to mean: **annual** *adj.* (14c) **1.** Occurring once every year; yearly <**annual** meeting>. **2.** Of, relating to, or involving a period of one year\* <**annual** income>. (\* According to *Merriam-Webster's* dictionary, one year is defined as **365 days**.) Therefore, all commitments/requirements with the frequency of “annual” will be expected to be performed no later the 365 days from the previous performance date.

## **C. FILING AN APPLICATION**

Your letter of application for a Part 380 permit should provide all the information requested in these guidelines. A complete application for a permit must contain information which thoroughly describes the proposed radioactive materials use, handling, and discharge procedures. According to Subpart 380-3, the submitted information must describe the proposed operations in sufficient detail to

(1) enable the Department to assess the nature and extent of any potential environmental impact;

(2) demonstrate that the proposed discharge of licensed material will comply with the requirements of Part 380; and

(3) provide adequate justification for the proposed discharge of radioactive material to the environment.

The Department may approve the radionuclide discharge levels proposed in the letter of application if the applicant demonstrates the following:

- (1) that radionuclide discharges will be limited, as required by Subpart 380-5, so that radiation dose limits for individual members of the public will not be exceeded, and that doses will be maintained as low as reasonably achievable (ALARA); and
- (2) that the applicant has made every reasonable effort to minimize the discharge of radioactive material to the environment, as required by Subpart 380-7.

Mail an original and two copies of the letter of application to the Department's Regional Permit Administrator at the appropriate Regional Office (see page 16). The Regional Permit Administrator will forward a copy of the application to each involved program in the Department for technical review (e.g., the Radiation Section, Division of Water, etc.).

You should retain one copy of the letter of application, with all attachments, since the permit will require as a condition that you follow the statements and representations set forth in the application and any supplements to it. When issued, the Part 380 permit will cross-reference the SPDES permit issued by the Department pursuant to 6 NYCRR Parts 750-758.

If you have any questions regarding the preparation of the Part 380 permit application, you may contact the Department's Radiation Section for assistance at (518) 402-8652.

#### **D. CONTENTS OF THE APPLICATION**

A complete application for a permit must satisfy the requirements of Section 380-3.2. Therefore, the application should contain the following information:

1. General Information and Identification of Applicant

- a. Applicant name
- b. Mailing address
- c. Location/address of project/facility
- d. County & village
- e. Radiation Safety Officer's (RSO) name and telephone number, and who should be contacted in the RSO's absence
- f. A detailed area map showing roadways from a major state highway to the project/facility location
- g. A copy of those portions of the applicant's radioactive materials license that show the license number and expiration date, list of radioactive materials authorized to possess, and a description of authorized use of radioactive material  
  
If the radioactive materials license has not yet been obtained, confirm that the above information will be submitted to the Department when the license is received.
- h. Federal social security account number and/or federal employer identification number
- i. An organizational chart

2. Source and Nature of Radionuclide Discharge

For each radionuclide in the effluent, provide a general description of

- a. The process involving that radionuclide that generates, or has the potential to generate, a discharge to the ground or surface water
- b. The properties of the effluent, including isotopic and chemical composition, and physical form

3. Discharge Points

Provide the location and identity of each discharge point, with a simple diagram

of the overall wastewater handling system into which radionuclides are released, from the point of generation to the discharge point.

Provide a map or sketch of the area showing the discharge points, site boundary, and the receiving water body. Identify the receiving water body and provide a statement whether or not the receiving water body is a public water supply. Where applicable, identify the nearest downstream water intake on the waterbody, and for tidal estuaries and lakes, identify the nearest upstream water intake.

4. Effluent Flow Rates

- a. State the effluent flow rate through the discharge point
- b. Submit a copy of the procedures to be used for determining the volumetric flow rate (gpm) through each discharge point. These procedures should include a complete description of
  - (i) How this flow rate will be measured
  - (ii) The measuring equipment to be used
  - (iii) The frequency of instrument calibration
  - (iv) The frequency of flow rate checks
  - (v) Calculations performed to determine the total annual volume of effluent discharged (ml/yr)
  - (vi) How records of flow rate checks and volumetric flow rate calculations will be reviewed and maintained

5. Discharge Treatment

Describe any effluent treatment system specifically designed to remove radioactive material that will be used to minimize the discharge of radionuclides to the environment. The description should include

- a. A diagram of the effluent treatment system
- b. The date of installation
- c. The location of the system

- d. The efficiency of the system for removal of radionuclides and a description of how this efficiency was determined
- e. The treatment capacity of the system
- f. How the system will be maintained
- g. How wastes produced during treatment will be disposed of

6. Radionuclides to be Discharged

For each discharge point, submit a list of all radionuclides to be discharged. Provide an estimate of the total activity and average concentration of each radionuclide to be discharged in one year. Include all calculations and assumptions used to support this estimate.

If effluent treatment will be used to minimize the discharge of radionuclides to the environment (as addressed in item 5 above), provide an estimate of radionuclide concentration in the effluent both before and after treatment.

Note: The radionuclide discharge estimates provided in the application will be used by the Department in establishing appropriate radionuclide discharge limits in the permit.

7. Evaluation of Discharges

Subpart 380-6 requires you to make surveys that are necessary to comply with the Part 380 regulations and that are reasonable to evaluate radiation levels, concentrations, or quantities of radioactive materials. Subpart 380-6 also requires that instruments and equipment used for quantitative radiation measurements be calibrated annually.

"Survey" is defined in Subpart 380-2 as an evaluation of the radiological conditions incident to the presence of radioactive material, and, when appropriate, includes measurements or calculations of levels of radiation, concentrations, or quantities of radioactive material present. Thus, "survey" includes keeping track of discharges through inventory of radioactive material throughout, effluent monitoring, and sampling of discharges.

You are required to keep track of how much radioactive material is discharged to the environment, using one or more appropriate methods to evaluate radionuclide discharges. Depending on the isotope, form, quantity of radioactive material

discharged, and method of discharge, one or more of the methods listed below may be appropriate for your facility.

Specify the survey method(s) to be used to evaluate discharges (i.e., mass balance, continuous monitoring, effluent sampling), and submit a copy of the survey procedures to be used. Your procedures should include the following:

- a. If the **mass balance method** is to be used, include a description of the radioactive material accounting procedures:
  - (i) Describe how you will determine the mass balance (this will be your survey). Indicate how records of this determination (your survey results) will be maintained. Explain how these results will be used to estimate radionuclide activity and concentration in the effluent, including all calculations.
  - (ii) Indicate how frequently records of mass balance determinations and discharge calculations will be generated and reviewed. The procedures for maintaining records of surveys should ensure that a running total of the quantity and average concentration of each radionuclide discharged is maintained, and that this record undergoes appropriate and timely review to ensure that permit limits will not be exceeded.
- b. If the **continuous monitoring method** is to be used, include a description of the effluent monitoring system:
  - (i) Identify the in-line instrument to be used, detector type, range, frequency of instrument calibration, alarm set point, how the instrument readout is monitored and/or recorded, and the location of the monitor, with diagram.
  - (ii) Describe how records of effluent monitoring results will be maintained, and show how these results will be used to estimate radionuclide activity and concentration in the effluent, including all calculations.
  - (iii) Indicate how frequently records of effluent monitoring results and discharge calculations will be generated and reviewed. The procedures for maintaining records of surveys should ensure that a running total of the quantity and average concentration of each radionuclide discharged is maintained, and that this record undergoes appropriate and timely review to ensure that permit limits will not be exceeded.
- c. If the **effluent sampling method** is to be used, include a description of the

effluent sampling system:

(i) Identify the location of the sampling point and all other components of the sampling system, with diagram.

(ii) Specify the frequency at which samples will be collected and the effluent sample collection method to be used (i.e., continuous, intermittent, composite, grab). If a pump is to be used to collect the effluent sample, identify the manufacturer and the name and model number of the pump, the pump flow rate, and the frequency of calibration.

(iii) Describe the method of sample analysis, the detector used, its efficiency and minimum detectable activity, and how the instrument is calibrated. Indicate whether the sample is analyzed in-house or sent out to a contracted analytical laboratory.

(iv) Describe how records of sample analysis results are maintained, and how these results are used to estimate radionuclide activity and concentration in the effluent, including all calculations.

(v) Indicate how frequently records of effluent sampling results and discharge calculations will be generated and reviewed. The procedures for maintaining records of surveys should ensure that a running total of the quantity and average concentration of each radionuclide discharged is maintained, and that this record undergoes appropriate and timely review to ensure that permit limits will not be exceeded.

#### 8. Potential for Radionuclide Reconcentration

Submit an evaluation of the potential for radionuclide reconcentration, whether radionuclides in effluents to water will be sent through a wastewater treatment system or directly discharged to the ground or surface water.

- a. If wastewater containing radionuclides will be sent through on-site wastewater treatment (i.e., septic tank, sewage treatment plant, lagoons) prior to discharge to the environment, describe the wastewater treatment system, and include a simple diagram.

Provide an analysis of the potential disposition of radionuclides in the wastewater sent to the wastewater treatment system, including

(i) The percentage of each radionuclide expected to be discharged in the liquid effluent from the treatment system

(ii) The percentage of each radionuclide expected to be collected in the



sludge

(iii) The concentration of each radionuclide expected in the sludge

(iv) A description of sludge disposal, including:

- (a) An estimate of the total volume of sludge expected to be disposed of per year
- (b) The frequency or rate at which sludge will be removed from the treatment system
- (c) The method of disposal and location

(v) Procedures for sampling and analyzing the sludge prior to disposal, including the methods and instruments to be used and the frequency of sampling; specify the lower limit of detection to be achieved in analysis of samples

(vi) If the sludge is to be incinerated:

- (a) Indicate the concentration of each radionuclide expected in the ash
- (b) Describe how the ash is to be disposed of
- (c) Submit your procedures for sampling and analyzing the ash prior to disposal, including the methods and instruments to be used and the frequency of sampling; specify the lower limit of detection to be achieved in analysis of samples

- b. If radionuclides will be discharged to surface water, identify conditions that could contribute to reconcentration of radionuclides in the receiving waterbody. Evaluate the potential for radionuclide reconcentration in the aquatic environment (i.e., fish, benthic organisms, plants).
- c. In order to establish background values, the radiological characteristics of the receiving waterbody and/or wastewater treatment system should be evaluated prior to the initial discharge of radioactive material. Such an evaluation will establish the ubiquitous levels of radionuclides present prior to the commencement of operations. Provide an isotopic analysis of receiving waterbody sediments and/or wastewater treatment system sludge, as appropriate, for those isotopes for which you are applying for a permit to discharge.

9. Dose Limits to Members of the Public

Subpart 380-5 establishes radiation dose limits for individual members of the public. It requires that you conduct surveys of radiation levels in unrestricted areas in the environment and of radioactive materials in effluents released to unrestricted areas in the environment. The results of these surveys are used as the basis for demonstrating that your operations are conducted in such a way that public dose limits are met.

Subpart 380-5 also requires that compliance with the public dose limits be demonstrated by one of two methods. The two methods are described in section 380-5.2; one of the two methods must be used to demonstrate that your facility complies with the dose limits.

The simplest method is outlined in section 380-5.2(b)(2), and states that if the radionuclide concentration in the effluent from your facility is less than the effluent concentration value listed in Column 2, Table II of section 380-11.7, and if the external dose rate limit is met, you have demonstrated compliance. This method for demonstrating compliance should be used whenever possible.

For those facilities whose discharges exceed the effluent concentration value in Column 2, Table II of section 380-11.7, the method outlined in section 380-5.2(b)(1) must be used to demonstrate compliance with the dose limits.

You must clearly indicate which of the following two methods will be utilized to demonstrate compliance:

a. Method 1

Demonstrating that--

(i) the annual average concentrations of licensed material in effluents to water at the point of discharge do not exceed the values specified in the Part 380 regulations in Column 2, Table II of Subpart 380-11; and

(ii) if an individual were continually present in an unrestricted area (in the environment), the dose from external sources would not exceed 2 millirems in an hour and 50 millirems in a year.

Included in (i) above is the requirement that, if more than one radionuclide is released from the same discharge point, the sum of the ratios between the concentration of each radionuclide in the effluent and the

concentration for that radionuclide listed in Column 2, Table II of Subpart 380-11 must not exceed unity, as determined by the "sum-of-ratios" method described in Subpart 380-11.

b. Method 2

Demonstrating by measurement or calculation that the total effective dose equivalent (TEDE) to the individual likely to receive the highest dose does not exceed the annual 100 millirem dose limit.

Submit a demonstration that your discharges will be in compliance with the public dose limits. Describe how surveys results will be used to confirm this demonstration.

10. Release Minimization Program

Section 380-5.1 requires that disposals and discharges of licensed material to the environment be limited so that, in addition to meeting dose limits, doses to individual members of the public are as low as reasonably achievable (ALARA). Towards that end, Subpart 380-7 requires all permittees to develop, document, and implement a release minimization program for maintaining discharges of licensed material ALARA.

The release minimization program should be commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with Part 380. It is recognized that licensees are required to develop and implement a radiation protection program (ALARA program). Your release minimization program could be a part of your overall radiation protection program, or it may be maintained separately. In either case, the release minimization program should specifically address environmental discharges.

Your release minimization program should contain the following program elements:

- a. Management's formal policy commitment to maintaining public radiation doses due to environmental discharges ALARA, including the establishment of investigational levels for radionuclide discharges
- b. Analysis of trends in radionuclide usage and their effect on discharge levels, to evaluate adequacy and operation of process equipment, effluent treatment equipment, and operating procedures
- c. Establishment of personnel qualifications and worker training

requirements adequate to ensure that staff are competent to perform duties necessary to maintain compliance with the Part 380 regulations and the conditions of the permit

d. Establishment of survey and effluent monitoring program appropriate for the facility's discharges

e. Review of procedures, engineering controls, and process controls, including

(i) An analysis of the processes that result in radioactive releases to identify the steps in the process during which radioactive materials enter the effluent stream

(ii) An evaluation of procedures used and equipment involved to identify what improvements could be made to reduce the discharge of radioactive material

(iii) An evaluation of the option of installing effluent treatment equipment to reduce radionuclides in effluent discharges to the environment

(iv) For each improvement and effluent treatment equipment identified under (ii) and (iii) above, an identification of the modifications to operating and maintenance procedures, equipment, and facilities that have been considered, a determination of what modifications have been made, and a justification of any modifications that have been recommended but not implemented.

f. Annual review of the release minimization program content and implementation and documentation of the results of that review

Note: A copy of the U.S. Nuclear Regulatory Commission's Regulatory Guide 8.37, "ALARA Levels for Effluents at Materials Facilities," is enclosed to provide additional information.

## 11. Records

Subpart 380-8 requires records to be maintained of (a) all disposals and discharges, (b) the results of surveys, (c) all demonstrations of compliance with public dose limits, and (d) the discharge minimization program. Provide a copy of the record keeping procedures that will be used to comply with Subpart 380-8.

12. Reporting Requirements

Subpart 380-9 contains reporting requirements. Confirm that you will submit an annual discharge report by the end of each March of the year following the discharge, as required by Section 380-9.1. Also, confirm that you will comply with the Notification of Incidents requirements in Section 380-9.2.

13. State Environmental Quality Review Act (SEQR) Requirements

If you are applying for a new permit, or for the modification or renewal of an existing permit where there will be a material change or increase in radionuclide discharges, complete and sign Part I of the enclosed Short Environmental Assessment Form (SEAF) and submit it with the application.

Applications for permit renewals with no change in the magnitude of radionuclide discharges or discharge rates do not require the resubmission of a SEAF.

14. Signature

The letter of application should be dated and signed by the facility's radiation safety officer and the managerial agent. The managerial agent must be a representative of the corporation or legal entity who is authorized to make binding commitments on behalf of the applicant\* and must certify that the application contains information that is true and correct to the best of the signer's knowledge and belief. Unsigned applications will not be reviewed and will be returned for proper signature.

\*Note: The positions of the persons signing the application should be shown on the organizational chart submitted in response to item 1.

**E. PERMIT MODIFICATIONS**

Once you have been issued a permit, you must conduct your program in accordance with the statements, representations, and procedures contained in the permit application and supporting documents. Therefore, before you make any changes in facility operations (e.g., approved facilities, equipment, procedures, or radioactive materials to be discharged to the environment), you must first obtain a permit modification.

Your letter of application for a permit modification should identify the permit by number and should clearly describe the exact nature of the changes, additions, or deletions. References to previously submitted information and documents should be clear and specific, and must identify the pertinent information by date, page, and paragraph.

The requirements of SEQR must be met as described in item 13 of Section D of

this guide. Permit modification applications must be signed as described in item 14 of Section D and dated. You should retain one copy of the application, since the statements made in the application will be made part of the modified permit. File your application as directed in Section C of this guide.

#### **F. PERMIT RENEWALS**

Your permit will remain in effect after the expiration date only if the application for permit renewal has been submitted to the Department and determined to be complete at least 90 days prior to the expiration date. Therefore, the letter of application for permit renewal should be filed well before the expiration date. If the Department finds your application is incomplete, this will allow you sufficient time to prepare and submit the required information and have the application declared complete 30 days before the expiration date.

Renewal applications should contain up-to-date information about your current program, and must meet all regulatory requirements in effect at the time of renewal. If there have been any changes in your program since the last renewal of the permit, a detailed description of these changes must be submitted with the renewal application. The Department will evaluate the nature of those changes and determine if a new permit application will be required for permit renewal. If the Department determines that a new application is needed, a permit application must be prepared in accordance with Section D of this guide.

The permit renewal application must meet the requirements of SEQR as described in item 13 of Section D. Applications must be signed as described in item 14 and dated. You should retain one copy of the application, since the statements made in the application will be made part of the permit renewal. File your application as directed in Section C of this guide.

#### **G. REQUESTS FOR PERMIT DISCONTINUANCE**

When you cease discharges of radioactive material to the environment, you should request that the permit be formally discontinued. Note that an expired permit is not discontinued until the Department takes action to discontinue the permit. Permits will not formally be discontinued by the Department until the permittee has demonstrated that all potential sources of radionuclide discharges to the environment have been eliminated.

Your letter of request for permit discontinuance must be signed as described in item 14 of Section D and dated. The request should include survey results indicating the residual contamination levels of all components of the radioactive material discharge and/or treatment systems. Identify the disposition of all potential sources of radioactive material discharges. Also, submit a final discharge report in accordance with Section 380-9.1 and your permit in lieu of a final annual report. Under Section 380-10.4,

permittees must notify the Department of intent to vacate at least 30 days prior to relinquishing possession or control of premises that may have become contaminated with radioactive materials.

Be aware that if any planned decontamination and demolition activities have the potential to release radioactive materials to the environment, the permit may need to be modified prior to the final permit discontinuance, in order to address potential environmental discharges during these operations. In such instances, a letter of application for permit modification must be submitted, deemed complete, and the permit issued prior to initiating decontamination and demolition. File your request as directed in Section C of this guide.

Enclosures (2):

- 1) NRC Regulatory Guide 8.37
- 2) Short Environmental Assessment Form

**DEC Regions and Counties****Region 1**

Nassau and Suffolk

**Region 2**

New York City

**Region 3**Dutchess, Orange, Putnam, Rockland,  
Sullivan, Ulster, Westchester**Region 4**Albany, Columbia, Delaware, Green,  
Montgomery, Otsego, Rensselaer, Schenectady,  
Schoharie**Region 5**Clinton, Essex, Franklin, Fulton, Hamilton,  
Saratoga, Warren, Washington**Region 6**Herkimer, Jefferson, Lewis, Oneida, St.  
Lawrence**Region 7**Broome, Cayuga, Chenango, Cortland,  
Madison, Onondaga, Oswego, Tioga,  
Tompkins**Region 8**Chemung, Genesee, Livingston, Monroe,  
Ontario, Orleans, Schuyler, Seneca, Steuben,  
Wayne, Yates**Region 9**Allegheny, Cattaraugus, Chautauqua, Erie,  
Niagara, Wyoming**Regional Permit Administrator**SUNY @ Stony Brook  
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Stony Brook, NY 11790-3409  
(631) 444-0365 / [dep.r1@dec.ny.gov](mailto:dep.r1@dec.ny.gov)1 Hunters Point Plaza  
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