

WM-7802

BRANCH POSITION

UNITED STATES NUCLEAR REGULATORY COMMISSION

Fuel Processing & Fabrication Branch

FEB 27 1978

SUGGESTED CONTENTS OF APPLICATIONS  
FOR LICENSES AUTHORIZING SMALL SCALE OR RESEARCH AND  
DEVELOPMENT PROCESSING OF URANIUM ORES

A. INTRODUCTION

In order to process or refine ores containing by weight 0.05 percent or more of uranium, after removal from their place of deposit in nature, a USNRC Source Material License is required. An applicant for a license to receive, possess, and use source materials is required to provide detailed information on his proposed facilities, equipment, experience, and procedures. This information is used by the Commission in determining whether the applicant's proposed activities will, among other things, result in undue risk to the health and safety of the public. General guidance for filing an application is provided in §40.31 of 10 CFR Part 40, "Applications for Specific Licenses." The purpose of this enclosure is to provide specific guidance on the contents of an application for a USNRC Source Material License authorizing uranium ore processing on a small scale or for research and development purposes. The information in this enclosure is intended to provide instructive guidance and should not be considered as a substitute for a careful evaluation of the proposed program by the applicant or for assuring that the application clearly and adequately describes the radiation safety procedures that will be followed as well as the potential environmental impacts associated with the operation.

Changes to existing (licenses) programs require the issuance of an appropriate license amendment. An application for such an amendment should describe the proposed changes in detail.

B. FILING AN APPLICATION

An application for a small scale or a research and development uranium ore processing license should be filed using Form NRC-2 in accordance with the requirements specified in §40.31 of 10 CFR Part 40. As required by §40.31(f) of 10 CFR Part 40, an application should be filed nine months prior to commencing construction of the proposed facility. Applications may be filed with the Director for Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Applications may also be filed in person at the Commission's offices at 1717 H Street, N.W., Washington, D.C., or 7920 Norfolk Avenue, Bethesda, Maryland.

The Commission has adopted a statement of general policy and procedure entitled "Licensing and Regulatory Policy and Procedures for Environmental Protection," 10 CFR Part 51. This policy statement and §40.31(f) of 10 CFR Part 40 require the submittal of Environmental Reports by applicants for Nuclear Regulatory Commission (NRC) permits and licenses for certain facilities, including small scale or research and development facilities which perform uranium processing operations. Thus, any application for a uranium processing license must be accompanied by an Environmental Report. This report will contain information supplementing that already presented in Form NRC-2 and will be attached as an appendix to the application.

### C. CONTENTS OF AN APPLICATION

The application should contain the information specified in items 1 through 8 of Form NRC-2. The information required in items 9 through 14 of Form NRC-2 should be incorporated into the various items identified below. In discussing these items, a narrative form of presentation should be used. Each subject should be treated in sufficient depth to permit the Commission independently to determine whether the applicant's proposed activities will be conducted in accordance with USNRC rules and regulations.

#### 1.0 PROPOSED ACTIVITIES

This section should generally discuss the proposed activities. For example, such matters as expected longevity of the operation, chemical and physical form of ores to be processed, processing rate, total quantity to be processed, operating plans and schedules, etc., should be discussed.

#### 2.0 SITE DESCRIPTION

##### 2.1 Geography and Demography

###### 2.1.1 Geography

A geographic description of the area in which the facility is to be located should be provided, including: (1) maps showing the location of the site with respect to state, county, and local subdivisions, plus nearby inhabited areas; and (2) maps (topographic if available) showing the proposed facility perimeter, exclusion area boundary, company property, abutting and adjacent properties, nearby water bodies, and inhabited areas, plus other relevant details as may be appropriate.

###### 2.1.2 Demography

A description of the potentially affected local and/or regional population should be provided.



## 2.2 Meteorology

Data on site meteorology should be provided including: (1) diurnal and monthly averages and extremes of temperature and humidity; (2) monthly wind characteristics including speed and direction, annual joint frequency of wind speed, and direction of stability category; (3) data on precipitation; and (4) frequency of occurrence and effects of storms.

## 2.3 Hydrology

### 2.3.1 Surface Water

Describe the location, size, shape, and other hydrologic characteristics of streams, rivers, lakes, marshes, estuaries, etc. of the environs. Include a description of any upstream and downstream river control structures and downstream water supply users (including location, amount, and purpose, i.e., domestic, agricultural, etc.) and provide a map (topographic, if available) showing major hydrologic features of the area.

### 2.3.2 Groundwater

Describe the regional and local groundwater aquifers, formations, sources, and sinks. Describe the recharge potential of the immediate site area. Describe the present and projected regional use; indicate gradients and seasonal variations in groundwater levels beneath the site.

## 2.4 Geology

Describe the geological aspects of the site. The discussion should note the broad features and general characteristics of the site and environs including stratigraphy and structural geology.

## 3.0 FACILITY DESIGN AND CONSTRUCTION

### 3.1 Ore Treatment Process

Provide a quantitative flow diagram of the process showing material throughputs and the compositions of each major flow stream in the process. Include a diagram of the plant layout, indicating areas and points in the process where dusts, fumes, or gases are generated.

### 3.2 Major Equipment

Provide a description of and operating specifications for all major items of process equipment

### 3.3 Instrumentation

Provide a description of the safety instrumentation and control systems, including the minimum specifications and operating characteristics.

## 4.0 WASTE MANAGEMENT SYSTEM

### 4.1 Gaseous

Provide a description of the dust collection and ventilation equipment that is utilized during operations, including the type, specifications, and location of such equipment. Include an analysis of the efficiency of the equipment as designed and operated to prevent exposures to employees. Also, include a description of types and concentration of effluents discharged and methods for preventing releases of radioactive materials and for limiting such releases to as low as reasonably achievable. Include provisions for operating the equipment at its reasonably expected best performance during operations.

### 4.2 Liquids and Solids

Provide the following information on the waste retention system:

1. A description of the proposed system for preventing the discharge of liquid and solid wastes to the environment.
2. A detailed description of the methods proposed for disposal of the liquid and solid waste materials upon completion of the operation. Include the proposed methods for the disposal of liquid and/or solid product materials.

### 4.3 Contaminated Equipment

Describe the methods proposed for disposing of contaminated waste solids such as used filter bags or worn-out equipment generated during operation of the facility.

## 5.0 OPERATIONS

### 5.1 Corporate Organization

Provide a detailed description of the applicant's organization, including authority and responsibility of each level of management and/or supervision in regard to development, approval and adherence to operating procedures, maintenance activities, and changes in the plant circuit.

## 5.2 Qualifications

Provide a description of the qualifications and experience of the personnel in the applicant's organization assigned the responsibility for developing, conducting, and administering the radiation safety program.

## 5.3 Training

Provide a description of the radiation safety instructions provided employees, including a copy of the applicant's written radiological safety operation instructions. These instructions should include instructions for wearing personnel monitoring devices and respirators, instructions for cleaning up excessive quantities of dust, etc.

## 5.4 Security

Provide a description of the method for preventing unauthorized entry into the operating and waste storage areas.

## 5.5 Radiation Safety

Provide a description of the radiation safety program to be conducted including:

1. A description of the methods, instrumentation, and equipment for determining exposures of employees to external radiation. For personnel monitoring devices, indicate the number and category of personnel involved in the program and the supplier of the devices.
2. A description of the survey program which is followed to determine concentrations of airborne radioactivity within the facility including the make, model number, and capacity of sampling devices, and the procedures for sample analysis and instrument calibration. In the description of the routine and sampling program, include:
  - a. A description of each sampling location with respect to operating personnel;
  - b. A description of each sampling location with respect to the process operation; and
  - c. The frequency for sampling at each of the above locations.
3. A description of the procedure followed in determining the average daily and weekly exposures to airborne radioactivity for each employee who occupies areas where airborne radioactive materials exist.



4. A description of the survey program, methods, and procedures for determining the concentrations of airborne radioactive materials released to the environs, including a description of the environmental monitoring program to be conducted and the technical basis therefor. This should include the number, location, and frequency of check samples and the analyses to be performed.

#### 6.0 ENVIRONMENTAL REPORT APPENDIX

Information concerning the potential environmental impact of the ore processing facility should supplement that already provided in the application and should be adequate to permit USNRC to perform an independent environmental impact assessment of the proposed activity. The supplementary environmental information should be included as an appendix to the application and should present the basic, relevant information concerning those physical, biological, and human characteristics of the area environment that might be affected by the construction and operation of the facility on the designated site.

This information should be presented in the form of an assessment of the environmental impact of constructing and operating the activity. facility over the proposed period with particular emphasis on the following items:

1. Environmental effects of site preparation and facility construction.
2. Environmental effects of facility operation.
  - a. Radiological impact on man
  - b. Radiological impact on biota other than man
  - c. Effects of chemical discharges
  - d. Effects of sanitary and other waste discharges
3. Environmental effects of accidents.
4. Reclamation and restoration of the site.