

South Dakota Department of Environment and Natural Resources
Division of Environmental Services
Groundwater Quality Program
523 East Capitol Avenue - Joe Foss Building
Pierre, South Dakota 57501-3181

UIC Class III Permit Application
(November 2008)
ARSD 74:55:01

1. Name of person legally responsible for Class III operation (owner/operator),

Address: _____

Telephone: _____

Local representative or contact person if different from above:

Name: _____

Address: _____

Telephone: _____

2. Legal Location of Class III Facility:

County _____, _____ 1/4 _____ 1/4, Section _____,
Township _____, Range _____

3. Name of facility and/or project _____
Estimated Project life _____ years

Type of Class III operation:

New facility Modification of existing facility

Solution mining well Sulfur mining well by Frasch Process

Uranium mining well Other Class III wells: _____

(Please attach separate sheets as necessary to questions 4-14 below)

4. Physical description and analysis of the region and site - discussion must include (refer to ARSD 74:55:01:26):

- A. One or more contour (topographic) maps that accurately locate and identify the permit area along with the items listed below that are within the permit area and adjacent to the permit area:
 1. Public and private roads and highways
 2. Tribal reservation boundaries
 3. Buildings, dwellings (occupied and unoccupied), and other structures (Note: Occupied dwellings within a one-mile radius of the mine permit boundary must be identified)
 4. Utilities
 5. Easements
 6. Monitor wells, water wells, injection wells, producing wells, exploration wells, abandoned wells, oil and gas wells, exploration holes, (including depth, producing intervals, type of use, condition of casing, plugging procedures and date of completion for each well or drill hole)
 7. Proposed locations for *in situ* leach operations (processing facilities, chemical storage areas, production areas, well locations)
 8. All adjudicated and permitted surface and groundwater rights
 9. Current land use and zoning (within a one-mile radius of the mine permit boundary)

5. Geologic Description - discussion must include (*refer to 74:55:01:26(2)*):
 - A. Structural Geology - regional and local
 - B. Stratigraphy - description of geographic formations and thickness
 1. Geomorphology (topography)
 2. Land use
 3. Cross sections
 - C. Lithology of injection interval and confining units
 - D. Subsidence analysis of overlying aquifers, based on proposed *in situ* leach operation

6. Hydrogeologic Description - discussion must include (*refer to 74:55:01:26(3)*):
 - A. Description of the production zone including:
 1. Name of the aquifer
 2. Saturated thickness
 3. Flow direction
 4. Porosity
 5. Hydraulic conductivity
 6. Flow characteristics
 7. Hydraulic connection with other aquifers or surface sources
 8. Recharge information
 9. Water in storage
 10. Usage
 11. Projected areal extent of the aquifer

7. Well installation and maintenance - discussion must include (*refer to 74:55:01:26(7, 16, 17, 19)*):
 - A. A description of the essential well drilling features for injection, recovery, and monitor wells including:
 1. Total depth
 2. Screened interval
 3. Surface elevation
 4. Grouting
 5. Surface completion
 - B. A plan for the proper disposal of drill cuttings
 - C. Listing of existing and former wells in the production area that have and have not been appropriately plugged – including:
 1. Water wells
 2. Former producing wells
 3. Former injection wells
 4. Former monitor wells
 5. Abandoned wells
 6. Exploration holes
 - D. A plan for re-plugging existing and former wells that have not been appropriately plugged
 - E. A plan for well maintenance – including:
 1. Appropriate surface completions to protect against entrance of undesirable material into the well
 2. Marking the wells so that they can be clearly seen
 3. Keeping the area surrounding each well clear of brush or debris
 4. Maintenance and servicing of monitoring equipment located at the well so monitoring requirements can be met
 - F. A plugging plan for injection wells, recovery wells, monitor wells and exploration holes

8. Climate description - discussion must include (*refer to 74:55:01:26(5)*):
 - A. Monthly and annual averages of precipitation and temperature

9. Site monitoring plan - discussion must include (*refer to 74:55:01:26(10)*):
 - A. The groundwater quality of all water sources (production and non-production zones) in accordance with the parameters listed in ARSD 74:54:01:04, inclusive, if applicable
 - B. Sample collection procedures including:
 1. Collection methods
 2. Preservation procedures
 3. Quality control
 4. Minimum detection levels

5. Laboratory information:
 - a. Name
 - b. Address
 - c. Telephone number
 - d. Laboratory identification number
 - e. Signatures of the laboratory manager or technician performing the analysis

10. Description of the proposed method of operation - discussion must include (*refer to 74:55:01:26(11)*):
 - A. Description of the proposed mining injection solution
 - B. Chemical reactions that may occur during *in situ* operations
 - C. Injection rate (including average and maximum daily rate)
 - D. Volume of fluid to be injected
 - E. Proposed injection procedure
 - F. A map showing the wellfields and proposed sequence for injection
 - G. An estimated time schedule for injection into each wellfield
 - H. Expected changes in pressure
 - I. Expected native groundwater displacement
 - J. Direction of movement of mining solution

11. Groundwater protection and restoration - discussion must include (*refer to 74:55:01:26(12,14,15, & 17)*):
 - A. The procedures to ensure that the installation of recovery, injection, and monitor wells will not result in hydraulic communication between the production zone and overlying or underlying stratigraphic horizons
 - B. The procedures used to verify that the injection and production wells are in communication with monitor wells completed in the receiving strata and employed for the purpose of detecting excursions
 - C. A spill contingency plan to include reporting, response, assessment, and remedial actions
 - D. A description of measures employed to prevent an excursion, and in the event of an excursion, the plans to report or to verify the excursion, and plans for remedial action in accordance with ARSD 74:55:01:52 to 74:55:01:53.02, inclusive
 - E. Contingency plans to cope with all shut-ins and well failures so as to prevent the migration of mining solution into underground sources of drinking water
 - F. An assessment of impacts that may reasonably be expected as a result of the mining operation to water resources and water rights inside the permit area and on adjacent lands, and the steps that will be taken to mitigate these impacts
 - G. Methods and plans to restore groundwater quality – including:
 1. Proposed restoration table for all groundwater quality restoration

- values for each affected aquifer
 - 2. Estimated time schedule for achieving groundwater restoration for each affected aquifer, to be carried to completion within five years in accordance with applicable restoration tables
12. For uranium *in situ* leach mines, site-specific background radiological data - discussion must include (*refer to 74:55:01:26(13)*):
- A. Measurements of radioactive materials occurring in or that could be affected by the proposed operations:
 - 1. Important species
 - 2. Soil
 - 3. Air
 - 4. Surface water
 - 5. Groundwater
13. Aquifer exemption - discussion must include (*refer to 74:55:01:24*):
- A. Submit information necessary to demonstrate that the portion of the aquifer that will be used for injection meets the following criteria:
 - 1. It does not currently serve as a source of drinking water; and
 - 2. It cannot now and will not in the future serve as a source of drinking water because it is currently mineral producing, or can be demonstrated to contain minerals that, considering their quantity and location, are expected to be commercially producible
 - B. Submit information justifying the position of the aquifer exemption boundary:
 - 1. Hydrologic modeling results – discussion must include:
 - a. The need for the entire area in order to extract uranium to the fullest planned extent
 - b. Groundwater restoration
 - 2. Aquifer data and measurements
 - 3. Variability of flow rates in different directions within the aquifer
 - 4. An estimation of how long it would take an excursion to reach the aquifer exemption boundary
 - C. A map indicating:
 - 1. The aquifer exemption boundary
 - 2. Geologic cross section lines
 - 3. Monitor wells
 - 4. Permit boundary
 - 5. Outline of the ore body to be mined
 - D. Representative cross sections that include:
 - 1. Confining units above and below the mining zone
 - 2. Direction of lixiviant flow within the ore body
14. Estimated costs - discussion must include (*refer to 74:55:01:26(20)*):

A. Groundwater reclamation

1. Facilities, materials, and chemicals used for groundwater restoration
2. Groundwater restoration in the production zone
3. Water treatment
4. Capping, plugging, and sealing of all wells
5. Personnel working on reclamation-related activities
6. Collecting and analyzing samples from surface and groundwater monitoring sites

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment.

Signature

Date

Printed Name of Person Signing

Title

Subscribed and sworn before me this _____ day of _____, 20____.

Notary Public

My commission expires: _____

(SEAL)