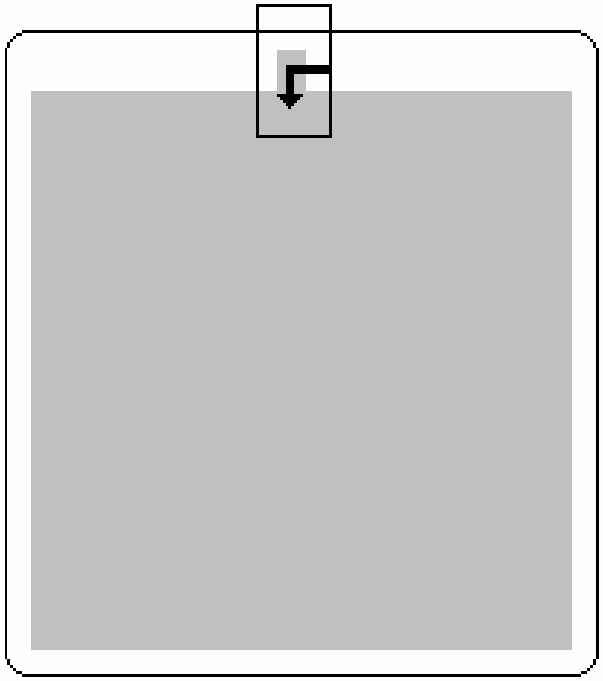
BUREAU OF WATER

South Carolina Department of Health and Environmental Control

Underground Injection Control Permitting

A guide to permitting injection into the subsurface



July/2002

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

www.scdhec.net/water

Preface

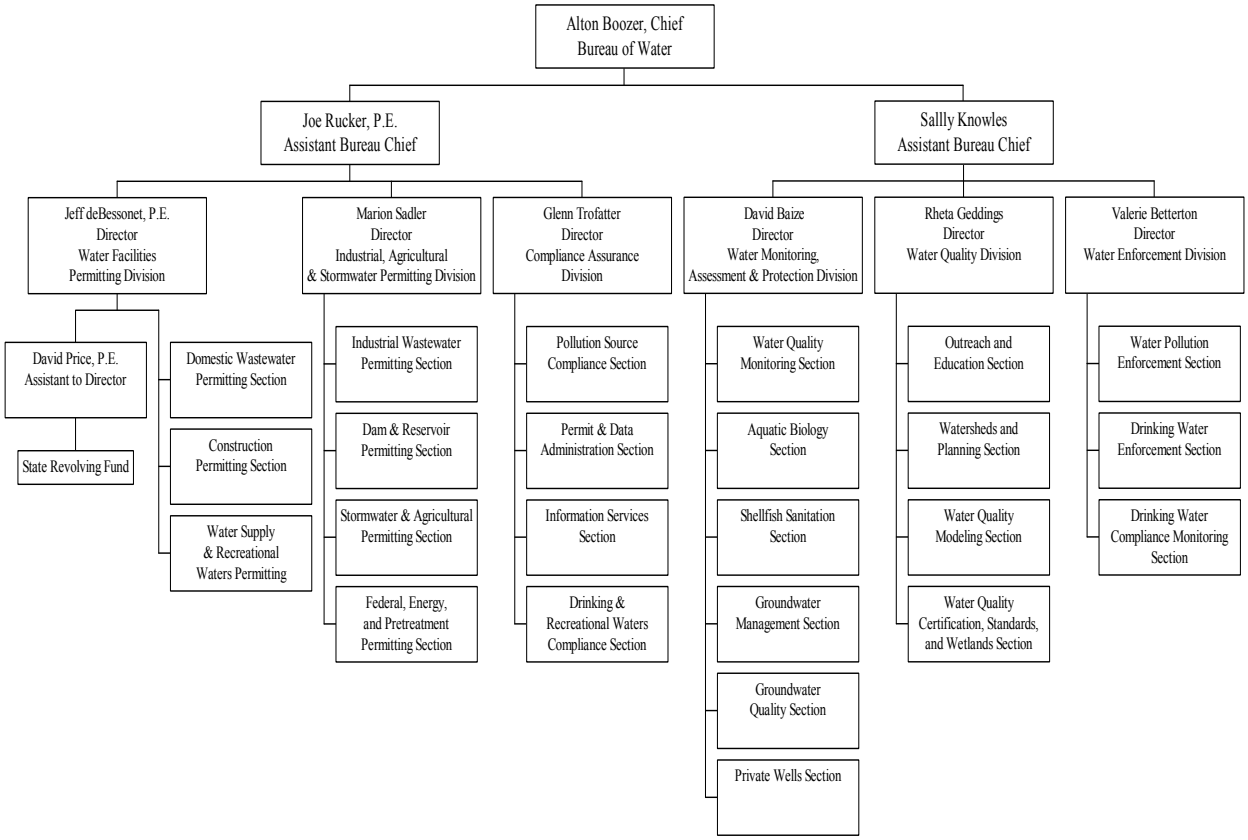
This document has been prepared for use by consulting engineers, developers, industries, and public entities dealing with the underground injection control program issues. It provides:

- ⇒ An overview of the Bureau's responsibilities
- ⇒ A summary of regulatory requirements
- ⇒ Identification of the entities involved in permitting, and
- ⇒ Highlights of the review and approval procedures.

We hope this document will help everyone have a better understanding of the underground injection control program. Through this understanding, we feel it will be easier to go through the administrative process, technical reviews, and approval processes of the Bureau.

This document provides an explanation of the Bureau's decision making processes. Our decisions are made based on the technical, administrative, and legal aspects of an underground injection control program with the protection of the environment and public health as the major considerations.

The Bureau is committed to providing quality service in a reasonable time in all aspects of the permit programs. To do this, we need the cooperation of all parties who deal with us in recognizing our responsibilities and the manner in which we implement them. Therefore, please take the time to read this document carefully. This document is not a replacement for the regulations on underground injection control programs. If you have any questions, please let us know. We welcome any comments you may have on this document or suggestions on how we can improve our service to you and the public.



Why?

Q ***Why is DHEC approval needed for injecting a fluid into the subsurface?***

A ***It is required by state law/regulations to help insure that proposed injections don't cause degradation to the groundwater quality.***

South Carolina's Underground Injection Control Regulation (R.61-87) provides the legal authority and mandate for DHEC to issue construction permits and operation permits for all Class VA Underground Injection systems. These regulations also require notification to DHEC of all Class VB (heat pump return systems) within one year of construction.

DHEC's Underground Injection Control permitting program helps to insure that all underground injection systems are designed and operated to ensure that the groundwater quality of the aquifer receiving the injectate is maintained and all other aquifers are protected.

A permit is required to inject any fluid into the subsurface through a well. This includes injection wells used for storm water drainage, aquifer recharge, salt-water intrusion barriers, experimental technology, natural gas storage, substance control, and corrective action (air sparging, reinjection of treated water, nutrient addition, etc.)

Where?

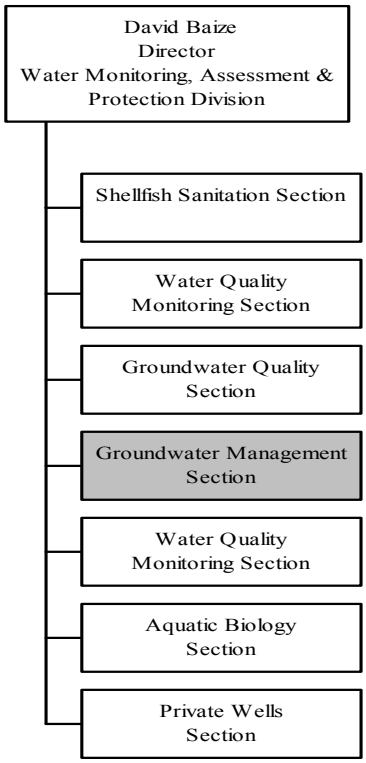
Q ***Where do I apply for a permit?***

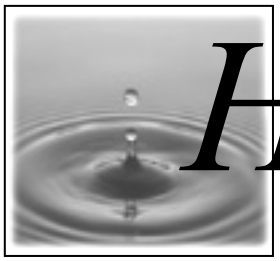
A ***DHEC's Bureau of Water is responsible for underground injection well permitting: 2600 Bull Street, Columbia, SC 29201.***

The Bureau of Water (Bureau) is under the Office of Environmental Quality Control (EQC) of DHEC. The Bureau is responsible for protecting the quality and quantity of the state's surface and groundwater and ensuring safe drinking water for the public. To meet this responsibility, the Bureau issues permits, approvals, and certifications for a variety of wastewater and drinking water projects. This booklet explains the permitting procedures of the Bureau for the Underground Injection Control Program.

WATER MONITORING, ASSESSMENT & PROTECTION DIVISION

The Water Monitoring, Assessment & Protection Division handles this permitting responsibility for the Bureau of Water. Applications should be directed to the *Groundwater Management Section* for review. Permit review status can be directed to either the project manager or the section manager.





How?

Q ***How do I apply for a permit?***

A ***An applicant should supply DHEC with a completed application for Underground Injection Control Permit and all attachments.***

The following processes highlight steps for obtaining DHEC permits to construct and operate.

PERMIT TO CONSTRUCT

Prior to construction of any injection well, a complete application for a permit to construct and all attachments must be submitted in triplicate to DHEC for review. A sample of the application form is attached in the appendix. Permit application forms are available at DHEC or from the DHEC Home Page on the Internet. There is no application fee. The following attachments should be submitted with an Underground Injection Control (UIC) permit application for injection wells:

Attachment A: Activity for Review

Submit a brief description of the activities to be conducted that require a UIC permit.

Attachment B: Well Construction Details

Submit schematic or other appropriate drawings of the surface and subsurface construction details of the recovery and injection wells.

Attachment C: Operating Data

Submit the following proposed operating data for each injection well:

1) Average and maximum daily rate and volume of fluid to be injected. In addition, indicate the average and maximum daily rate and volume of fluid to be withdrawn from each recovery well. Verification of the aquifer's hydraulic ability to produce and accept the quantities proposed should be presented.
2) Average and maximum injection pressures.
3) Pumping schedule (i.e., continuous, alternating cycles, etc.).

4) Proposed ranges in the concentration of all contaminant constituents within the in jection fluid. Include comprehensive groundwater quality data from a "worst case" well sample.
5) Length of time the project is expected to require injection to complete remediation (to ensure the effective dates of the permit will allow sufficient time to complete the project).

Attachment D: Monitoring Program

Discuss the planned monitoring program in detail:

1) Include a discussion of monitoring devices, sampling frequency (sufficient to verify treatment system efficiency), sampling protocol, sampling location, parameters to be analyzed, and proposed method(s) of analysis.
2) This plan should indicate how, through monitoring, the proposed contaminant levels in the injectate will be verified.
3) This plan should also clearly illustrate exactly how hydraulic control of the contaminant plume (and injectate, where relevant) will be verified through monitoring (i.e., piezometers, quality analysis, etc.).

Attachment E: Existing or Pending State/Federal Permits

List the program and permit number of any existing State or Federal permits for the facility (i.e., NPDES, RCRA, UST, etc.).

Attachment F: Description of Business

Give a brief description of the nature of the business of the facility and any immediately adjacent facilities.

Attachment G: Area of Review

1) The area of review should be a fixed radius of 1/4 mile from the injection well, the outermost injection wells if a wellfield.
2) If a fixed radius is not selected, the methods and the calculations used to determine the size of the area of review should be submitted.

Attachment H: Maps of Wells and Area of Review

1) Submit a topographic map of the area extending one mile beyond the project property boundaries. This map should show all hazardous waste treatment, storage, or disposal facilities, and all intake and discharge structures associated with the project facility. Any known areas of soil and/or groundwater contamination within a one-mile radius should be indicated. Also show all surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features such as residences, roads, and geologic faults (known or suspected).
2) A scaled map(s) should be included which shows the name and/or number and the location of all production, injection, monitoring, abandoned, and dry wells within the area of review. This should be accomplished by file and field surveys. Information regarding the construction (i.e., total depth, diameter, casing/screened intervals, grouting, etc.) and the current status (i.e., actively used, temporarily abandoned, permanently abandoned) of all wells within the area of review should be submitted. If

any wells have been abandoned, details on the method the wells were abandoned (i.e., cemented/grouted, filled with sand, etc.) should be included.

3) A potentiometric map of the project site should be submitted which accurately locates all monitoring wells and proposed recovery and injection wells and outlines the horizontal extent of both the free-phase contaminant (where applicable) and dissolved contaminant plumes. Include all water level and product thickness data. The date and time that water levels and product thickness were measured should be indicated.

Attachment I: Cross-Sections/Diagrams

1) Geologic cross-sections indicating the lithology and stratigraphy of the site and the horizontal and vertical extent of the contaminant plume, should be submitted. At least two stratigraphic cross-sections, one parallel and one perpendicular to the horizontal groundwater flow direction, should be submitted. In areas where the site stratigraphy is complex, additional cross-sections should be submitted to clearly illustrate the local conditions.

2) A schematic diagram, in the form of a cross-section, showing the proposed remediation system with the components of flow (above and below ground) and all associated appurtenances (i.e., stripping tower, piping, wells, etc.).

Attachment J: Name and Depth of Underground Sources of Drinking Water (USDW's)

Identify and describe all aquifers that may be affected by the injection.

Attachment K: Hydraulic Control

1) Sufficient supporting data (i.e., time/drawdown data, Theis curves and methods, calculations, etc.), used to determine aquifer characteristics to verify complete hydraulic control over the contaminant plume (and injectate, if proposed injectate quality does not conform to classified groundwater standards) during injection should be submitted. At a minimum, values should be given for transmissivity, hydraulic conductivity, effective porosity and specific yield.

2) Demonstrate the presence and magnitude of, or the absence of, any vertical hydraulic gradient at the site. If a vertical hydraulic gradient exists, show how its direction and magnitude are incorporated in the calculations demonstrating hydraulic control.

3) Groundwater flow computer models (especially 2-D map view with potentiometric and flow lines) may be utilized and submitted. All calculations should be in English units. All model-derived data and maps should be properly labeled and keyed so as to be clearly understood.

Once an application is received an initial administrative review is conducted. If the application is complete, a draft permit to construct and a statement of basis is prepared for non-major facilities and a draft permit to construct, a fact sheet and public notice is drafted for major facilities. If additional information is needed, the applicant will be contacted before the permit to construct is approved or denied.

The public notice for major facilities must be followed by a minimum 30-day comment period. If any objections to the application are received they will be addressed. Depending upon the number and substance of the objections, a public hearing may be held.

After the public comment period a permit to construct the well system will be issued or the request will be denied. This permit may be issued for up to ten years.

PERMIT TO OPERATE

After the injection well system is constructed, DHEC should be notified in writing of the well completion and sent a copy of the completed well record forms signed by a South Carolina certified well driller which illustrates the "as built" well construction. The facility must coordinate with DHEC to schedule a site inspection of the well system to ensure the system is in compliance with the approved application. If the injection well system is in full compliance, a permit to operate will be issued. The permit to operate is the final permission necessary prior to the startup of the injection system.

PERMIT MODIFICATION

Procedures for modifying a permit vary depending upon the extent of the modification. In some cases an application must be submitted. In other cases a letter requesting the modification will be sufficient. Modifications may require public notification. It is recommended that DHEC be contacted to determine the type (application or letter) of modification request needed a minimum of 60 days prior to the modification taking place.

PERMIT TRANSFER

Permits can be transferred to a new owner for the same type of use. To request a permit be transferred, the new owner should submit a letter requesting the transferal. The letter should include the name of the current permit holder and the new owner information to include the owner's full name, a contact person (if different from owner), mailing address, telephone number, fax number.

PERMIT RENEWAL

A permit can be issued for a maximum of ten years. On the expiration date of a permit, the permit will become invalid unless a complete application for renewal is made prior to the expiration date.