

Dated: May 7, 1984.

Federal Deposit Insurance Corporation.

Hoyle L. Robinson,  
Executive Secretary.

[FR Doc. 84-12833 Filed 5-9-84; 12:27 pm]

BILLING CODE 6714-01-M

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#### FEDERAL DEPOSIT INSURANCE CORPORATION

##### Change in Subject Matter of Agency Meeting

Pursuant to the provisions of subsection (e)(2) of the "Government in the Sunshine Act" (5 U.S.C. 552b(e)(2)), notice is hereby given that at its closed meeting held at 2:30 p.m. on Monday, May 7, 1984, the Corporation's Board of Directors determined, on motion of Chairman William M. Isaac, seconded by Director C. T. Conover (Comptroller of the Currency), concurred in by Director Irvine H. Sprague (Appointive), that Corporation business required the addition to the agenda for consideration at the meeting, on less than seven days' notice to the public, of a recommendation regarding an insured bank pursuant to section 4 of the Federal Deposit Insurance Act and section 5 of the Home Owners' Loan Act of 1933 (name and location of bank authorized to be exempt from disclosure pursuant to the provisions of subsections (c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii) of the "Government in the Sunshine Act" (5 U.S.C. 552b (c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii))).

The Board further determined, by the same majority vote, that no earlier notice of this change in the subject matter of the meeting was practicable; that the public interest did not require consideration of the matter in a meeting open to public observation; and that the matter could be considered in a closed meeting by authority of subsections (c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii) of the "Government in the Sunshine Act" (5 U.S.C. 552b(c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii))).

Dated: May 7, 1984.

Federal Deposit Insurance Corporation.

Hoyle L. Robinson,  
Executive Secretary.

[FR Doc. 84-12834 Filed 5-9-84; 12:27 pm]

BILLING CODE 6714-01-M

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#### FEDERAL DEPOSIT INSURANCE CORPORATION

##### Changes in Subject Matter of Agency Meeting

Pursuant to the provisions of subsection (e)(2) of the "Government in

the Sunshine Act" (5 U.S.C. 552b(e)(2)), notice is hereby given that at its open meeting held at 2:00 p.m. on Monday, May 7, 1984, the Corporation's Board of Directors determined, on motion of Chairman William M. Isaac, seconded by Director Irvine H. Sprague (Appointive), concurred in by Director C. T. Conover (Comptroller of the Currency), that Corporation business required the addition to the agenda for consideration at the meeting, on less than seven days' notice to the public, of a memorandum regarding the approval of funds for buildout of the Chicago Area and Regional Offices.

The Board further determined, by the same majority vote, that Corporation business required the withdrawal from the agenda for consideration at the meeting, on less than seven days' notice to the public, of a memorandum and resolution regarding proposed amendments to the Corporation's rules and regulations in the form of new Part 325, to be entitled "Capital Maintenance", which would (1) define capital for insured banks and, on a consolidated basis, for holding companies with insured bank subsidiaries; (2) establish minimum standards for adequate capital for all insured banks and, on a consolidated basis, for all holding companies that have insured bank subsidiaries; and (3) establish standards to determine when an insured bank is operating in an unsafe or unsound condition by reason of the amount of its capital.

By the same majority vote, the Board further determined that no earlier notice of these changes in the subject matter of the meeting was practicable.

Dated: May 7, 1984.

Federal Deposit Insurance Corporation.

Hoyle L. Robinson,  
Executive Secretary.

[FR Doc. 84-12835 Filed 5-9-84; 12:27 pm]

BILLING CODE 6714-01-M

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#### FEDERAL DEPOSIT INSURANCE CORPORATION

##### Agency Meeting

Pursuant to the provisions of the "Government in the Sunshine Act" (5 U.S.C. 552b), notice is hereby given that at 10:00 a.m. on Tuesday, May 8, 1984, the Board of Directors of the Federal Deposit Insurance Corporation met in closed session to consider a recommendation regarding an insured bank pursuant to section 4 of the Federal Deposit Insurance Act and section 5 of the Home Owners' Loan Act of 1933 (name and location of bank authorized to be exempt from disclosure

pursuant to the provisions of subsections (c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii) of the "Government in the Sunshine Act" (5 U.S.C. 552b (c)(4), (c)(6), and (c)(8), and (c)(9)(A)(ii))).

In calling the meeting, the Board determined, on motion of Chairman William M. Isaac, seconded by Director Irvine H. Sprague (Appointive), that Corporation business required its consideration of the matter on less than seven days' notice to the public; that no earlier notice of the meeting was practicable; that the public interest did not require consideration of the matter in a meeting open to public observation; and that the matter could be considered in a closed meeting pursuant to subsections (c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii) of the "Government in the Sunshine Act" (5 U.S.C. 552b (c)(4), (c)(6), (c)(8), and (c)(9)(A)(ii))).

The meeting was held in the Chairman's Office, Room 6023 of the FDIC Building located at 550 17th Street, NW., Washington, D.C.

Dated: May 8, 1984.

Federal Deposit Insurance Corporation.

Hoyle L. Robinson,  
Executive Secretary.

[FR Doc. 84-12836 Filed 5-9-84; 12:27 pm]

BILLING CODE 6714-01-M

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#### FEDERAL ENERGY REGULATORY COMMISSION

"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT: 49 FR 19433, May 7, 1984.

PREVIOUSLY ANNOUNCED TIME AND DATE OF MEETING: May 9, 1984, 10:00 a.m.

CHANGE IN THE MEETING: The following item has been added to the agenda:

Item No., Docket No. and Company

CI-1; CI83-163-001, Texaco Inc.

Kenneth F. Plumb,  
Secretary.

[FR Doc. 84-12815 Filed 5-9-84; 9:53 am]

BILLING CODE 6717-02-M

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#### FEDERAL MARITIME COMMISSION

TIME AND DATE: 9:00 a.m.—May 16, 1984.

PLACE: Hearing Room One—1100 L Street NW., Washington, D.C. 20573.

STATUS: Parts of the meeting will be open to the public. The rest of the meeting will be closed to the public.

MATTERS TO BE CONSIDERED: Portion open to the public:

1. Special Docket No. 1102: Application of United States Atlantic & Gulf-Jamaica and



Hispaniola Steamship Freight Association and Sea-Land Service, Inc. for the benefit of United Brands for Chiquita International Trading Co.—Consideration of the record.

**Portion Closed to the public:**

1. Docket No. 82-3: South Atlantic—North Europe Rate Agreement (Agreement No. 9984-23) and Gulf-European Freight Association (Agreement No. 10270-2)—Consideration of the record.

**CONTACT PERSON FOR MORE**

**INFORMATION:** Francis C. Hurney, Secretary (202) 523-5725.

Francis C. Hurney,  
Secretary.

[FR Doc. 12811 Filed 5-9-84; 9:15 am]

BILLING CODE 6730-01-M

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[USITC SE-84-21A]

**INTERNATIONAL TRADE COMMISSION**

**"FEDERAL REGISTER" CITATION OF PREVIOUS ANNOUNCEMENT:** 49 FR 18944 (May 3, 1984).

**PREVIOUSLY ANNOUNCED TIME AND DATE OF THE MEETING:** 10:00 a.m., Monday, May 14, 1984.

**CHANGES IN THE MEETING:** Deletion of item No. 5 on the agenda as follows:

In conformity with 19 CFR 201.37(b), Commissioners Eckes, Stern, Haggart, Lodwick, and Rohr determined by recorded vote (Action Jacket GC-84-065) that Commission business requires the change in subject matter by deletion of item No. 5 [Investigation 751-TA-8 (Acrylic Sheet from Japan)—briefing and vote], affirmed that no earlier announcement of the deletion was possible, and directed the issuance of this notice at the earliest practicable time. (Commissioner Liebler did not participate in the vote.)

**CONTACT PERSON FOR MORE**

**INFORMATION:** Kenneth R. Mason, Secretary. (202) 523-0161.

[FR Doc. 84-12902 Filed 5-9-84; 3:56 pm]

BILLING CODE 7020-02-M

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**PAROLE COMMISSION**

Public Announcement

**AGENCY HOLDING MEETING:** U.S. Parole Commission, National Commissioners. The Commissioners presently maintaining offices at 5550 Friendship Boulevard, Chevy Chase, Maryland, Headquarters.

**PREVIOUSLY ANNOUNCED TIME AND DATE:** Tuesday, May 8, 1984—2:00 p.m.

**CHANGES IN MEETING:** The new date and time is Wednesday, May 9, 1984, at 2:00 p.m. Notice of this change is being made at the earliest practicable time.

**PLACE:** Room 420-F, One North Park Building, 5550 Friendship Boulevard, Chevy Chase, Maryland 20815.

**STATUS:** Closed pursuant to a vote to be taken at the beginning of the meeting.

**MATTERS TO BE CONSIDERED:** Referrals from Regional Commissioners of approximately 4 cases in which inmates of Federal prisons have applied for parole or are contesting revocation of parole or mandatory release.

**CONTACT PERSON FOR MORE**

**INFORMATION:** Linda Wines Marble, Chief Case Analyst, National Appeals Board, United States Parole Commission, (301) 492-5987.

Dated: May 8, 1984.

Joseph A. Barry,  
General Counsel, United States Parole Commission.

[FR Doc. 84-12829 Filed 5-9-84; 11:30 am]

BILLING CODE 4410-01-M



# Register Federal

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Friday  
May 11, 1984

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## Part II

### Environmental Protection Agency

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40 CFR Parts 124, 144, 146, and 147  
Underground Injection Control Program;  
Federally-Administered Programs; Final  
Rule



# ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 124, 144, 146, and 147

[WH-FRL 2532-4]

## Underground Injection Control Program; Federally-Administered Programs

**AGENCY:** Environmental Protection Agency.

**ACTION:** Final rule.

**SUMMARY:** The Safe Drinking Water Act (SDWA) requires the Environmental Protection Agency (EPA) to prescribe an Underground Injection Control (UIC) Program for States which were listed pursuant to section 1422(a) of the Act if a State has not submitted an application or if the State program has been either disapproved or no longer meets the requirements of the Act.

The UIC Programs, whether implemented by the States or EPA, are designed to prevent underground injections through wells which may endanger drinking water sources. In some cases, the EPA will implement a program covering all classes of wells for a State; in others where a State program covers only some classes of wells, the Federal program will cover only the remaining classes.

In this rulemaking, the Agency is promulgating regulations establishing UIC Programs in each of 22 jurisdictions, listed in Table 1, for which no State-implemented program has been approved. (See "SUPPLEMENTARY INFORMATION".)

Today's promulgation consists of two parts: (1) Amendments to Part 144, EPA's minimum requirements for UIC programs that will apply to EPA-administered programs; and (2) Part 147, which for each EPA-administered State program references and makes applicable Parts 124, 144 and 146, and prescribes certain State-specific requirements. Part 147 also describes EPA's approval of State-administered UIC programs and incorporates by reference appropriate provisions of State statutes and regulations. Finally, the EPA is prescribing in Part 147 programs for certain Indian lands, listed in Table 1 below.

The ban on Class IV injection wells being promulgated today in § 144.13 applies to the minimum requirements, and therefore, affects both EPA-administered programs and programs administered by States having primary enforcement responsibility. Most State-administered programs ban injection through Class IV wells; however, States which do not, have 270 days from the

effective date of these regulations to amend their program as specified in section 1422(b)(1)(B) of the SDWA.

**DATES:** These regulations shall be promulgated for purposes of judicial review at 1:00 p.m. eastern time on May 25, 1984. These regulations shall become effective on June 25, 1984. In order to assist the EPA to correct typographical errors, incorrect cross-references, and similar technical errors, comments of a technical non-substantive nature on the final regulations may be submitted until June 11, 1984. The effective date will not be delayed by consideration of such comments.

**ADDRESSES:** Comments of a technical and non-substantive nature should be addressed to Judy Long, Comment Clerk, Ground Water Protection Branch, EPA, Office of Drinking Water (WH-550), 401 M Street S.W., Washington, D.C. 20460.

**FOR FURTHER INFORMATION CONTACT:** John B. Atcheson, Ground Water Protection Branch, EPA (202) 382-5530.

### SUPPLEMENTARY INFORMATION:

#### TABLE 1—JURISDICTIONS FOR WHICH THE PROGRAMS ARE PROMULGATED

(The proposed program covers all Classes of wells unless otherwise noted.)

#### THE UIC PROGRAM

Alaska (including Indian lands)  
 Arizona (including Indian lands except Navajos)  
 California (Class I, III, IV and V wells on all lands, including Indian lands; Class II wells on Indian lands only)  
 Colorado (Classes I, III, IV and V wells on all lands, including Indian lands; Class II wells on Indian lands only except the Ute Mountain Reservation)  
 District of Columbia  
 Idaho (including Indian lands)  
 Indiana  
 Iowa (including Indian lands)  
 Kentucky  
 Michigan (including Indian lands)  
 Minnesota (including Indian lands)  
 Missouri (Class I, III, IV and V wells only)  
 Montana (including Indian lands)  
 Nebraska (Class I, III, IV and V wells on all lands, including Indian lands; Class II wells on Indian lands only)  
 Nevada (including Indian lands)  
 New York (all Indian lands but Seneca)  
 Pennsylvania  
 Tennessee  
 Virginia  
 American Samoa  
 Northern Mariana Islands  
 Trust Territories

## I. Background

These regulations are being promulgated under the authority of Part C of the Safe Drinking Water Act (SDWA) (42 U.S.C. 300f to 300j-9) and, to the extent that they deal with hazardous waste, the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 *et seq.*). The SDWA is designed to protect the quality of drinking water in the United States and Part C of the SDWA specifically mandates regulation of underground injection of fluids through wells. The regulations being promulgated today were proposed on September 2, 1983 (48 FR 40098 *et seq.*). Public hearings were held in one or more locations in all the States where these rules were proposed. The EPA has received comments from States and local governments, industry, environmental groups, private citizens and trade associations. After weighing the comments carefully EPA is promulgating these requirements with changes from the proposal as appropriate. A detailed discussion of the relevant statutory provisions and regulatory development appeared in the proposal to these regulations (see 48 FR 40099 *et seq.*, September 2, 1983).

## II. Structure of Direct Implementation

### A. Contents of the Federally-Administered programs

For the reasons outlined in the preamble to the proposed regulations (48 FR 40100) the Agency has adopted the following scheme to promulgate Federally-prescribed State programs:

(1) Requirements necessary to supplement or clarify all the EPA-administered programs are promulgated as amendments to Part 144.

(2) New Part 147 contains a subpart for each State program. In the case where EPA administers the program this part:

(a) Incorporates by reference and makes applicable the UIC minimum requirements of 40 CFR Parts 124, 144 and 146; and

(b) Prescribes additional State-specific requirements.

For State-administered programs, this part incorporates by reference and makes applicable requirements from the appropriate State statutes and regulations. Such requirements are made a part of the UIC program under the SDWA.

### B. Jurisdictions Covered

(1) *States:* With a few exceptions explained below, these final rules apply to all the States for which they were



proposed in September 1983. The exceptions are:

**Arkansas and Colorado:** Since the September 2, 1983, proposal of EPA-administered programs for Class II wells in Arkansas, and all classes of wells in Colorado, these States have submitted final applications for primary enforcement authority for programs to regulate Class II wells. After careful review, EPA determined that the States' applications were adequate, and approved these State-administered programs.

This approval eliminates the need to promulgate an EPA-administered program for Class II wells in Arkansas. For this reason, the EPA withdrew the notice of hearing and is not at this time promulgating a Federal program for Arkansas.

In the case of Colorado, the Agency had proposed a program for all classes of wells. The approval of the Class II program pursuant to Section 1425 of the SDWA eliminates the need to implement a program for wells except for on Indian lands, where the State does not assert jurisdiction. In the case of the Ute Mountain Reservation, EPA intends to promulgate a program at a later date. The program promulgated for Colorado today therefore, covers all classes of wells on Indian lands (except the Ute Mountain Reservation), and only Class I, III, IV, and V wells in the rest of the State.

**Indian lands:** Minnesota and Wisconsin—A ban on injection wells on tribal lands in these States is being developed and will be proposed. EPA is taking this course action in response to comments received from a majority of tribes.

### III. Response to Comments: General Program Elements

#### A. Comments Not Appropriate to This Rulemaking

Many comments were received on regulatory requirements that were not proposed on September 2, but which already existed by virtue of earlier rulemaking. Some of these comments are discussed in detail below. Others included the requirement for monitoring wells associated with Class I injection wells, the requirement that a plugging and abandonment plan be prepared for all wells, and the requirement that owners or operators of existing Class II fields authorized by rule obtain permits for any new wells to be added to the field. In addition, EPA received comments on the classification of injection wells, comments on the methods for analyzing fluids, suggestions that certain classes be

exempted from regulation, or that they be regulated in a different manner, and suggestions that the time limits for inventory and other reporting specified in the minimum requirements be changed. Commenters also suggested that EPA regulate abandoned wells and producing wells under the UIC program. Finally, several commenters suggested that EPA was not the appropriate regulatory body to administer the UIC program. Most of these comments were made without explanation as to why the commenter believed they were appropriate for established, promulgated regulations. A few commenters presented the position that all requirements existing in the current regulations as minimum requirements for State programs should be reviewable on the basis that the application of these requirements to actual EPA-administered State programs is a new proposal.

The Agency believes that this contention is without foundation. Much of what was published in the proposal was merely recodification of the minimum requirements. In addition, EPA made very clear in both the proposal and promulgation of the minimum requirements regulations that these were to serve as minimum requirements for all State UIC programs, whether administered by the States or by EPA. While EPA may go beyond these minimum requirements in the programs the Agency administers, as a matter of existing regulatory law the programs must at least meet the minimum requirements already established in 40 CFR Parts 124, 144 and 146. In addition, the substance of these regulations was open to judicial review after their initial promulgation, and indeed the regulations were the subject of a major appellate court challenge and subsequent court-approved settlement. Consequently, EPA does not believe that the existing requirements of Parts 124, 144 and 146 are appropriate for comment. EPA has, however, recorded the comments, and will consider them to the extent that the Agency wishes to contemplate amendments to the existing regulatory program, although the Agency is under no formal obligation to do so.

#### B. Adoption of Requirements for EPA-administered Programs as Minimum Requirement for All Programs

A few commenters, while generally supporting the proposed requirements for EPA-administered programs, expressed the opinion that they should be adopted as minimum requirements for all programs, and thus apply to State-administered programs as well.

Specific requirements mentioned were the requirements for submission of post-plugging reports (§ 144.28(k)), the one year time limit for submission of evidence of financial responsibility for wells authorized by rule (§ 144.28(d)(2)), notice to surrounding landowners of submission of a permit application (§ 144.31(e)(9)), and the requirement of notice to the Director before discarding records at the end of the three year retention period (§§ 144.28(i) and 144.51(j)(2)(i)).

The Agency does not believe that it is appropriate at this time to adopt these as requirements that would apply to State-administered programs. The SDWA dictates that Federal regulations not interfere unnecessarily with existing State programs, and a consequence of this mandate is the need to allow States to meet standards of performance in a variety of ways. Although EPA believes that the requirements being promulgated today are appropriate for in a variety of ways. Although EPA believes that the EPA-administered programs, for the most part they reflect the details of how existing general standards or requirements should be carried out. These may be incompatible with a given State's unique scheme for accomplishing the same standard. EPA has no evidence at this time that these State schemes are inadequate. If further information indicates that this may be so, EPA would consider adopting some of these as minimum standards if this could be done in a manner compatible with the various existing and adequate State schemes.

#### C. Coordination With States

The Agency received several comments, including some from States themselves, regarding the relationship of EPA-administered UIC programs to existing State laws and programs relating to underground injection.

Some commenters maintained that existing State requirements are adequate to protect drinking water, and that EPA should not impose Federal requirements where State programs exist. In response, where States have authorities and requirements equivalent to Federal requirements they can apply to EPA for primary enforcement authority of the UIC program and will be granted such authority if EPA determines that the State program meets Federal requirements. EPA has worked diligently for several years to encourage States to identify or obtain such authorities and requirements and apply for program approval. For the programs in the 22 States covered by this rulemaking, however, the States have



failed to submit applications or have submitted applications that fail to meet Federal requirements. In these cases, the SDWA unequivocally requires EPA to promulgate Federally-administered programs. The Agency could not decline to regulate in deference to these existing State programs without violating Federal law.

Other commenters suggested that in promulgating EPA-administered programs the Agency should adopt requirements patterned after existing State regulations rather than use the existing minimum UIC requirements regulations. First, because of regulatory statements that these minimum requirements apply to EPA as well as States, EPA could not adopt any such State requirements that were less stringent than the minimum Federal requirements. As to the possibility of adopting requirements or procedures that may be equivalent but different, EPA believes that it is important to maintain a consistent national program in EPA-administered jurisdictions for efficiency and consistency in administration. EPA may consider departures from this principle in the case of Indian land programs, where there are special considerations of Indian preferences and, in many cases, of consistency with equivalent but varying approved State-administered programs in the rest of the State. EPA does not believe that such departures from the principle of national uniformity are appropriate in the case of entire State programs, however, especially considering that States are able and encouraged to assume primary enforcement authority as an alternative to the direct Federal presence.

Other commenters suggested that EPA confer with States in all significant program decisions such as issuance of permits, or aquifer exemptions. EPA agrees that coordination and cooperation with the State government in a Federally-administered State is important. Existing procedural mechanisms should be sufficient to provide for this. By regulation EPA must provide individual notice of permitting procedures (the preparation of a draft permit) to all persons on a mailing list that anyone may join upon request. If the State will inform EPA of the appropriate State agency or office to receive notice, EPA can enter this on the list. In addition to notice of the preparation of draft permits, EPA intends to notify individually all persons listed of proposals for other significant programs actions such as aquifer exemptions. Since notice of these actions can thus be assured, the State

will have the opportunity to provide comment on the proposed actions, which will be considered carefully by EPA before any final determinations are made.

Finally, some commenters, concerned with the prospect of being subjected to different requirements by both the State and EPA, suggested that EPA explicitly preempt State requirements in the area of underground injection control. Section 1423(c) explicitly preserves the authority of any State or political subdivision to adopt or enforce any requirements respecting underground injection, provided only that no such requirements relieve any person from complying with any Federal requirement otherwise applicable.

Other commenters suggested that EPA consider existing State requirements when setting specific requirements, particularly those for maximum injection pressure and financial responsibility. The Agency has done so, and will continue to work with States to the maximum extent possible, within the bounds imposed by the minimum requirements.

#### *D. Indian Lands*

*Within EPA-administered States.* In the September 2, 1983 proposal, EPA stated its intention to apply EPA-administered State programs to all Indian lands in those States. Except where the Agency has received significant comment to the contrary from interested Indians, EPA is following through on that proposal in today's rulemaking. The Agency may in certain cases, however, consider subsequent amendments that would apply only to Indian lands in such States if necessary to accommodate a strong tribal preference or other justifications. For example, where there are no wells of a given class, and existing tribal regulation or policy prohibits such practices, EPA may accommodate tribal preference by promulgating a ban of such well classes. Comments to this effect were received during the comment period for the September 2, 1983 proposal, and EPA will propose additional requirements accordingly as necessary.

*Within States with approved State-administered Programs.* The Agency also presented four alternative approaches to promulgating UIC programs on Indian lands in States with approved State-administered programs: (1) Implement a program consisting of current UIC minimum requirements; (2) implement a program consisting of requirements patterned after State requirements from the approved program applicable in the rest of the

State; (3) adapt a combination of the minimum UIC requirements regulations and the approved State program requirements; or (4) develop unique requirements in response to Indian concerns or other special circumstances. The great majority of commenters, both Indian and non-Indian, preferred the second approach where requirements are patterned after those of the approved State program. A few commenting Tribes, however, expressed additional tribal preferences. Consequently, depending on Indian wishes, EPA may use any of the four proposed options appropriate to the individual case when implementing programs for Indian lands in primacy States. As within EPA-administered States, EPA will consider subsequent amendments that would apply to Indian lands if a Tribe should, at a later date, develop preferences or other justification for such an amendment.

Any State-administered program approved by EPA necessarily meets EPA minimum requirements. However, in promulgating a Federal Indian lands program mirroring a State program, EPA must be sure that the State does not use authorities unavailable to EPA. For example, several States rely on administrative orders or the ability to impose pipeline severance. While these are effective tools, the Safe Drinking Water Act does not provide EPA with the authority to use them. Consequently, to ensure that the Indian lands program to be adopted includes only those elements appropriate to Federal authorities, EPA must conduct a thorough and potentially time-consuming review of the approved State-administered program. With a few exceptions EPA has not had the time to assemble such programs in time for today's promulgation, but will promulgate such programs as soon as possible thereafter. Where the program will reflect exclusively the requirements of State programs already approved, EPA believes that notice of this approach and the announced availability of approved State program requirements for review are sufficient to satisfy the requirement for notice and public comment, and may promulgate such programs without separate proposal. In all cases, however, affected Tribal Governments will be kept fully informed and, as feasible, be closely involved in the decision process regarding the choice of option and program implementation for their reservations. Where the Indian programs will contain new, unique requirements, these will be proposed for comment before promulgation.



#### E. Class IV Ban

In general, commenters were supportive of the Agency's proposal to ban all Class IV injection activities. A few commenters requested clarification on the definition of a Class IV well, and a few others suggested that injections into exempted aquifers be classified as a Class I well. The discussion below describes the regulations being promulgated today with respect to Class IV wells, and clarifies the effect of aquifer exemptions on the regulatory status of hazardous waste wells.

Class IV wells include the following three types of injection practices:

- (1) Wells used to inject hazardous or radioactive waste *above* a USDW;
- (2) Wells used to inject hazardous or radioactive waste *into* a USDW; and
- (3) Wells used to inject hazardous waste which do not fall into the first two categories and are not Class I wells; for example, where the aquifer into which injection is occurring has been exempted but it is not the lowermost USDW, the well would be a Class IV well.

Existing regulations in 40 CFR 144.13 prohibit all Class IV wells injecting into USDWs, effective six months after approval or promulgation of a UIC program in the State. EPA is now amending § 144.13 to clarify the classification of certain hazardous waste wells and to prohibit all Class IV wells with one very limited exception.

The Agency believes the prohibition of Class IV wells to be overwhelmingly justified. Existing regulations already provide for prohibition of injections directly into USDWs, for obvious reasons. The Agency believes that equal justification exists for prohibiting injections above USDWs for several reasons. First, this type of injection is extremely unlikely to occur since the definition of a USDW includes the entire formation in which the saturated zone is located, and since surface formations invariably contain ground water, injection above the water table would be "into" the formation containing the USDW and would consequently be banned. Second, even in cases of injections "above" USDWs, the fact that there is no confining layer between the injected waste and the ground water means that the injected fluids could in most cases easily migrate down to the water table, an obvious threat to drinking water.

In addition, the prohibition does not appear as though it will disrupt an established practice, since current inventories indicate that very few of these wells exist nationwide. Finally, and very significantly, public comment

has overwhelmingly supported prohibition of these practices.

The exception to the Class IV prohibition is very limited, and does not conflict with the reasons for the prohibition or the concerns expressed in the public comments. It applies to injections associated with Federal activities designed to clean up an aquifer that has been contaminated by a hazardous waste site or similar source of contamination. Such cleanup typically consists of pumping, treating, and reinjecting the contaminated ground water, going through this cycle as long as necessary to clean up the contaminated aquifer. The water that is reinjected, although treated, may nonetheless contain traces of contaminants sufficient to render the reinjected water a "hazardous waste" by Federal definition, thus making these injection facilities Class IV wells. Given that the purpose and effect of this practice is to *improve* the quality of water in the aquifer, EPA believes that the environment and the health of persons is better served by allowing such activities to take place.

To qualify for this exception from the Class IV prohibition, the activity must be approved by EPA pursuant to the cleanup program under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or as part of a cleanup activity performed pursuant to the Resource Conservation and Recovery Act (RCRA). Aquifer cleanup actions by private parties can qualify for this exception, but only if their actions have been formally approved by EPA.

Another clarification has been included in the regulations with respect to wells that inject where no USDW exists within  $\frac{1}{4}$  mile of the well bore in any underground formation. Very few situations of this type exist; the only ones known to EPA are a few locations along the Gulf Coast where, because of the proximity to sea water, all underground water contains total dissolved solids in excess of 10,000 mg/l. Because this situation is so unusual, it does not fit neatly into the existing classification system. Depending on the interpretation, a well in such an area could be considered a Class I well. Class I wells by definition inject below the lowermost formation containing a USDW, and where no USDWs exist in any underground formation, any injection could be said to meet this criterion. If this interpretation were not taken, such wells would be classified as the third type of Class IV well, by virtue of § 144.6(d)(3), which includes any hazardous waste well that cannot be

classified under the definition of Class I or the other types of Class IV.

Since no USDWs are in the area of this type of well, the potential danger presented by such wells is distinctly less than presented by those wells that EPA has explicitly defined as Class IV. For this reason, an interpretation that would classify these wells as Class IV does not appear to be warranted. In addition, as long as any wells in these areas inject into a formation that is sufficiently confined to prevent the escape of injected fluids from the injection zone to other formations or to the surface aquifer or the marine environment, the well would be identical in nature to other Class I wells. The Agency, therefore, interprets wells of this type to be Class I wells, and has clarified this in the regulations at § 144.13(d). In this clarification, EPA has made it clear that in order to be authorized, such a well would have to inject into a confined formation. As just described, such a prerequisite is necessary in order to ensure that these wells are consistent in nature with the other types of Class I wells. Given this interpretation, such wells would be required to obtain permits as do all Class I wells, and to comply with all applicable requirements. The Agency would like to stress that this type of well is exceedingly rare, and that the Agency does not, therefore, expect that many, if any, wells of this type will need to be addressed.

To further clarify the regulatory treatment of wells injecting hazardous or radioactive waste, it is helpful to examine the effect of aquifer exemptions on these wells. EPA's aquifer exemption mechanism was promulgated because of the Agency's decision to adopt a very broad definition of USDWs. This broad definition ensures that any aquifer even potentially usable as drinking water will be considered a USDW, but also results in classifying as USDWs some aquifers that are contaminated, inaccessible, or otherwise unsuitable or unlikely to be used as drinking water. EPA believes that the most protective course was to adopt this broad definition, and allow exemptions from classification as USDWs on a case by case basis after EPA review and the opportunity for public comment. In 40 CFR 144.7, existing regulations set forth various criteria for exemption of aquifers relating to the quality or accessibility of the ground water contained and the potential for use as drinking water. If an aquifer is not currently being used for drinking water, and meets one of the specified criteria, EPA may exempt the aquifer. The use of the word "may"



reserves to the Agency the discretion to decline to exempt an aquifer, even if it meets one of the criteria, if the Agency believes that other considerations warrant maintaining the USDW classification. The Agency has approved no aquifer exemptions to date for purposes of hazardous waste injection.

If EPA were to exempt an aquifer (and that exemption applied to hazardous waste injections), injection of hazardous waste into the aquifer would be either a Class I or a Class IV well (see § 144.6). If the exempted aquifer were the lowermost formation meeting the definition of USDW, the injection would occur beneath the lowermost USDW and the facility would then be a Class I well, and would be permissible upon satisfaction of all technical requirements applicable to Class I wells. If any other formation below the exempted aquifer contains a USDW, the injection would be above a formation containing a USDW and would be a Class IV well, and therefore prohibited.

Under EPA's new Class IV prohibition, therefore, if any USDWs exist below the injection formation, exemption of that formation would not be of any use in avoiding the Class IV prohibition. All underlying formations otherwise meeting the definition of USDW would have to be exempted in order for the facility to be considered a Class I well and potentially permissible.

The Agency, of course, has approval authority over all potential exemptions for purposes of hazardous waste injection, and will exercise this authority quite strictly. First, it is difficult to envision any set of circumstances that would justify the exemption of any surface aquifer, no matter how contaminated, or how unlikely use of the aquifer might be. Such aquifers lack an underground confining layer to contain the waste, and by definition are located close to the surface and hence to potential human contact. In addition, surface aquifers are widely used for drinking water, so that even if a particular area is contaminated or unused, other areas hydrologically connected are likely to be used or usable. For these reasons, it is unlikely that EPA will grant any exemption of a surface aquifer for purposes of hazardous waste injection.

Second, with respect to exemptions of deeper, confined formations, EPA intends to grant exemptions rarely, allowing treatment as Class I only to those injections that can be conducted in a manner that ensures the same level of protection of existing and potential drinking water sources as other Class I wells. In some areas of the country, confined formations exist at depths of

several thousand feet or more that contain water with levels of total dissolved solids in the range of 8,000 to 9,000 mg/l, thus meeting the definition of a USDW. Such aquifers are unlikely to be used or needed for drinking water, however, due to their extreme depth and to their high total dissolved solids content (water above 3,000 mg/l TDS is not generally used for drinking water). In most areas of the country, such aquifers could qualify for exemptions because they typically meet the criteria for aquifer exemptions specified in § 146.4.

Therefore, where an existing disposal operation has been injecting into such a deep, high TDS formation, EPA will entertain exemption of the injection formation and any formations below it that also meet the definition of a USDW, provided the specific aquifer exemption criteria can be met.

The Agency has not yet determined, however, to what extent EPA should approve exemptions in these situations for purposes of allowing new injection facilities to be constructed. For new facilities, the injection zone may not yet be contaminated, which diminishes slightly the argument that the water could never be used. In addition, the added cost of constructing a deeper well initially may be much less than the cost of redrilling an existing well to a greater depth, which supports requiring the new wells to drill deeper. In addition, existing facilities can demonstrate empirically, that their operations have not resulted in contamination of ground water outside the injection zone. New facilities cannot make a comparable demonstration. No amount of modeling can provide the Agency the same level of assurance that a record of actual operation can. The nature of the wastes dictates that EPA, when considering such exemption requests, require that data supporting the requests be thorough and comprehensive. Consequently, EPA will take a hard look at applications for any such exemptions, and decide on a case by case basis whether any may be appropriate.

In any case, no such aquifer exemptions will be made without public notice and the opportunity for public comment as required by 40 CFR 144.7. In addition, EPA at this time considers any exemption for purposes of hazardous waste injection to be a "major" exemption, for which the Agency intends to conduct rulemaking procedures. This will ensure that any such exemptions that are proposed receive the highest public scrutiny and opportunity for comment.

#### *F. Burden to Operators*

Several commenters claimed that the EPA had considerably underestimated the cost of compliance for the regulations and that therefore, the Agency's contention that they were "minor" under Executive Order 12291 was erroneous. These commenters were most commonly owners or operators of enhanced recovery wells, and they based their argument on the loss of oil and gas which could result if the EPA implemented the requirements for limiting injection pressures and/or the cementing requirements specified in Part 147. A few others noted the increased cost of compliance associated with submitting plugging plans, and plugging reports under proposals made in § 144.28 (c) and (d).

After analyzing these comments, the Agency has determined that most of the commenters concluded that the regulatory burden increased because they failed to understand how the requirements applied. About half the commenters appeared not to realize that the proposed limits on injection pressures would not be absolute, but would apply only to wells authorized by rule and could be exceeded by requesting and obtaining a permit to operate at higher pressures. Thus, they based their estimate of loss of oil on an erroneous assumption. In any case, EPA has revised its proposed approach in recognition that the injection pressures should reflect specific hydrogeologic conditions. Under the promulgated approach, pressure limits will be determined on a field by field basis, based on conditions in the injection formation, and thus should have limited impact on owners or operators of enhanced recovery wells.

With regard to the specific cementing and casing requirements set forth in the individual State programs in Part 147, several commenters apparently believed that all owners or operators, of both existing and new wells, would be required to case and cement their wells pursuant to the requirements in the rule. In fact, the casing and cementing requirements in Part 147 clearly apply only "where the Regional Administrator determines that [the well] may not be in compliance with the requirements of §§ 144.28(e) and 146.22," which specify general performance standards requiring prevention of fluid movement. If these standards are being met, the well may continue operation as currently constructed without having to meet any of the specific casing and cementing requirements in Part 147. Based on information supplied by industry there



appear to be very few wells which do not comply with these requirements, so the cost of this requirement should be negligible. In any case, the commenters' belief that all wells would be required to comply with the casing and cementing requirements in Part 147 is erroneous and considerably overestimates the impact of the regulations.

Finally, the Agency would like to note that only the incremental increase in costs associated with this rulemaking are being considered. Several commenters, in evaluating the impact of the regulations with regard to plugging requirements, seemed to believe that the entire burden associated with preparing the plan, maintaining and submitting it should be considered. However, existing regulations in §§ 144.21(c)(5) and 144.22(a)(5) (which EPA plans to recodify as § 144.28(c)) already impose the requirement to prepare a plan. The only new requirement proposed in this rulemaking regarding this section was that owners or operators of rule-authorized wells submit the plan to the Regional Administrator. Thus, only the increased burden associated with mailing the plan need be assessed for this rulemaking. A detailed summary of the burden imposed by the existing program requirements can be found in the June 24, 1980 promulgation of 40 CFR Part 146 (45 FR 42473).

#### G. Application Form

Several commenters pointed out that before full implementation of EPA-administered programs EPA needs to provide a form for application for a UIC permit, and stated their belief that such a form or forms would have to be proposed for comment before they could be issued and used. The Agency does intend that application for UIC permits be made on an EPA form, and has prepared a form for that purpose. This application form, however, reflects only those application requirements currently set forth in 40 CFR 144.31, 146.14, 146.24, and 146.34, and imposes no new requirements. An opportunity for public comment on those requirements has been provided. Furthermore, the elements of the form were announced in the Federal Register and available for public review as part of the Office of Management and Budget's process for clearing information collection requirements at 48 FR 32647 (July 18, 1983). In the same notice, seven other forms were noticed, and the Agency intends to use these forms also in administering the program.

For the information of the regulated community and the rest of the public, EPA is publishing the permit application form and instructions as Appendix A of

this notice. Since the forms do not impose any requirements not already contained in the national minimum standards, and since the public has already had two opportunities to comment on these requirements, the Agency does not believe that it is under further obligation to propose them for comment.

#### H. Aquifer Exemption

In the proposal, the Agency described in detail the criteria for exempting aquifers and the administrative mechanisms to be used in granting various kinds of exemptions. The Agency also solicited requests from operators who believed they were injecting into a USDW which qualified for exemption. These latter are detailed in the preamble to the individual State programs.

One commenter suggested that limiting exemptions to a single class of wells was beyond the purview of the regulations. The discretion to limit exemptions to a particular type of injection practice is, however, inherent in the existing regulations. Section 144.7 clearly grants the discretion to approve or deny the exemption of any aquifer that meets the exemption criteria, and to define the aquifer by vertical limits, lateral limits, or other distinguishing factors. Inherent in this discretion to approve or deny is the discretion to limit the exemption to particular types of practices.

This approach is also consistent with the fact that at least some of the exemption criteria in 40 CFR 146.4 are based on a particular type of injection practice. An aquifer may be exempted, for example, upon a demonstration that it contains oil or gas in commercially producible quantities, making it appropriate for Class II injection, or contains commercially producible minerals appropriate for Class III activities. In such cases, the fact that an aquifer should be exempted for one of these activities does not necessarily mean that it is appropriate to allow potentially more dangerous injections of hazardous or other industrial waste into the aquifer. If an aquifer is appropriate for other types of injections, that can be determined and affirmed in a separate aquifer exemption proceeding designed to look at the specific type of injection for which the additional exemption is being sought. The Agency may, therefore, limit some aquifer exemptions to a particular class or type of injection, in which case other injections into the aquifer will not be allowed unless EPA approves additional exemptions for that aquifer.

The Agency stated in the proposal that exemptions which would be considered "minor," and therefore not subject to the program revision process outlined in 40 CFR 145.32, would include \* \* \* "all exemptions considered as part of a single permitting action \* \* \*" and those exemptions that are for USDWs having greater than 3,000 mg/l TDS and not reasonably expected to supply a public water system (48 FR 40108). The criterion of a single permitting action was chosen because it would ensure that the size of the exemption would be limited to the area around a single well or project and that the aquifer exemption proposal would be subject to public scrutiny in the public participation process that is required for permitting actions.

Since the proposal, however, EPA has realized that some proposed exemptions may be similar in nature and extent to these specified minor exemptions but may never be subject to a permitting action. These would be all exemptions associated with an existing enhanced recovery well or project, since these wells may be authorized by rule for their life rather than required to obtain a permit. EPA intends, therefore, that these types of exemptions will also be considered "minor" and not be subject to full rulemaking procedures. The same concerns addressed by the criterion of "a single permitting action," however, must be met for these additional exemptions. To be considered "minor," all exemptions related to these rule-authorized enhanced recovery wells must be limited to a single well or field, and EPA will conduct the same public participation procedures (set forth in Part 124) for these exemptions as would apply to a permitting action. Of course, no exemption will be granted unless it meets the criteria specified in § 146.4.

#### IV. Response to Comments: Amendments to Part 144

This section discusses comments to amendments and related issues that apply to all Federally-administered programs. The recodification of existing requirements for wells authorized by rule in new § 144.28, and the amendments to § 144.34 regarding emergency permits, are technical amendments and apply both to State-administered programs and to EPA-administered programs. The amendments to § 144.13 regarding Class IV Wells also apply to both State-administered and EPA-administered programs. All other amendments apply only to Federally-administered programs. This is accomplished by including in each amendment the phrase



"for EPA-administered programs only," a form that is already used in various parts of the previously promulgated Part 144 requirements.

*A. Authorization by Rule for Existing Class I and III Wells: § 144.21*

Under the proposal owners and operators of Class I and Class III wells would have been required to apply for a permit within the first year of the program. Without a permit application pending, authorization by rule would terminate after the first year.

Many commenters objected to this requirement. Some maintained that it is impossible in many cases to gather information and prepare a permit within a year. Others noted that this imposes a considerable burden on owners or operators. Some simply voiced a preference for the five year maximum period of authorization cited in the original promulgation. Other commenters expressed support for the proposal, noting that regulation by permit is more effective, both from the perspective of the regulator and the owner or operator.

The Agency has considered these comments and believes that the proposal is a sound approach that does not, in fact, subject owners or operators to any requirements that were not contemplated in the original regulations. As pointed out in the preamble to the proposal (48 FR 40101), the original promulgation allowed authorizations by rule to extend up to a maximum of 5 years. Such a requirement was necessary for some States which had to process literally thousands of permit requests after assuming primary enforcement responsibility. The minimum requirements have always provided that operators of existing wells must submit applications "as expeditiously as practicable" (40 CFR 144.31(c)). For Class II wells in EPA administered State programs, the number of wells may demand several years before EPA can complete the permitting process for all wells. The Agency will, therefore, request applications for these wells on a case by case basis over several years, by using the authority in 40 CFR 144.25. There are a relatively small number of existing Class I and III wells in EPA-administered States, however, and EPA considers the permitting of these wells to be a high priority. Therefore, consistent with the obligation on operators to submit applications as quickly as possible, EPA is specifying at the outset of the programs, by regulation, that for Class I and III wells "as expeditiously as practicable" is one year, and it will require operators to

submit applications within that time. EPA believes that this one year time period is reasonable, and completely consistent with the obligation that already exists in the UIC minimum requirements.

The argument that requiring application within the first year is burdensome and difficult to comply with does not appear valid. First of all, the one year requirement applies to existing operations. In the course of planning, constructing and operating the well, the owner or operator will have gathered most of the information that the Agency requires for a permit application. Indeed, the costs of injection wells dictate that such information be gathered as a function of good engineering practice. The burden, therefore, involves filling out the permit application, a task which should be easily completed in a year.

Accordingly, EPA is promulgating this section as proposed.

*B. Closure of Class IV Wells: § 144.23(c)*

Several comments addressed EPA's proposal to require operators to plug Class IV wells, to submit a plan for such plugging to the Regional Administrator prior to plugging, and to notify him of his intent to plug the well at least 30 days in advance. Several commenters supported the proposal. Others objected to the requirements because of the increased burden on operators. Others contended that the requirement to provide a plan within 30 days was extremely difficult to meet. Some also maintained that notification of the Director 30 days before abandonment was not always feasible, since it is possible that a well might need to be closed immediately.

EPA, after considering these comments in the broader context of the proposal to ban all Class IV injections, believes that the section is important to assure that the Regional Administrator can assess the effect a well may have had on a USDW and to determine whether the health of any persons is threatened. Since in EPA-administered programs, the Class IV prohibition becomes effective within 6 months of the effective date of this regulation, the details of how a well is to be closed are vital.

One commenter stated that the requirement proposed for Class IV well abandonment falls short of plugging requirements proposed for other classes of wells. The commenter pointed to the requirements in 40 CFR 146.10 for other well classes, and claimed that the requirements in § 144.23(c) are less stringent. The same commenter urged that EPA develop both regulations requiring aquifer restoration where the

Regional Administrator deems it appropriate and provisions for groundwater monitoring.

The EPA does not believe that this section is less stringent than plugging requirements for other classes of wells. The requirements are less specific, but appropriately so. Although the current EPA inventory lists relatively few Class IV wells, they are constructed in a variety of ways, and, more importantly, located in varying hydrogeological conditions. Requirements for Class I, II, and III wells are in general applicable to injection activities into a zone which is separated from USDWs by one or more confining zones. Thus, a relatively uniform set of requirements for stabilizing pressures, locating cement plugs and defining methods of placing cement, can be specified to isolate injected fluids in the zone in which they are placed. There is no similar set of requirements appropriate for all Class IV wells. Insuring that injected fluids remain in the injection zone, for example, is of no value if the injection zone itself is a USDW. On the other hand, in certain circumstances, it may be advantageous to plug the well bore and at least isolate the specific USDW into which the fluid is placed. The key point is that there is no typical best way to abandon and "plug" a Class IV well. The Regional Administrator must have the flexibility to require the best method for a particular well. Promulgation of technical design standards for plugging is of no value if in virtually every case the Regional Administrator must develop an alternative.

The Agency does agree with the commenter on two points. Often, the Agency will want to impose groundwater monitoring requirements prior to closing certain wells to determine whether and to what extent the ground water has been contaminated. Section 144.27 will afford this authority to the Regional Administrator. The Agency also agrees that in some circumstances the Agency will want to require aquifer cleanup. Where the Regional Administrator determines that such cleanup is appropriate, he will require it on a case by case basis pursuant to section 1431 or other authorities of the SDWA, and may also draw on the authorities of other statutes such as the Comprehensive Environmental Response, Compensation, and Liability Act. Since the current inventory of Class IV facilities lists so few Class IV facilities, and since the circumstances of each of these wells may vary considerably, the Agency believes that relying on these authorities is preferable to promulgating rules for the few



existing Class IV facilities which will, in almost all cases, be banned.

*C. Additional Inventory Requirements: § 144.26*

The proposal contained some additional information requirements for wells which are either authorized by rule for life or which otherwise may not be subject to permit requirements. Most commenters objected to the additional requirements. Some suggested that, where possible, the EPA should get the information from a State agency or other secondary source. A few supported the need for such information, but questioned whether all owners or operators should be required to submit all the information the needs of the Regional Administrator could be served by only some of the information specified. Lastly, some commenters questioned whether, for facilities with many wells, a "key" well description would satisfy the requirements, rather than a well-by-well report.

The EPA has considered the comments and intends to promulgate the regulation as proposed, for the following reasons. The additional requirements will affect only Class II enhanced recovery owners or operators, Class IV wells (almost all of which will be banned), and some Class V wells. In the case of Class IV facilities, the information is necessary to assess the extent of any damage which may have occurred, to determine appropriate closure methods, and to help determine what future monitoring (if any) might be required. For Class V wells, the information the Agency intends to gather is a part of the Class V inventory and assessment, required in 40 CFR 146.52. Requesting the information as a part of the inventory merely streamlines, for the EPA and the operator, the information collection process. Finally, the need for these data is particularly acute, since both Class IV and V facilities may involve injection into or above USDWs, and therefore, such information is necessary to meet the mandate of the SDWA to ensure that injection does not endanger USDWs.

Class II enhanced recovery operations may be authorized by rule for the life of the operation, a period typically 25 years or longer. The one-time reporting of such simple information as location, construction, depth and operating data—information known and readily available to the operator—is necessary if the Regional Administrator is to evaluate the potential of an enhanced recovery operation to threaten a USDW. Even if such information, accurate and current, were available from State agencies in every case, EPA may not

have ready access to such information in every State where it must administer the program. Furthermore, the SDWA places the burden on the owner or operator to demonstrate that his well does not endanger a USDW. Thus, imposition of this requirement on Class II enhanced recovery owners or operators is necessary for the authorization by rule to be effective consistent with the mandate of the SDWA.

*D. Requiring Additional Information (§ 144.27)*

EPA proposed in § 144.27 to establish explicit authority to require owners or operators of wells authorized by rule to submit additional information beyond that specified in the inventory requirements. The types of information that could be required are broad in scope, encompassing any information relevant to determining whether a well may be endangering underground sources of drinking water. Additional information would not be required of all wells, but only those identified by a specific request of the Regional Administrator. The obligation to submit information would extend only to those types of information specifically identified in the request.

The authority to request additional information would apply to all wells authorized by rule. This authority parallels that already contained in the minimum requirements for wells that receive permits, reflected in the required permit condition that the permittee submit information upon request (40 CFR 144.51(h)). For some of these rule-authorized wells—all those in Classes I, II, and III—existing rules specify a variety of monitoring and reporting requirements, which in most cases will be all the information needed by EPA. Additional information would be requested only for wells of an unusual type or in other special cases. For other classes of wells, no requirements for submission of information exist other than the inventory requirements of § 144.26, and therefore the authority to require additional information is particularly necessary and appropriate to ensure protection of drinking water sources.

In the proposal, EPA identified Class IV and V wells as meeting this description. Although EPA is promulgating a prohibition of almost all Class IV wells, the particularly high potential for endangerment of drinking water makes the authority to require additional information particularly critical to determine the potential damage caused by these wells and the

possible actions necessary for mitigating any such damage.

The authority to request information is equally critical for Class V wells because, although they are less hazardous, they are allowed to continue operation into the future until and unless the Agency determines that more specific standards are appropriate. A wide variety of well types are included in Class V, including a few experimental technologies for which relatively little information currently exists on the potential danger to drinking water. The Agency believes that as a general matter the existing inventory requirements are sufficient to help EPA in determining whether regulatory requirements are necessary for the various types of Class V wells and what these requirements should be. However, the many types of Class V wells and the experimental nature of some of these wells makes it important to have the authority to require additional information in select instances.

A number of commenters expressed the opinion that the proposed authority to require additional information would result in an undue burden on the regulated community. EPA does not believe this is so. The Agency believes that the provision for requiring additional information is the least burdensome alternative among several approaches to determining that contaminants do not migrate into drinking water. Since the authority is designed to be exercised on a case by case basis, not all owners or operators will be required to submit information, but only those of whom information is specifically requested. This is considerably less burdensome than a uniform requirement that certain additional information be submitted by owners or operators of all wells. Furthermore, only the information specifically requested must be submitted, which permits information requirements to be tailored to the specific operation rather than according to uniform requirements that might be inappropriate, in part, to selected operations. Also, this authority is less burdensome than the authority that presently exists to require a permit for the particular well or operation in order to impose the necessary information requirements as permit conditions.

The potential burden of this provision also is small by virtue of the fact that additional information will not be required arbitrarily of any well, but only when the Regional Administrator determines that such information is necessary to determine whether the well may be endangering a USDW. Certain



commenters stated that the proposed authority to require additional information appeared to be potentially applicable to any well without restriction, and suggested EPA should be required to show that a certain prerequisite criterion or standard is met before additional information may be required. In response, by stating in the proposed regulation that the authority to require additional information was for the purpose of determining "whether a well may be endangering an underground source of drinking water in violation of § 144.12," EPA intended that the authority to require additional information be limited to information consistent with this purpose. In order to exercise the authority to require additional information, EPA must have some basis for suspecting that the particular well in question may be endangering or threatening to endanger drinking water, or that the well is of a type that the Agency believes may be particularly likely to endanger drinking water. EPA intends this threshold to be broad and easily satisfied, but believes it nevertheless makes clear that additional information will not be required in arbitrary manner.

Finally, some commenters suggested that EPA establish a mechanism whereby owners or operators could obtain review of the legitimacy of information requests EPA makes under this provision. Because this provision is intended to be a streamlined and uncomplicated mechanism for requiring information, EPA does not believe it appropriate to establish a unique review process for these information requests. If an owner or operator objects to a particular request, however, he has the opportunity under § 144.25 to request that the well in question be authorized by permit rather than by rule. Any information requirements that EPA believes appropriate for the well would then be established as permit conditions, and these conditions could be challenged by the owner or operator according to the existing mechanism for contesting permit conditions. EPA already has the authority to require additional information to supplement a permit application, according to 40 CFR 124.3(c), which requires submission of information necessary to determine what permit conditions may be appropriate.

*E. Plugging and Abandonment: 144.28(c); 144.28(2); 144.28(k); 144.25*

The September 2nd proposal contained five changes in the way EPA handled plugging and abandonment for rule authorized wells. Two of these changes also affected operators of wells

authorized by permit. First, under the proposal, operators would be required to submit the plan required by §§ 144.21(c)(5) and 144.22 (a)(5) to the Regional Administrator; the minimum requirements, however, specified that the owner or operator authorized by rule needed to prepare and maintain such a plan, but was not required to submit it. Second, the Agency proposed that any changes made to the plan had to be reported 45 days before abandonment. Third, the Agency proposed that owners or operators authorized by rule submit the estimated cost of plugging the well. Fourth, the Agency proposed to limit "temporary or intermittent" cessation of activities to periods of less than two years, unless it was demonstrated to the Regional Administrator that the well *will* be used in the future, and that USDWs would not be endangered. Finally, the Agency proposed, in § 144.28(k), that operators submit a report, within 15 days after plugging and abandonment occurred, which would outline the location of the plugs, composition of the cement used, and other relevant technical data.

1. *Submission of plugging plan and post-plugging report.* Several commenters contended that to develop and submit the plan required in § 144.28(c) and to require the post plugging report specified in § 144.28(k) would impose a significant burden on operators. Others found the 15 days for submitting the post plugging plan too short.

EPA does not agree that the requirement to submit the plan in § 144.28(c)(2)(i) represents a significantly increased burden on operators. The requirement that operators develop and maintain a plan for plugging and abandoning wells that is acceptable to the Director is an existing requirement of the UIC minimum requirements regulations. The only additional requirement proposed in § 144.28(c)(2)(i) was that the plan be submitted to the Regional Administrator. Even in cases where the owner or operator has hundreds of wells this is not a significant burden, since to the extent that the wells are similar, are in the same field, and penetrate to the same formation they will be plugged in the same manner and an operator need only submit a single plan covering such wells.

The requirement in § 144.28(k) that the operator submit a report describing how the well was abandoned is a logical result to requiring a plan in the first place. It was proposed in order to give the Director of a program the information he needs to determine if the

plugging was carried out as planned, and if not, to determine how and why the abandonment plan was altered. Nevertheless, the Agency acknowledges that submission of the post plugging report does impose a new requirement on owners and operators. Therefore, the final requirement has been altered in two ways, both intended to ensure that all the necessary information is submitted, in the most efficient and least burdensome manner possible. This is accomplished by using uniform requirements and procedures for providing both the initial plan and the post-plugging report.

First, owners or operators must submit the plan required in § 144.28(c)(2)(i) to EPA on a form provided by the Agency. The Agency is specifying by regulation the elements to be filled out by the operator, and these information elements will be reflected on the EPA form. These consist of the same information elements proposed in § 144.28(k) for inclusion in the post-plugging report. The requirement in § 144.28(k) can thus be satisfied by merely updating that form, highlighting any differences between how the well was actually plugged and how the plugging was described in the plan originally submitted. If there is no change, the owner or operator need only indicate this to the Regional Administrator. The Agency agrees that there is no compelling reason for requiring the report within 15 days. The Agency is therefore extending the time allowed for submitting the report to 60 days, or to the next scheduled quarterly report (unless such quarterly report is due less than 15 days from completion of plugging) whichever is the lesser.

EPA believes that this simplified approach reduces considerably the burden required for compliance with the requirements. Moreover, whatever increased burden there is consists, for § 144.28(c)(2)(i), of merely *submitting* a plan, the preparation of which was already required, and for § 144.28(k) merely updating a form already submitted by the operator. The form to be used was approved by OMB and published for public comment on July 1983 in 48 FR 32647.

2. *45 day notice of plugging, and plugging plan revisions.* Several commenters also complained that requiring operators to submit proposed revisions to the plan 45 days prior to plugging the well was both burdensome and unnecessary. Many of these same commenters also objected to the requirement in § 144.28(j)(2) that operators notify the Regional Administrator 45 days before plugging,



again stating that the requirement was unnecessary, burdensome, or both. In particular, some commenters maintained that the exact date on which a well is to be plugged is sometimes not known in advance as the plugging may be done when a rig happens to be on site, and that failure requiring that the well be plugged immediately cannot be anticipated.

EPA agrees in part, and disagrees in part. The Agency does not agree that either of these requirements are unnecessary. The Agency proposed the notice for planned revisions, § 144.28(c)(2)(i), because it believed the Regional Administrator must be aware of any change in plugging methods in order to assure that the new methods will adequately protect USDWs and that the cost of such plugging is fully covered by the operator's demonstration of financial responsibility. Therefore, when an operator intends to change his plugging plan, it is reasonable to require him to notify EPA in advance, and 45 days assures that the Regional Administrator will have an opportunity to assess the change.

One commenter took issue with the 45 day time period, claiming that such changes could be reviewed in two hours. It is likely that EPA can undertake reviews of changes in considerably less than 45 days as a general practice. Nevertheless, in other instances EPA may have to investigate, consult, and travel to assess the efficacy of the proposed changes. For this reason, EPA believes it is more effective to specify a conservative time period. EPA, therefore, intends to promulgate § 144.28(c)(2)(i) as proposed.

It should be noted, however, that EPA recognizes that actual plugging frequently varies in detail from the proposed plan. For example, plug placements may be made at intervals slightly higher or lower than specified. It was for this reason that the Agency requested post-plugging data. The intent of § 144.28(c)(2)(ii) was to require only more substantive changes to be reported, such as differences in the number or location of plugs, their method of placement, differences in mud weights used, or other significant deviations. EPA has clarified this in the promulgated regulation to provide that only "significant" changes to the "plan" (as opposed to changes in the details of a previously specified method) need be reported. In addition, in recognition of the fact that the need for emergency plugging might preclude compliance with the 45 day notice requirement, EPA is tying the time period for notice of plan revisions to the time period for notice of

plugging in § 144.28(j), which can be less than 45 days in some cases, as discussed below.

The Agency disagrees that the requirement of notice prior to abandonment, § 144.28(j)(2), is not needed. As a general rule, the Regional Administrator should have the opportunity to observe plugging activities should he deem it necessary. The Agency agrees, however, with commenters who suggested that it is not always possible to predict when a well will be or needs to be plugged. The Agency anticipated this problem when proposing § 144.28(j)(2), and provided the Regional Administrator the authority to approve a shorter notice. However, the proposed regulations qualified this authority by stipulating that the period be long enough to allow EPA the opportunity to observe the plugging if it so chose. This is imprecise. It is true that EPA should have the authority to demand sufficient time to witness the plugging in any situation the Regional Administrator deems appropriate. However, if the Regional Administrator determines that an emergency situation demands immediate plugging of the well, he should have the flexibility to authorize plugging immediately and forego the opportunity to witness it, and not be required to delay plugging by the amount of time theoretically necessary to witness the plugging had he chosen to do so. Accordingly, the Agency is changing this section to allow the Regional Administrator to approve shorter notices without qualification.

3. *Temporary abandonment.* The majority of comments on plugging and abandonment focused on § 144.28(c)(2)(iii) which would impose limits on temporary abandonment. The existing minimum requirements provide that an abandoned well must be plugged, but that "temporary and intermittent cessation of activities" will not be considered abandonment. EPA proposed to clarify that a cessation of activities for longer than two years would not be considered "temporary and intermittent" unless the owner or operator could demonstrate to the Regional Administrator that the well would be used in the future and that appropriate steps had been taken to prevent endangerment to USDWs. Any well inactive for longer than two years for which such a demonstration could not be made would have to be plugged.

One commenter claimed that such a requirement could interfere with standby wells for Class I injection activities. Several commenters claimed the requirement was unworkable for enhanced recovery operations since the

issue of whether a well will be used in the future is difficult to predict, being based on the price of oil, the technology and costs for oil and gas recovery, the demand for hydrocarbons, and a number of other factors. Some simply suggested the time period was too short, most noting that 5 years was more appropriate. Some suggested no time period was needed, since operators could use wells first as secondary recovery, next in a tertiary recovery operation, and could conceivably use the well several times within each phase as different injection patterns were tried or needed.

EPA agrees in part with the comments. The requirement that the operator show that the well will be used in the future is overly restrictive for Class II enhanced recovery operations and some Class III operations, both of which are subject to fluctuations in demand, commodity prices, and to developing technologies. In addition, for Class II wells, up to 50% or more of the hydrocarbons may remain in the formation even after secondary recovery operations. This argues in favor of maintaining existing wells in a condition that will allow them to be used in the future to retrieve these resources if advances in retrieval technology or increases in the market value of the resources make it viable. For Class II and III wells, therefore, there may be good reasons for not plugging a well that has ceased operation for periods substantially longer than two years, even though it may not be possible to prove that the well will be used in the future.

The intent of the proposed two year limit on the length of time a well could be considered "temporarily" out of operation was intended to prevent endangerment to drinking water that might result from the neglect of an unplugged well for a long period of time, perhaps because the owner or operator had no real intentions of ever using the well again. After considering the comments, EPA has determined that for Class II and III wells this goal can be achieved by requirements that are more flexible than those proposed.

The final requirements for Class II and III wells, therefore, no longer require a demonstration that the well will be used in the future. Rather, they are designed to ensure that any well that has been taken out of operation is maintained in a manner that ensures no movement of fluids into USDWs. The regulations promulgated today explicitly require notice to the Regional Administrator any time a well is out of operation for more than two years.



Second, at the time of the notice the owner or operator must explain how the well will be maintained during the period of temporary abandonment and demonstrate to the satisfaction of the Regional Administrator that such maintenance will prevent endangerment of USDWs.

Typically, such maintenance could consist of filling the casing with non-corrosive fluid and observing fluid levels at specified time intervals, and conducting mechanical integrity tests periodically to be sure that the well is functional and that the tubular goods are not leaking.

To clarify a concern raised in the comments, EPA does not consider that backup wells in a Class I operation are "temporarily abandoned" when not in use. These wells must be maintained as fully operational wells, since their very utility is their capacity for use as an alternative to the primary well at a moment's notice. EPA will expect to receive reports on these wells just as from fully operating wells, even if they reflect only very intermittent use. Consequently, such wells are not subject to the requirements for temporarily abandoned facilities.

It may also be appropriate to secure the wellhead to prevent access to the well by persons other than the owner or operator during temporary abandonment. The demonstration also requires compliance with the technical requirements applicable to operating wells unless any are waived by the Regional Administrator. The most significant of these requirements is the obligation to demonstrate the mechanical integrity of the well at least once every five years. Requirements that might be waived typically would include the requirement to monitor and report the injection pressure, flow rate, and nature of fluids; since the well would be out of operation, these reports could only consist of notice that no fluid was injected at no rate and no pressure and thus would serve no purpose. Finally, the owner or operator would be required to give notice to the Regional Administrator before resuming injection activities. If during temporary abandonment the owner or operator determines that he will not use the well in the future, he may give notice to the Regional Administrator and proceed with the required plugging procedures.

The treatment described above for temporarily abandoned wells will be applied to operators after the effective date of these programs. At the time of program promulgation, operators may have wells which are temporarily abandoned. These wells need not be plugged if the operator provides notice

of their existence and complies with the requirements for temporary abandonment promulgated today. An owner or operator may choose not to report a well as an existing injection well. However, should he decide to put such a well into operation in the future, he must apply for a permit and receive authorization as if it were a new well.

*F. Financial Responsibility for Class I (Non-Hazardous), II, and III Wells § 144.28(d) and § 144.52(f)*

As a result of the proposal, EPA is promulgating financial responsibility requirements for operators of wells injecting hazardous waste as Subpart F. This section addresses such requirements for other wells. In the proposal, EPA made several clarifications and/or changes to the existing financial responsibility requirements. In one such clarification, EPA specified in § 144.28 a period of one year for operators of wells authorized by rule to submit evidence of financial responsibility.

A few commenters objected to this specification, some maintaining that the time period was too short, others objecting to the requirement that the information be submitted to the Director. After consideration, the Agency intends to retain the requirement as stated, for two reasons. First, submission of evidence of financial responsibility has always been required by the minimum requirements regulations for both permittees and those authorized by rule, and second, the minimum requirements clearly indicate in both §§ 144.21(c)(7) and 144.22(a)(6) that the rules become effective within a year. The requirement to actually submit the plan merely makes explicit a requirement which was implicit in the original promulgation.

The Agency proposed in § 144.28(d)(3) to provide the Regional Administrator the authority to require owners and operators of wells authorized by rule and those authorized for life by a permit to submit updated estimates of the resources necessary to plug the well. Where costs had increased significantly the Regional Administrator could require the owner or operator to revise his demonstration of financial responsibility accordingly.

In general, industry objected strongly to this requirement, while environmental groups expressed strong support. Those who objected believed that there was not that much variation in the cost of plugging wells which are similarly constructed and drilled to similar depths, and noted that the Agency, once it began to implement the program, would be receiving data on the costs as

it received plugging and abandoning plans and reports. These commenters maintained that submission of updated estimates of the cost of plugging represented a needless burden. Others noted that in times of economic instability, such as periods of accelerated inflationary rates, this requirement could be an additional burden on an already stressed economy. Finally, some believed that the requirement should be applied on a periodic basis, most citing 5 years as an acceptable review time.

Supporters argued that the requirement of financial responsibility, i.e., that operators have the resources to plug and abandon a well or wells, dictates that the requirements be updated when costs or economic conditions warrant it.

The Agency believes that both industry and the environmental groups have valid points. The Agency believes however, that for injection wells that are not used to inject hazardous waste, a balanced treatment which achieves the goals of an adequate financial responsibility demonstration can be applied in a less burdensome fashion. As pointed out by some commenters, as these programs are being implemented EPA will begin receiving reports and other information on the actual plugging of wells under the program. As this information is accumulated, EPA will have a reasonable idea of the costs for plugging prevailing in a given area. The costs for plugging will not vary considerably among wells of similar depth and construction in areas of similar geologic characteristics. Therefore, the information received by the Agency in the normal course of administering the program can be used to determine if the plugging costs of existing, operating wells are likely to have risen considerably. Accordingly, the Agency believes that the authority to require individual operators to submit updates of plugging costs at stated intervals is unnecessary, for injection wells since EPA should be able to identify changes in costs relatively easily.

However, it is still important to ensure that the financial responsibility demonstration itself reflects current costs. The regulations have always required the owner or operator to "maintain" financial responsibility not only to assure that the necessary funds are available but also to assure that the amount of the funds are sufficient to cover the current cost of plugging, closing and abandoning the well according to the operator's approved plan. Except for wells injecting



hazardous waste (See Subpart F) the final regulations do not require the owner or operator to submit periodically revised demonstrations. However, if he has reason to believe that a revised demonstration may be appropriate, the Regional Administrator may require owners or operators to submit revised demonstrations.

The EPA solicited comment on what constitutes appropriate criteria for judging demonstrations of financial responsibility and specifically solicited comment on the appropriateness of criteria used in the RCRA program (see 40 CFR Part 264 (Subpart H)). Comment was sharply divided between industry and trade groups on the one hand, and environmental groups on the other. Industry strongly opposed the application of these criteria to injection facilities, noting that an injection facility is different from a hazardous waste surface disposal facility, and therefore warrants different treatment.

Others cited the complexity of the RCRA requirements and maintained that it would be burdensome to both the operator and EPA to apply them. Still others questioned whether the Agency had the economic expertise necessary to meaningfully apply and evaluate these criteria. Some cited the special statutory treatment afforded Class II wells, and maintained that RCRA criteria, if applied, could unnecessarily impede oil and gas production. Other operators of enhanced recovery wells indicated that while such criteria may be appropriate for large corporations, they would severely handicap the small operators, a group that comprises the majority of oil and gas producers.

Environmental groups generally endorsed application of RCRA criteria but many such commenters, joined by some representatives of States or local governments, went beyond the proposal in their comments by strongly recommending that the Agency accept only surety or performance bonds. They maintained that only through bonds could the Agency be assured of access to resources needed to plug and abandon a well.

After consideration, the Agency agrees that bonds are one effective method of proving financial responsibility. The existing regulations, however, allow owners or operators to demonstrate financial responsibility by other means (which EPA believes are at least as effective as performance bonds) as long as the demonstration is acceptable to the Director. The Agency did not propose to change that provision and does not intend to do so at this time.

As discussed in the next section, EPA believes that Class I wells used to inject

hazardous waste should be subject to requirements analogous to those specified for other hazardous waste management facilities in 40 CFR Parts 264 and 265 Subpart H.

With respect to criteria for other types of facilities, EPA does not intend to promulgate specific criteria at this time. Instead, the Agency will use recently developed guidance setting forth those criteria EPA believes, after the study to date, are appropriate to evaluate the major types of possible financial responsibility demonstrations. Individual financial responsibility demonstrations will be evaluated on a case by case basis, with close cooperation with the applicant, using this guidance. If at a future time EPA determines that these or other criteria should be promulgated as uniform regulatory criteria, the Agency will propose regulations to that effect.

#### *G. Financial Responsibility for Facilities Injecting Hazardous Waste: New Subpart F*

EPA has been examining for some time the question of what criteria are appropriate to determine the adequacy of bonds or other demonstrations of financial responsibility. As explained in the proposal, the financial responsibility requirements of RCRA have been under consideration to determine the extent to which they might be applicable to UIC facilities. After analysis of the comments and study of the issue to date, EPA has determined that with respect to wells used to dispose of hazardous waste, most of the RCRA financial responsibility requirements should apply, and is promulgating these standards today as subpart F. Class I hazardous waste wells are major facilities, typically thousands of feet deep, which may require substantial resources to plug properly. In addition, these operators have surface facilities which handle hazardous waste, and they are responsible for complying with the RCRA requirements, in any case. Consequently, with a few exceptions outlined below, the RCRA financial responsibility criteria would appear to be appropriate for hazardous waste injection facilities.

The Agency believes that the requirements in § 264.140(c) are not consistent with section 1421 of the SDWA which requires EPA to have authority over all State and Federal entities. In addition, EPA does not believe requirements analogous to §§ 264.144, 264.145, 264.146 or 264.147 are appropriate for regulating injection wells under the UIC program. These sections apply to post-closure care requirements which because of

differences in disposal technologies, do not apply to the UIC program. Beyond these exceptions, EPA is adapting the requirements in 40 CFR Part 264 subpart H and promulgating them today as subpart F of 40 CFR Part 144.

With respect to the applicability of subpart G to injection facilities, the Agency believes after reviewing the comments and further analyzing the requirements, that many either repeat requirements already in place as part of the UIC minimum requirements, or are more appropriate to the specific technical and regulatory requirements of RCRA. For example, requirements for post-closure care, while a necessary part of RCRA requirements, have no referent in the UIC program since the technology of underground injection is designed to place fluids into confined formations and isolate them from the accessible environment for geologic time. Similarly, 40 CFR Part 264 subpart G specifies procedures and standards for developing, submitting and updating closure plans, for which the Agency has specified comparable standards in the UIC regulations at §§ 144.28(c), 144.28(j), 144.28(k), 144.51(o) and 144.52(a)(6).

The Agency is therefore, only promulgating requirements analogous to § 264.114, which requires that the owner or operator properly dispose of or decontaminate facility equipment or structures which may have residual hazardous waste on or in them.

#### *H. Specifying Annulus Pressure and Fluid: § 144.28(f)(2)*

Section 144.28(f)(2), which is a recodification of the existing minimum operating requirements for wells authorized by rule, requires owners or operators of Class I wells to maintain a fluid approved by the Director in the well annulus, at an approved pressure. For EPA-administered programs, the proposal specified that where wells are completed with tubing and packer, a non-corrosive fluid should be placed in the annulus and a positive pressure applied. One commenter requested that we define non-corrosive. The EPA cannot specify more precisely in a rule what an appropriate fluid is, since it is dependent on the nature of the tubing and casing. All such wells must eventually obtain permits, however, and specific fluids can be established in that permit. Until then, the permittee is simply under the general obligation to use fluids that will not corrode the tubing and casing. Another commenter argued that maintaining a positive pressure on the casing is contrary to current acceptable operating practices and procedures. In fact, the States of



Texas and Louisiana, in which a sizable portion of Class I wells are located, do require owners/operators to maintain positive pressure on the annulus. In addition, one commenter argued that this requirement is not appropriate for wells not completed with tubing and packer. The EPA agrees and had modified § 144.28(f)(2) to make this more explicit.

#### *I. Authority To Require Monitoring Wells: § 144.28(g)(1)(iii)*

Several commenters expressed strong support for requiring the installation of monitoring wells at Class I sites, while others objected to what they believed to be a new requirement to install ground-water monitoring wells within the area of review for Class I wells (§ 144.28(g)(1)(iii)).

Some commenters claimed that monitoring wells were difficult to place in a way which would enable detection of fluids from a deep pressurized formation. They noted that fluids could take literally millions of years to travel to points where they could be detected. Others noted that monitoring the injection well annulus provides a far more effective and quicker means of detecting leaks than installation of monitoring wells. Finally, commenters pointed out that installing monitoring wells in deeper USDWs where they could detect leaks reasonably soon, could actually pose a greater threat than having no monitoring wells. They pointed out that pressurized formations are generally overlain by competent confining zones which serve to contain fluids; penetrating such zones provides an additional potential conduit for contaminants to reach USDWs.

In response, the Agency would like to point out two things. First, it was not the Agency's intent that this section require monitoring wells to be installed, as some commenters apparently believed. The Agency wanted merely to provide authority to the Director to require monitoring wells when he deemed necessary. Second, this is not in fact a new requirement; in § 144.28 the Agency simply recodified the minimum requirements of § 144.21(c)(6) (48 FR 14195). The Agency acknowledges that the changes in language that occurred when the section was codified did not clearly express that intent. To more clearly reflect the fact that the existing provision only granted the discretion to require monitoring wells when appropriate, EPA is adjusting slightly the language of the recodification.

The Agency agrees that in some cases the installation of monitoring wells is either unsound or ineffective. With respect to detection of leaks in the well

casing, monitoring of injection pressure will detect leaks much more readily than will monitoring wells. With respect to the unlikely prospect that the confining layer above the injection formation has been breached, monitoring wells in the surface aquifer are even less effective, due to the extremely long time it would take for injected fluids from deep Class I wells to migrate upward to the surface aquifer. Placement of monitoring wells in deeper USDWs is unsound in many cases, because the act of drilling the monitoring wells will create a route through the confining layers of these deeper formations, possibly increasing the likelihood that fluids could migrate into the more critical shallow formations.

Nevertheless, the Agency does believe that in certain specific cases properly installed monitoring wells may be desirable to have around Class I wells, as reflected in the existing regulatory authority to require them. Given this situation, we believe it appropriate that the specific requirement to install monitoring wells requires a positive action on the part of the Director who must prescribe the number, location and parameters to be analyzed. Because this involves such detailed and site-specific conditions imposing such requirements is appropriate to a permitting action. Since operators of Class I wells must apply for a permit within the first year of the program, and since monitoring wells will not be appropriate in many instances in any case, it is unlikely that the Regional Administrator will need to exercise the authority in this section which applies to wells authorized by rule.

#### *J. Analysis of Injected Fluids: § 144.28(g)(1)(i)*

The Existing minimum requirements state that owners or operators of Class I wells authorized by rule must monitor the nature of the injected fluids "with sufficient frequency to yield data representative of their characteristics" (§ 144.21(c)(6), which EPA plans to recodify as § 144.28(g)(1)(i)). The Agency proposed that for EPA-administered programs this frequency should be once within the first year of authorization and thereafter when changes are made to the fluid. Some commenters objected to this requirement. Another commenter expressed the opinion that the requirement was not stringent enough and that operators should be required to monitor the nature of injected fluid at least once a year, regardless of changes, in addition to doing so the first year and whenever changes are made.

After considering the comments, and reevaluating other relevant

requirements, EPA has determined that the proposed requirement duplicates other requirements and has decided not to promulgate it. In § 144.21(a)(3)(i)(B), EPA has explicitly limited the authorization by rule of existing Class I wells to one year, thus clarifying that the Agency expects permit applications for these wells to be submitted within that time. Since an analysis of the nature of the injected fluids is a required element of the permit application (see § 146.14(a)(7)(iii)), this will require the analysis to be submitted within the first year without the need for a separate requirement. While EPA agrees that monitoring of the injected fluid will be appropriate beyond this initially required submission, the specific frequency or conditions of such monitoring are difficult to specify as uniform requirements for all wells and therefore best handled in the context of permitting. Since EPA intends to bring these wells under permit as quickly as possible, the Agency believes it is not necessary or advisable to attempt to specify monitoring requirements more precisely in the rule for wells authorized by rule.

#### *K. Scheduling and Reporting Mechanical Integrity Tests: § 144.28(g)(2)(iv)(B) and (C)*

One commenter objected to the requirements in § 144.28(g)(2)(iv)(B) which allow the Regional Administrator to specify a schedule for conducting the required mechanical integrity tests. Several others objected to the requirement in § 144.28(g)(2)(iv)(C) which requires the owner or operator to notify the Regional Administrator 30 days prior to conducting mechanical integrity tests.

In both instances, the authority is similar to that used by States in most State-administered programs which the EPA has approved. The Regional Administrator must be able to set schedules for mechanical integrity testing for two reasons. First, it enables him to require wells he believes pose the greatest threat to ground water to be tested earliest. Second, it enables him or his representative to plan in an orderly fashion to observe tests. The existing minimum requirements specify that mechanical integrity must be tested at least once every five years. EPA must be able to spread the burden of witnessing and evaluating tests over that entire period. If the time for conducting mechanical integrity tests were solely at the discretion of the operators, the Agency could be faced with the unmanageable burden of dealing with a huge number of tests at one time.



Operators should bear in mind that EPA will typically not specify a particular date, but only a deadline before which the test must be conducted. This enables the operator to schedule tests within that constraint for his own convenience, subject only to the requirement of 30 days prior notice to EPA. The Agency would also like to point out that early scheduling of the mechanical integrity test can, in some circumstances, work to the owner's or operator's advantage by helping the Regional Administrator to ascertain that a certain well or type of well is safe. This would ensure that the well would not be subject to more extensive requirements, such as additional casing and cementing requirements, that might be imposed if the Regional Administrator has reason to believe that the well was of a type that presented a danger to USDWs.

The requirement that owners or operators notify the Director 30 days prior to conducting a test must be an integral part of any program which relies on self-monitoring. To be effective, the Regional Administrator or his representative must have the opportunity to observe any tests done. This provision also allows the Regional Administrator to accommodate any exigent circumstances that would make testing appropriate on shorter notice by approving a shorter notice period.

Accordingly, the Agency is promulgating these sections today as they were proposed on September 2, 1983.

*L. Retention of Records: (§ 144.28(i); § 144.51(j)(2)(ii))*

The existing minimum requirements provide, both for wells authorized by permit and wells authorized by rule, that records of the nature and composition of injected fluids be retained until three years after the completion of plugging and abandonment procedures. EPA has proposed that for EPA-administered programs the owner or operator be required to deliver the records to the Regional Administrator at the end of the three year period, or obtain written approval before the records may be discarded.

Several commenters expressed the opinion that the obligation to retain records be limited to three years from the time the records were made, rather than three years from the final plugging of the well. While EPA will take these suggestions under consideration, the Agency is taking no action on them at this time. The retention period of three years from plugging and abandonment was established in the existing minimum requirements after proposal and public

comment, has already been subject to judicial review, and was not reopened for comment in the September 2, 1983 proposal.

Some commenters also objected to the proposal that owners or operators be required to deliver the records to EPA or obtain approval before they can be discarded at the end of the three year period. Another commenter claimed, on the other hand, that owners or operators should be required to retain records for longer periods, because groundwater contamination may not become apparent until years after injection activities have ceased. EPA has decided to promulgate this requirement as proposed. The Agency believes that the requirement to deliver to EPA or obtain approval to discard is necessary so that EPA may consciously decide whether the Agency should acquire the records to retain them for a longer period or whether disposal of the records is appropriate. The Agency also believes that the requirement is not a significant burden on the owner or operator, since it does not impose any longer retention period, but only the opportunity for EPA to check whether the records may be discarded. At the same time, the requirement to deliver the records to EPA will give the Agency the opportunity to ensure that they are kept for longer than a three year period when that is appropriate.

*M. Notice to Surrounding Landowners: § 144.31(e)(9)*

The Agency received considerable comment on the proposal to notify owners or tenants of land within ¼ mile of the site. In general, industry opposed the requirement strongly, while environmental groups expressed strong support for the requirement. Those who objected pointed out that in urban areas this requirement could result in the operator having to contact thousands of people. Operators of enhanced recovery wells in Appalachia and in the midwest noted circumstances in which enhanced recovery wells, both planned and existing, were literally in the center of sizable towns. Commenters also objected to what they believed to be the imprecise legal use of the word tenant, noting that where mineral and oil rights are involved, there may be several layers of renters, leasers and owners for a single piece of property.

Supporters noted, however, that this is the surest method of notifying the parties most interested in a permit application. One commenter suggested that in some cases no other means exists to contact interested persons. One commenter supported the idea of

notification, but felt a ½ mile radius was more appropriate.

EPA recognizes the merit in both arguments, and is adopting a compromise approach designed to ensure individual notice to the greatest degree practical while minimizing the burden on the applicants. In particular, EPA recognizes that the term tenant does not precisely identify the persons who must be given notice, and that in any case it will be difficult to locate the name and address of any persons associated with nearby property other than the owner of record. EPA therefore is eliminating the responsibility to identify tenants, and will extend the requirement only to owners of record; the applicant should be able to identify these by reference to city or county files. EPA is aware that in some cases the owner of record may reside elsewhere and may not be the party most directly concerned with potential injection facilities in the area. The Agency believes, however, that notice to owners of record will reach at least a significant number of truly interested parties, that owners may well pass any notice they receive on to their tenants or lessees, and that once notice is provided to some members of the community it is likely that the information will spread by association and word of mouth to other potentially interested citizens.

In addition, EPA has decided not to require the applicant to send notice to the landowners, but simply to compile and submit to EPA a list of such owners. EPA will then add these names to the mailing list of interested persons and notify the listed persons of significant permitting actions as provided in 40 CFR Part 124. This ensures that notice will be given to the owners in the area, while minimizing the burden to the applicant.

Finally, commenters concerned that sufficient notice be provided should remember that this requirement for providing a list of nearby landowners is in addition to existing public notice requirements. In all permitting actions, notice will be provided according to the requirements of 40 CFR Part 124, including publication in the newspaper of permitting actions concerning a major facility.

## V. State Specific Requirements

### A. Introduction

Part 147, being promulgated today, contains requirements which supplement or specify those found in 40 CFR Parts 124, 144, and 146. These are requirements which—due to geologic, historical or hydrologic conditions—differ from State to State or region to



region. In addition, this Part presents more specific requirements which exercise the discretion granted to the Director in the more broadly stated requirements of the minimum requirements. The following sections contain discussions of comments received by the Agency in response to the proposal. Some comments were general in nature, questioning an approach or requirement proposed for several State programs, while others addressed specific requirements in particular State programs. The general comments are addressed collectively in this section of the preamble, while the State-specific comments are covered in the preambles to the individual State programs.

A description of permitting schedules, mechanical integrity testing schedules, aquifer exemptions, and other administrative considerations can be found in the program description for each of the State programs promulgated today. Program descriptions are available at the appropriate Regional Offices.

#### *B. Maximum Injection Pressure*

The existing minimum requirements in Part 146 (applicable to wells authorized by rule by virtue of § 144.21(c)(6) and § 144.22(a)(9) to be recodified at § 144.28(f)(3)), require owners and operators to limit the maximum operating pressure to levels that comply with general performance standards. For Class I and III wells, this maximum pressure may not fracture the injection zone, except during well stimulation, and in no case may fracture the confining zone. For Class II wells, the maximum pressure may not fracture the confining zone.

In the proposed regulation, the EPA attempted to prescribe, for each Federally-implemented program, a specific maximum injection pressure for wells authorized by rule which reflected the geologic and hydrologic conditions found in the respective States. Under the proposal, owners and operators could receive authorization to inject at higher pressures than those specified in the rule by applying for a permit, if they could demonstrate that a higher pressure could be allowed without endangering USDWs.

The Agency received a substantial number of comments on this issue, primarily from owners or operators of Class II enhanced recovery facilities. In general, nearly all commenters believed the values proposed by the Agency were too low. Several noted that the formula proposed by the Agency ignored friction loss in the pipe. Others said that the proper concern of Federal regulations

should be assuring that the cement and tubular goods used in well construction are properly designed, constructed and maintained, and that maximum injection pressures need not be imposed. Owners or operators of enhanced recovery operations pointed out that the performance standard in § 146.23 prescribes that injection activities not fracture the confining zone adjacent to the USDW, while the proposed values appeared to be based on fracture data from the injection formation. Class II operators also maintained that enhanced recovery operators have vested interest in preventing fractures to both the injection zone and the confining zone, since fractures in the injection zone may reduce the efficiency of the sweep, and fractures in the confining zone could result in loss of hydrocarbons and increased horsepower requirements. Still others noted the difficulty of propagating fractures vertically, particularly across bedding planes. They argued that although at depth fractures are generally oriented vertically, they propagate radially, and are therefore, unlikely to extend upward to the confining layer. They further noted that the differences in the mechanical and hydrogeologic properties of confining zones and injection zones serve to prevent fractures from entering and moving through the confining zones.

In addition, most commenters pointed out that areas with common fracture gradients do not generally correspond to political boundaries. They noted that suggesting a single value for an entire State could result in some operators injecting at pressures that exceeded safe limits, while forcing others to reduce injection pressures well below safe limits. Finally, some operators noted that the efficiency of an enhanced recovery operation is directly related to injection pressures and they maintained that under our proposed limits many operators would be forced to shut down, to continue operations at substantially reduced efficiencies, or to apply for a permit.

The Agency agrees with many of these comments. In particular EPA agrees that factors which determine appropriate injection pressures are specific to the particular injection formation, rather than being uniform across an entire State. It was for this reason that we proposed to allow owners or operators to receive authorization to inject at higher pressures by applying for and receiving a permit.

For Classes I, III, and Class II salt water disposal wells, this approach remains a valid alternative for two

reasons. First, owners or operators of these wells must eventually apply for and receive a permit in any case: Classes I and III well operators must apply no later than 1 year from the effective date of this program; Class II saltwater disposal well operators within 4 years of that time.

Thus, Classes I and III wells will be required to have submitted an application by the time the rule becomes effective. In addition, all owners or operators must be in compliance with the performance standards in § 144.28 within the first year of the program.

In the case of saltwater disposal wells, those operating at relatively high pressures who wish to continue at those pressures will be required to submit a permit application within the first year, whereas the rule allows up to 4 years. However, under the criteria for requiring permits (40 CFR 146.09) owners or operators of wells operating at higher pressures would likely be among the first called in for a permit. In any case, these owners or operators would likely be required to apply for a permit well before the 4 year maximum period, regardless of whether this rule were promulgated or not. These owners or operators fall into two groups: those for whom the specified maximum injection pressure is appropriate, and those who may seek permission to operate at higher pressures. For the latter, this requirement does not appreciably alter the schedule for permit application or increase the burden of compliance. For the former, there is no problem.

Second, for Class II saltwater disposal wells (SWDs), Class I wells and at least some Class III wells, the economic incentive to retain fluid in the injection formation (cited by operators of enhanced recovery operations) is not present.

For these reasons, the EPA is promulgating the maximum injection pressures for the Class I wells, Class II saltwater disposal wells, and Class III wells as proposed on September 2. The EPA recognizes that these proposed values are conservative. However, the Agency believes that adoption of a conservative value is appropriate for these wells. Both the statute and the minimum requirements dictate that the UIC program, whether administered by the EPA or the States, be a preventative one. The approach recognizes that both economically and technologically, it is easier to prevent an USDW from being contaminated than it is to restore a USDW once contaminated. Moreover, a preventative program serves to protect human health, the primary aim of the Safe Drinking Water Act.



Thus, since there is neither an economic nor a technical incentive for owners or operators of Class I, Class II saltwater disposal wells, and many Class III wells to prevent fracturing of the confining zones, and since they must apply for a permit in any case, the EPA intends to promulgate the requirements for these wells as specified in the September 2nd proposal.

However, based on the comments and further analysis conducted by the Agency, the EPA believes that enhanced recovery operations and hydrocarbon storage wells are sufficiently different from disposal operations—both from a legal and regulatory perspective, and in terms of the goal of owners or operators—that they warrant a different approach. The EPA decided that enhanced recovery and hydrocarbon storage wells warranted a different approach for three reasons.

First, as indicated in the comments, the appropriate maximum injection pressure that will protect underground sources of drinking water while still allowing efficient operation will vary considerably within a given State, depending on the characteristics of the particular formation into which injection is occurring. A single conservative statewide value is appropriate for other types of wells, since operators of these wells will, in any case, be required to apply for and receive permits and authorization to inject at a higher pressure can be approved in the permitting context on a case by case basis as appropriate. Existing enhanced recovery and hydrocarbon storage wells, however, are authorized by rule for life under EPA's existing regulatory scheme, and thus in general will not be required to obtain permits. Were EPA to apply a single conservative statewide maximum pressure to these wells, it would require the majority of them to apply for and receive permits in order to operate at a higher, more appropriate pressure, something the Agency did not intend. For these wells, therefore, it is important to devise a regulatory scheme to specify more appropriate, formation-specific maximum pressures without requiring permitting of most wells.

Second, the regulatory standard for the maximum injection pressure is different for Class II wells than for Class I or III wells. Specifically, for Class II wells § 146.23(a) dictates that owners or operators may not fracture the confining zone above the injection formation a standard which allows the injection zone itself to be fractured. Sections 146.13(a) (Class I) and 146.33(a) (Class III) dictate that pressures not exceed a maximum which would allow fracturing

of the injection formation (see preamble discussions on page 42472 of FR May 18, 1980, June 24, 1980). The different standard for Class II wells makes it less likely that the standard will be exceeded in normal operation.

Third, the Agency accepts the premise that, in many cases, owners or operators of enhanced recovery wells and hydrocarbon storage wells have a vested interest in not fracturing confining zones, thus decreasing the risk that such fractures will result. Consequently, while a permit is the appropriate vehicle for identifying and authorizing increased injection pressures for most owners or operators, the Agency believes that enhanced recovery operations and hydrocarbon storage wells justify using a different approach.

For these reasons, EPA will not require owners or operators of existing enhanced recovery or hydrocarbon storage wells to meet the single conservative Statewide numbers promulgated for other existing wells. Instead, the Agency is promulgating rules that will enable it to establish specific maximum injection pressures on a formation by formation basis.

The Agency does not currently have sufficient data, in most cases, to establish such pressure limits immediately. Therefore, the promulgated rule requires the owner or operator of each enhanced recovery or hydrocarbon storage well or field to submit certain information that will enable EPA to establish an appropriate pressure for each injection formation used. Although this information submission requirement imposes a slightly increased burden, it is far preferable from the standpoint of both the Agency and operator to preparing, processing, and issuing permits for all these wells. In addition, existing regulations impose on such operators the obligation to submit inventory information, and the information relevant to injection pressure can simply be added to the inventory information in a single submission.

Once EPA receives this information, and any other information from other sources or already in Agency files, it will act quickly to establish appropriate pressure limits for each formation. The Agency intends to conduct public participation procedures for the establishment of such pressures, following the procedures in Part 124 that apply to permitting actions, except that all operators in the subject field or formation will be affected by the proceedings rather than a single applicant. After these procedures are

conducted, the Agency will establish a final pressure limit, and inform all owners or operators in the area of the applicable limit.

The Agency intends to base these formation-specific pressure limits on the fracture pressure of the injection formation. Since the existing general regulatory standard for Class II actually allows fracturing of the injection formation, and prohibits only fracturing of the overlying confining zone, setting the maximum injection pressure at this level will ensure a large safety margin while still allowing the great majority of operators to operate at prevailing, economically efficient pressures.

The Agency recognizes that some enhanced recovery operations typically are conducted at pressures at or slightly above the fracture pressure of the injection zone, and that these activities can still be safely conducted without fracturing the confining layer. EPA would like to examine these activities on a case-by-case basis, however. Therefore, even after EPA has established field-specific injection pressure limitations, the Agency will consider allowing higher pressures case-by-case with the approval of the Regional Administrator. An owner or operator desiring such a variance must request and obtain the written approval of the Regional Administrator. If the owner or operator is dissatisfied with the Regional Administrator's response to his request to operate at higher pressure, he may then apply for a permit and challenge the permit if he fails to receive permit conditions that he believes are appropriate.

The Agency believes that the promulgated approach is a balanced one, that meets three important objectives. First and foremost, it maintains the protective standard of the existing UIC program and provides for the establishment of specific values as necessary to implement that standard. Second, it achieves a high degree of consideration of conditions that vary across a State and can, therefore, avoid the unnecessary burden that would be imposed by a more conservative and less tailored standard. Third, it accomplishes these objectives in the least burdensome manner possible, without requiring permits from these wells and without requiring a well by well examination of the great majority of them.

#### C. Casing and Cementing Requirements

The Agency proposed casing and cementing requirements in Part 147 which the Regional Administrator could impose on operators of wells authorized



by rule for life, when they were not in compliance with the existing minimum requirements in § 144.22(a)(8) (to be recodified at § 144.28(e) and § 146.22.) These sections essentially state a performance requirement that wells be " \* \* \* cemented and cased to prevent the movement of fluids into or between strata \* \* \* "

Several comments were received on this proposal. One commenter, whose comments were supported and referenced by several others, cited the difficulty of recementing existing wells, and noted that perforating the casing to do a squeeze job could ultimately create other problems in the well. The same commenter noted that the specific technical requirements, such as volumes of cement and intervals of cement required, were often difficult if not impossible to meet. They also suggested that wells which showed no evidence of leaks should not be required to recement. Finally, they contended that allowing the Regional Administrator to specify other requirements to meet the standards in §§ 144.28(e) and 146.22 was too open ended and broad.

Other commenters contended that the requirements could be difficult to comply with, but were supportive of the Agency's intent to apply them only when a well violated the performance standards in the minimum requirements. One commenter claimed that the best method of assuring compliance was to develop a remedial program specifically tailored for the specific well in violation.

The EPA agrees in general with these comments, but does not believe that these considerations require altering the proposed requirements. Indeed, many of the comments were based on the misconception that the specified casing and cementing requirements were applicable to all wells authorized by rule, and suggested the approach that EPA in fact proposed and is promulgating. In all State-specific programs, the regulations make clear that the casing and cementing requirements apply only "where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of § 144.28(e) and § 146.22." Thus, the requirements do not apply to all existing wells, but only to those that may be causing a problem.

The Agency also agrees with the commenters who suggested that in some cases the specified requirements may not be applicable to an individual well. When this is the case, the Regional Administrator may prescribe specific alternative requirements appropriate for the well or wells in question. EPA is

adjusting slightly the language in the various State-specific programs to make this clear. Alternatively, the Regional Administrator may require the owner or operator to apply for a permit, which would also allow different but appropriate requirements to be prescribed. It is for this reason that the Agency disagrees with the contention that allowing the Regional Administrator to specify alternatives is too open ended. It is precisely this flexibility that is needed to meet the unique requirements of specific wells. The Agency specified the cementing requirements merely to establish a representative standard for the technical and construction requirements which it intends to apply to owners or operators who are not in compliance with applicable performance standards. Obviously, where it is not feasible to apply these requirements, the Agency will not do so.

In addition, owners or operators should note that these requirements were included to provide the Regional Administrator with a remedial alternative that is less burdensome to both the Agency and the owner or operator than requiring a permit. It was the Agency's intent to develop a mechanism which allowed the Regional Administrator, when he deems appropriate, to require owners or operators to correct specific technical problems without triggering administrative burdens on the owners or operators.

The EPA believes the approach outlined in the proposed sections provides just such a mechanism. In a case where the owner or operator believes that the exercise of this section is unreasonable, he may, under § 144.25(c), request that he be excluded from coverage by rule and be authorized by permit, in which case appropriate requirements can be established in the formal permitting process.

The Agency is promulgating this requirement today in the selected State programs as proposed, with the minor clarification of the authority to specify alternative requirements as discussed above.

#### *D. Mechanical Integrity*

Section 146.8 of the existing minimum requirements defines mechanical integrity and specifies tests which verify well integrity. The section also allows the use of alternative tests to demonstrate well integrity after approval by the Administrator. There are two aspects to mechanical integrity. First, a well must be free of significant leaks in the tubing, casing, and packer(s), and cement, and second, it

must not allow significant movement of fluids in the well bore.

In several instances, existing well construction, prevailing operating practices, and other factors make it difficult to apply the specified tests or make other demonstrations more practical. For these cases, the agency sought comment on alternative tests. Discussions of the comments received appear in the preambles to the specific state programs which requested such comments.

#### *E. General Application of the Arkansas Plugging and Abandonment Requirements*

The Agency proposed that the plugging and abandonment standard specified for the Arkansas program be generally applied to all State programs. This requirement contained specifications for the size, length, and location of plugs, and other detailed technical requirements.

Several commenters expressed strong support for this approach, noting that requirements were detailed, comprehensive, and specific. On the other hand, other commenters noted that these requirements, while appropriate for Arkansas which has several producing strata under various pressures, make little sense in other parts of the country. Some commenters also noted that the cost of compliance with these requirements was considerable, since it could significantly increase the time a rig would need to be on site.

The EPA has considered the comments, and after analysis believes these regulations may not be appropriate for many areas of the country. The Agency also believes that the requirements in §§ 144.28(c) and 144.52 specifying the required elements of plugging and abandonment plans make it unnecessary to promulgate such specific standards since, under § 144.28(c) the Agency will have the opportunity to assure that the well will be plugged in a manner acceptable to the Regional Administrator. Thus, since the Agency will have the opportunity to review plugging plans, and the proposed requirements are not necessary—and in some cases not appropriate—in all areas, the EPA has decided not to specify them in a rule. As explained above, the Arkansas program itself is not being promulgated because EPA has since approved the State-administered program.



## VI. State Specific Requirements— Individual Programs

### SUBPART C—ALASKA

Subpart C requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144 and 146. In addition, this subpart includes regulations that supplement the UIC regulations where discretion is allowed in order to make the Alaska UIC program appropriate and amenable to the combination of historic practices and geology unique to Alaska. The regulations promulgated today incorporate 40 CFR Parts 124, 144 and 146 in the UIC program for Alaska. A discussion of major issues raised by commenters and the way in which the supplemental regulations have been modified to reflect public comments follows.

#### State Primacy

Several commenters requested that the State implement the Underground Injection Control (UIC) program for Alaska. These commenters argued that the State possesses greater expertise in dealing with injection activities and can better respond to the unique needs of the regulated community. EPA recognizes that the UIC program was intended by Congress to be implemented by the States whenever possible. Alaska, however, has chosen not to seek primary enforcement responsibility for the UIC program. Where States are unwilling or unable to implement the UIC program, Congress requires EPA to conduct the program. Should the State, at some later date, choose to seek primacy for the UIC program, and if the State program is approved by EPA, the Federally administered program will be rescinded.

#### Aquifer Exemptions

Aquifers underlying and one-quarter mile beyond the boundaries of six oil and gas producing fields were proposed for exemption for Class II injection activities in the initial program proposal. The aquifers deeper than 1,700 feet below the ground surface were proposed for exemption for the Swanson River and a Beaver Creek fields. All aquifers underlying the Granite Point, McArthur River, Middle Ground Shoal and Trading Bay fields beneath Cook Inlet were proposed for exemption.

As a result of comments received on the initial proposal, the exemption for the Beaver Creek Field was revised to apply to aquifers deeper than 1,650 feet below the ground surface. The revision was made through legal notice in major newspapers in Alaska and through direct mailing to over 130 persons and

organizations on EPA's UIC mailing list. There were no objections to the revision; therefore, the aquifer exemption for the Beaver Creek Field will apply to aquifers deeper than 1,650 feet below the ground surface.

There were no objections to any of the other proposed exemptions; therefore, they will become effective as originally proposed.

Requests were made to exempt aquifers beneath two other oil or gas producing fields. EPA was not aware of the need for these exemptions at the time the program was originally proposed.

As a result of the requests, aquifers deeper than 1,300 feet below the ground surface and one-quarter mile beyond the boundary of the Kenai Gas Field, and all aquifers underlying and one-quarter mile beyond the boundary of the Kuparuk River Unit were subsequently proposed for exemption for Class II activities. These aquifer exemptions were proposed along with the Beaver Creek reproposal described above. There were no objections to these proposed exemptions; therefore, they will become effective as proposed.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressures measured at the wellhead. For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.103 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3) notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to these comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that operators of such existing wells should be able to meet this requirement without significant change in current operating procedures.

As pointed out in the Introduction, operators who wish to inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II

salt water disposal wells must apply for a permit in any case; the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on the injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced recovery injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow operators who wish to operate at pressures higher than the specified limit to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to



establish appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate use in establishing the field rules are:

1. Instantaneous Shut In Pressure: ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open, to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. Formation "breakdown pressure": indicated values from data recorded prior to and during Squeeze Cementing(1), Acidizing and Acid-Fracturing(2),(3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. Water (or other fluid) injection "Step-Rate" (3), (4), (5) type testing performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. Other reliable field tests or performance data which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone; i.e., that the confining zone(s) have not been breached.

In no case is the operator of a Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will neither endanger the safety of USDWs as provided for in § 144.12, nor fracture the confining zone as required in § 146.23(a)(1).

#### *Casing and Cementing*

Casing and cementing requirements are needed to prevent the movement of fluids into or between underground sources of drinking water. The minimum

requirements when promulgated in June 1980, contained performance standards in § 146.22 but did not specify specific technical standards. The requirements proposed in § 147.104(b) and promulgated today are considered to be appropriate in preventing such fluid movement. Several commenters suggested that EPA defer to state casing and cementing requirements. While EPA will consider the state requirements when it imposes casing and cementing requirements on a case-by-case basis, it cannot defer solely to state requirements. In addition, as explained in the Introduction, the casing and cementing requirements specified in § 147.104 apply only to wells which may be allowing fluid movement into a USDW. Therefore, if existing construction requirements are adequate to prevent fluid movement, or if there are no USDWs which may be affected by the injection activity, the requirements of § 147.104(b) would not apply. (A more complete discussion of this requirement can be found in the Introduction to this section). For the above reasons, the casing and cementing requirements proposed in § 147.104(b) are being promulgated as proposed.

#### *SUBPART D—ARIZONA*

Subpart D requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144 and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed in order to make the Arizona UIC program appropriate and amenable to the combination of historic practices and geology unique to Arizona.

#### *Exempted Aquifers*

Subsequent to program promulgation, facilities which are injecting into an underground source of drinking water will become illegal unless that aquifer or a portion is exempted. However, EPA is not aware of any injections into a USDW and, therefore, is not exempting any aquifers at this time. Owners or operators should determine whether their facilities are injecting into a USDW as defined in § 146.3. Should an owner or operator find that he is injecting into a USDW, he may request an exemption consistent with criteria and procedures in 40 CFR 144.7 and 146.4.

#### *SUBPART E—ARKANSAS*

Since the September 2, 1983, proposal of an EPA-administered program for Class II wells in Arkansas, the State has submitted a final application for primary enforcement authority for a program to regulate these Class II wells. After

careful review, EPA determined that the State's application was adequate, and approved the State-administered program. This approval eliminates the need to promulgate an EPA-administered program for Class II wells in Arkansas. For this reason, the EPA withdrew the notice of hearing and is not at this time promulgating a Federal program for Arkansas.

#### *Other Classes*

A program regulating Classes I, III, IV, and V wells administered by the State has already been approved.

#### *SUBPART F—CALIFORNIA*

Subpart F requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed in order to make the California UIC program appropriate and amenable to the combination of historic practices and geology unique to California.

A Class II program administered by the California Division of Oil and Gas has already been approved. Therefore, EPA will not promulgate regulations for Class II wells.

#### *Aquifer Exemptions*

During the recent public comment period, numerous commenters requested that EPA list, or include by reference, aquifers currently exempted for Class II activities defined in § 146.5(b). Accordingly EPA is maintaining a list of aquifers exempted for Class II injection activities which were exempted under the EPA approved State program for Class II wells. Descriptions of aquifers exempted are available from the EPA Regional office and from offices of the California Division of Oil and Gas. These aquifers have been exempted for Class II activities only. Operators may request permission to inject fluids associated with other classes of well operation by applying for exemptions under § 144.7.

Many commenters requested, or incorrectly inferred, that exemptions granted for Class II activities extend to other classes of operation, such as injection of hazardous industrial wastes. EPA maintains discretion to approve or deny applications for all aquifer exemptions. Exemption may be granted either for entire aquifers or for specifically designated portions of aquifers. EPA reserves the same discretionary authority to approve or deny aquifer exemptions for injection of fluids of specific chemical composition, or related to specific classes of wells as



defined in § 146.5. Aquifer exemptions approved for Class II operations, therefore, do not apply to injection of other types of fluids unless EPA grants further class-specific exemptions.

Moreover, in the case where EPA grants primary enforcement authority to a State only for a single class of wells, as in California, Agency action or requests for exemptions is limited to the class for which the State has authority.

The preamble to the September 2, 1983, Federal Register notice stated that EPA was unaware of any injections into a USDW and, therefore, did not propose to exempt any aquifers at that time. During the comment period, several commenters identified specific aquifers into which they were currently injecting fluids and for which they were requesting aquifer exemptions. EPA has contacted the commenters and has obtained additional information.

In one case, nonhazardous fluids are being injected into a USDW. According to § 146.5, this is a Class V well. At this time, aquifer exemptions are not required for the operation of Class V wells unless the injection would violate § 144.12. In the other case, hazardous waste is being injected into a USDW. EPA is in the process of reviewing this aquifer exemption request. If the review supports the exemption of any aquifer, EPA will provide public notice of its proposed determination. EPA believes that there is sufficient time to exempt any aquifer which meets the criteria before the prohibition of Class IV wells goes into effect. Of course, the facility may only be authorized if as a result of the exemption request, it becomes a Class I well as clarified in § 144.13(d).

#### *Maximum Injection Pressure*

For the State of California, the proposed fracture gradient to be used in the maximum injection pressure equation has been increased from 0.60 psi/ft to 0.733 psi/ft for Class I and Class III wells authorized by rule. Class II wells are permitted by the California Division of Oil and Gas. EPA elected to adopt the revision after review of comments received during the public comment period and in accordance with the policy to promulgate regulations which are neither lax nor pose excessive burdens upon injection well owners and operators. The revised value has been selected, after examination of published materials, to maintain consistency with a majority of EPA programs administered by EPA. Although fracture pressures may vary depending upon the geologic formations, depth, permeability, pore pressure and other factors, investigations confirmed that the maximum injection pressure computed

using the revised fracture gradient will continue to provide adequate protection against formation fracturing and resulting migration of fluids into or between USDW's.

A significant number of commenters charged that 0.60 psi/ft initially proposed for use in the maximum injection pressure equation is overly restrictive. They requested that the fracture gradient be increased to conform with the value proposed for other States. Many commenters suggested that EPA alternatively establish fracture gradients on the basis of accepted standards for specific oil fields or Regions within States. At this time geologic data is sufficiently sparse, however, to preclude such an approach.

Many commenters objected to the use of the simplified maximum injection pressure formula on the basis that it ignores site-specific hydrogeologic and engineering factors which affect formation fracture pressures. Commenters typically noted that the formula neglected frictional losses within injection tubing, which may become significant for projects injecting large volumes of effluents into deep formations as is practiced in California. They further stated that the formula is inflexible and denies operators the opportunity to invoke empirical formation testing methods to establish formation fracture pressures.

EPA will apply the simplified maximum injection pressure equation for injection wells authorized by rule. EPA recognizes that the equation serves as an approximation for complex hydrogeologic and engineering considerations which influence local formation fracturing. Owners and operators seeking an exclusion from the requirement to apply the simplified maximum injection pressure equation as proposed in 40 CFR 147.253 may apply for a permit under § 144.25(c) in which they must demonstrate that operation will not violate § 144.28(f)(3). Operators of Class I and III wells must apply for a permit no later than 1 year from the effective date of this program in any case. Upon the effective date of these regulations and until a permit has been granted by EPA, operators must adjust project operation to conform with maximum injection pressures established by the simplified equation.

#### *SUBPART G—COLORADO*

Owners and operators are required to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this Subpart G of 40 CFR part 147 contains supplemental regulations where discretion is allowed in order to make the Colorado UIC program

appropriate to the historic practices and geology specific to the State of Colorado. The UIC program for Colorado promulgated today applies to Indian and non-Indian lands for Class I, III, IV and V wells, and to Indian lands only for Class II wells, except that a program for operations in the Ute Mountain Reservation will be proposed at a later date.

#### *Aquifer Exemptions*

EPA regulations allow the Administrator of EPA to exempt specific aquifers if the aquifer meets the criteria established in § 146.4.

The Agency proposed to exempt those portions of aquifers within one-quarter mile of existing Class II wells in Colorado for the purpose of Class II injection activities only. A listing of such aquifers was prepared and made available for review at the EPA Regional Office in Denver beginning on September 2, 1983. There were no requests made for review of that listing. However, since the State will administer the Class II program, EPA will approve the exemptions in a separate action, if appropriate. All Class III and IV injection wells which are injecting into an underground source of drinking water in Colorado, as defined at § 144.3, where such aquifer has not been exempted for that Class of well, become illegal subsequent to the promulgation of this program.

EPA recognizes that there may exist injections into USDW's that the Agency is unaware of, or that legally began during the period between the September 2, 1983, proposal and the effective date of today's regulations.

Owners and operators of such wells are encouraged to notify Patrick A. Crotty, Chief, Ground Water Section, Drinking Water Branch, EPA Region VIII, 1860 Lincoln St., Denver, Colorado 80295, as quickly as possible to determine the status of their particular operation. Region VIII proposes to accumulate information on these injection operations and to take such action as is appropriate. EPA will review any requests for exemption in accordance with §§ 144.7 and 146.4 and individually approve or deny the requests, as appropriate.

One commenter suggested that aquifer exemption criteria should be made more stringent for those areas of Colorado where there are few other sources of drinking water containing less than 3000 mg/l TDS. There is already substantial protection for high quality aquifers built into the aquifer exemption process. EPA does not intend to issue exemptions simply because they are requested, but



will carefully apply the provisions of Section 146.4.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III Wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressures measured at the wellhead. The formula uses a value of .733 pounds per square inch per foot of depth (psi/ft). For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.303 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3) notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to these comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that operators of such existing wells should be able to meet this requirement without significant change in current operating procedures.

As pointed out in the Introduction, operators who wish to inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II salt water disposal wells must apply for a permit in any case: the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State-specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on the injection pressure of enhanced recovery

and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require both Class II enhanced recovery and liquid hydrocarbon storage injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone, but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow operators of enhanced recovery wells who wish to operate at pressures higher than the specified limit to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate to use in establishing the field rules are:

1. **Instantaneous Shut In Pressure:** ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open, to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.
2. **Formation "breakdown pressure":** indicated values from data recorded prior to and during Squeeze Cementing(1), Acidizing and Acid-Fracturing(2),(3) jobs performed by appropriate service companies. These "breakdown pressure" values are

frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. Water (or other fluid) injection "Step-Rate"(3),(4),(5) type testing performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. Other reliable field tests or performance data which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone, i.e., that the confining zone(s) have not been breached.

In no case is the operator of a Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will neither endanger the safety of USDWs as provided for in § 144.12, nor fracture the confining zone as required in § 146.23(a)(1).

#### *Casing and Cementing*

The Agency is promulgating cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with § 144.28(e) and § 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements in § 147.304(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24, 1980, promulgation of 40 CFR Part 146, the Agency outlined requirements in § 146.22 (c), (d), and (e) which made it possible to relieve operators of wells in existing fields from the requirements specified in § 146.22(b), provided that the operator did not allow movement of fluids which could pose a significant risk to the health of persons.

The Agency believes that the requirements are appropriate for wells in Colorado when a workover is necessary to bring an existing well into



compliance with the requirements of 40 CFR 144.28(e) and 146.22. The requirements dictate that the Regional Administrator make a determination that the wells may not be in compliance with the above requirements. If such a determination is made, he may impose requirements consistent with those adopted here, impose others as appropriate, or he may require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone, as well as the quantity and quality of cement to be used. The purpose of the requirements is to insure that USDWs are effectively cemented off, that injection fluids are isolated in the injection zone, and that the cement used in these activities is of sufficient quantity and quality to accomplish these goals in the environment in which it is used.

In order to provide more specific requirements for casing and cementing of newly constructed or converted wells, a literature review was conducted to establish effective practices for casing and cementing. The literature included "Cementing" by Dwight K. Smith, Cementing coordinator, Halliburton Services, Society of Petroleum Engineers of AIME, 1971; "Cementing Handbook Including Casing Handling Procedures" by George O. Suman, Jr. and Richard C. Ellis, World Oil, 1977; "Technical Position Paper #WM 8102", Uranium Recovery Licensing Branch, U.S. Nuclear Regulatory Commission, December 1981; "An Introduction to the Technology of Subsurface Wastewater Injection" EPA 600/2-77-240, December 1977; and "Injection Well Construction Practices and Technology," prepared by Geraghty and Miller Inc., Booze, Allen and Hamilton, Inc., October 1982.

#### Area of Review

Two comments were received on the EPA's proposal to establish the area of review for Colorado UIC program activities at a fixed radius of one-quarter mile. One commenter agreed with the fixed radius approach and suggested that either one-quarter or one-half mile would be appropriate. The other suggested that the proposed one-quarter mile fixed radius should be reconsidered for the same reasons that EPA originally made the proposal—i.e., because of the variable or non-continuous geology of Colorado.

EPA is promulgating the one-quarter mile fixed radius as proposed and as promulgated previously in § 146.6. The area of review merely establishes the boundary of that area around a proposed injection facility within which

the applicant for a permit must identify the location of wells which penetrate the injection zone, and for certain Class II wells, identifying any additional wells affected by the operation pressure. The Administrator will approve or disapprove each application based upon a review of information available for defining the proposed injection operation, the geology of the area, and other activities in the area. Permits will be granted only when it is demonstrated that underground sources of drinking water will not be endangered.

#### Area of Notification

Colorado is one of those States where the rural character of the State makes it likely that notice in a newspaper will not reach those parties interested in proposed injection wells. Those provisions which were removed from § 144.31 for the reasons described elsewhere in this preamble, have, therefore, been added to § 147.305 of Subpart G. They require that notification be made to all landowners and tenants of land within one-quarter mile of the site. Thus, notice to adjacent landowners is assured. In urban areas, where such notice would be impractical, the Regional Administrator may waive the requirement.

#### Class V Injection Wells Used for the In-situ Recovery of Lignite, Coal, Tar Sands, and Oil Shale

Several commenters presented arguments or expressed opinions that those wells currently included in Class V, and used for the in-situ recovery of oil shale and coal, were inappropriately classified and should be regulated by permit rather than rule. Some suggested reclassifying these wells as Class III, while others recommended that specific requirements be developed or that preconstruction site testing and continuous monitoring of operations be required. One commenter disagreed with some of that testimony as presented at the public hearing and indicated that the proposed §§ 144.26 and 144.27 sufficiently protect drinking water from Class V injections.

The classification of these wells is not a subject of this rulemaking. Nevertheless, the substantial interest in this topic indicates the need for some clarification.

Subpart F of Part 146 establishes the criteria and standards applicable to Class V wells. Operators are required to notify the Regional Administrator of the existence of such wells within one year of the effective date of this program, and to provide required inventory information. Region VIII has been actively compiling an inventory of such

wells for several months. Within three years of the effective date of the program, EPA intends to assess the contamination potential of all Class V wells in the State and make recommendations for appropriate regulatory approaches and for remedial actions where appropriate. In the meantime, the Regional Administrator plans to use the provisions of § 144.25 to require permits for those Class V injection wells where the protection of underground sources of drinking water makes it mandatory that specific requirements, which are not contained in the rule, be applied to that injection operation. The Regional Administrator has determined that injection operations used for the in-situ recovery of lignite, coal, tar sands and oil shale are likely candidates for such added requirements and intends to notify operators that such wells will require permits. This will be done on a case-by-case basis in accordance with § 144.25.

#### SUBPART J—DISTRICT OF COLUMBIA

#### SUBPART DDD—AMERICAN SAMOA

#### SUBPART EEE—COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

#### SUBPART FFF—TRUST TERRITORY OF THE PACIFIC ISLANDS

These jurisdictions have not submitted a UIC program for any class of wells in the State or Territory. Therefore, EPA must propose a program for all classes of wells. Because EPA is not aware of any existing Class I, II, III, or IV wells in these States or Territories it is not promulgating any specific provisions for existing wells authorized by rule. Class V wells will be inventoried, but not permitting or other regulatory action beyond the requirements of 40 CFR Parts 144 and 146 are imposed at this time. EPA has determined that the minimum program requirements set forth in 40 CFR Parts 124, 144, and 146 are appropriate for these jurisdictions and will require all owners and operators to comply with these UIC regulations. Applicants who seek a Federal UIC permit in these jurisdictions should be aware that these jurisdictions may prohibit construction and operation of injection wells. As provided in Section 1423(c) of the SDWA, the Federal UIC program does not supersede any State or local prohibition against underground injections.

#### SUBPART N—IDAHO

Subpart N requires all owners and operators to comply with the UIC



regulations at 40 CFR Parts 124, 144, and 146. Because EPA was not aware of any Class I, II, III, or IV wells in Idaho, no supplemental regulations for these classes of wells were proposed. Class V wells will be regulated under 40 CFR Parts 124, 144 and 146.

No information was submitted during the public comment period regarding the existence of Class I, II, III, or IV wells. Therefore, the regulations promulgated today merely incorporate 40 CFR Parts 124, 144, and 146 in the UIC program for Idaho.

The State of Idaho is developing a program to assume primary enforcement responsibility over all classes of wells. If the State program is approved at some future date, the Federally administered program will be rescinded.

#### SUBPART P—INDIANA

Subpart P requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations, where discretion is allowed, in order to make the Indiana UIC program appropriate and amenable to the combination of historic practices and geology unique to Indiana.

#### Exempted Aquifers

In the proposal, EPA indicated that subsequent to promulgation of the UIC program, facilities which are injecting into USDWs will become illegal unless that aquifer or a portion is exempted.

Several commenters requested aquifer exemptions based on undocumented compliance with the criteria in 40 CFR 144.7. Because EPA is unable to properly evaluate these requests based on the information given, the Administrator believes it would be premature to grant or deny exemptions at this time.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III Wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressure measured at the wellhead. For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.653 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3) notwithstanding the results of the formula calculation.

The 0.8 psi/ft fracture gradient in the formula for Indiana was determined after reviewing Warner and Lehr (1977, EPA-600/277-240). This report suggests a value between 0.5 and 1.0 psi/ft of depth and suggests that Regional

experience be used as a criterion in establishing a limit.

Agency inquiry indicated that fracture gradients in Indiana range from 0.8 to 1.2 psi/ft. EPA is proposing a conservative fracture gradient of 0.8 psi/ft. Owners or operators may apply for and receive permission to operate at pressures greater than the pressure being proposed here for rule-authorized operators, by applying for a permit and demonstrating that the pressure described is consistent with requirements in 40 CFR Part 146.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on the injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced recovery injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in §§ 144.28 and 144.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone, but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow

operators who wish to operate at pressures higher than the specified limit to do so merely by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate use in establishing the field rules are:

1. **Instantaneous Shut In Pressure:** ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open, to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. **Formation "breakdown pressure":** indicated values from data recorded prior to and during Squeeze Cementing(1), Acidizing and Acid-Fracturing(2),(3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. **Water (or other fluid) injection "Step-Rate"(3),(4), (5) type testing** performed specifically to determine the "break down pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. **Other reliable field tests or performance data** which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone; i.e., that the confining zone(s) have not been breached.

In no case is the operator of a Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his



injection will neither endanger the safety of USDWs as provided for in § 144.12, nor fracture the confining zone as required in § 146.23(a)(1).

#### *Casing and Cementing*

The Agency is adopting cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with §§ 144.28(e) and 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements adopted today in § 147.754(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24, 1980, promulgation of Part 146, the Agency outlined requirements in § 146.22 (c), (d), and (e) which were intended to relieve operators of wells in existing fields from the requirements specified in § 146.22(b), provided that the operation will not allow movement of fluids which could pose a significant risk to the health of persons.

The Agency believes that these requirements are appropriate for wells in Indiana when a workover is necessary to bring an existing well into compliance with the requirements of 40 CFR 144.28(a) and 146.22. The requirements adopted here dictate that the Regional Administrator make a determination that the wells may not be in compliance with the above requirements. If such a determination is made, he may impose requirements consistent with those adopted here, impose other appropriate requirements, or require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone as well as the quantity and quality of cement to be used. The purpose of the requirements is to ensure that USDWs are effectively cemented off, that injection fluids are isolated in the injection zone, and the cement used in these activities is of a sufficient quantity and quality to accomplish these goals in the environment in which it is used.

#### *Area of Review*

EPA proposed that the area of review of an injection well be fixed at one quarter mile or other fixed distance, or on the basis of the Theis' equation. EPA also requested public comments regarding possible alternative approaches.

EPA received no new suggestions from the commenters. However, comments generally indicated

acceptance of the fixed distance area of review approach. EPA will promulgate the regulations accordingly.

#### *SUBPART Q—IOWA*

Subpart Q requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed, in order to make the Iowa UIC program appropriate and amenable to the combination of historic practices and geology unique to Iowa.

Because EPA is not aware of any existing Class I, II, III, or IV wells in Iowa, it is not promulgating any specific provisions for existing wells authorized by rule. Class V wells will be inventoried, but no permitting or other regulatory action is proposed at this time.

All new Class I, Class II, and Class III wells in Iowa are required to apply for permit prior to initiation of construction. However, applicants who seek a Federal UIC permit in Iowa should be aware that the State prohibits the disposal of any pollutant other than heat into wells. As provided in section 1423(c) of the SDWA, the Federal UIC program does not supersede any State or local prohibitions against underground injection.

#### *SUBPART S—COMMONWEALTH OF KENTUCKY*

Subpart S requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations specific to Kentucky, where discretion is allowed, in order to make the Kentucky UIC program appropriate and amenable to the combination of historic practices and geology unique to the Commonwealth.

#### *State Primacy*

Several oil and gas operators requested that the State implement the Class II Underground Injection Control (UIC) program in Kentucky or that EPA delay direct implementation until an acceptable Class II primacy application was submitted and approved. These commenters argued that the State possesses greater expertise in dealing with injection activities and can better respond to the unique needs of the regulated community. EPA recognizes that the UIC program was intended by Congress to be implemented by the States whenever possible. Kentucky, however, has not submitted an application for primary enforcement responsibility for the UIC program for any well class. Where States are

unwilling or unable to implement the UIC program, Congress requires EPA to conduct the program. Should the State, at some later date, choose to seek primacy for the UIC program, and if the State application is approved by EPA, the Federally administered program will be rescinded.

#### *Aquifer Exemptions*

Subsequent to promulgation of this program, facilities which are injecting into an underground source of drinking water cannot legally operate unless that aquifer or portion thereof is exempted. Owners or operators should determine whether their facilities are injecting into a USDW as defined in § 146.3. Should an owner or operator find that he is injecting into a USDW, he may request an exemption consistent with criteria and procedures in § 146.4.

The preamble to the September 2, 1983, Federal Register notice stated that EPA was unaware of any injections into a USDW and, therefore, did not propose to exempt any aquifers at that time. During the comment period several oil and gas operators and the Kentucky Oil and Gas Association noted that enhanced recovery injections may be occurring into USDWs and that exemptions may be necessary. EPA has contacted the commenters and has requested additional information. EPA will review these aquifer exemption requests when adequately documented. If the review supports the request, EPA will provide public notice and opportunity for hearing and, if appropriate, grant the requests.

*Maximum Injection Pressure:* Existing Class I, II (Salt Water Disposal) and III Wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressure measured at the wellhead. For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.903 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3) notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to these comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that operators of such existing wells should be able to meet this requirement without significant change in current operating procedures. As pointed out in the Introduction, operators who wish to



inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II salt water disposal wells must apply for a permit in any case; the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure: Existing Enhanced Recovery and Hydrocarbon Storage Wells.**

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State-specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on the injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require both Class II enhanced recovery and liquid hydrocarbon storage injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone but believes this to be appropriate when specifying a

number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow operators of enhanced recovery wells who wish to operate at pressures higher than the specified limit to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate to use in establishing the field rules are:

1. **Instantaneous Shut In Pressure: ISIP** is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open, to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. **Formation "breakdown pressure":** indicated values from data recorded prior to and during Squeeze Cementing(1), Acidizing and Acid-Fracturing(2),(3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. **Water (or other fluid) injection "Step-Rate" (3),(4),(5) type testing** performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. **Other reliable field tests or performance data** which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone, i.e., that the confining zone(s) have not been breached.

In no case is the operator of a Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will neither endanger the safety of USDWs as provided for in § 144.12, nor fracture the confining zone as required in § 146.23(a)(1).

**Casing and Cementing**

The Agency is adopting cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with §§ 144.28(e) and 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements adopted today in § 147.904(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24, 1980, promulgation of Part 146, the Agency outlined requirements in § 146.22 (c), (d), and (e) which were intended to relieve operators of wells in existing fields from the requirements specified in § 146.22(b), provided that the operation will not allow movement of fluids which could pose a significant risk to the health of persons.

The Agency believes that these requirements are appropriate for wells in Kentucky when a workover is necessary to bring an existing well into compliance with the requirements of 40 CFR 144.28(a) and § 146.22. The requirements adopted here dictate that the Regional Administrator make a determination that the wells may not be in compliance with the above requirements. If such a determination is made he may impose requirements consistent with those adopted here, impose other appropriate requirements or he may require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone as well as the quantity and quality of cement to be used. The purpose of the requirements is to ensure that USDWs are effectively cemented off, that injection fluids are isolated in the injection zone, and that the cement used in these activities is of a sufficient quantity and quality to accomplish these goals in the environment in which it is used.

**Area of Review**

The Agency is limiting the options for establishing the Area of Review for Class II wells to the minimum fixed radius as described in § 146.6(b). The Agency is adopting this approach due in



part to the potentially large number of wells involved, and the considerable delay in program implementation caused by processing requests based on many formulae.

#### SUBPART X—MICHIGAN

Subpart X requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed in order to make the Michigan UIC program appropriate and amenable to the combination of historic practices and geology unique to Michigan.

#### Aquifer Exemptions

EPA proposed that subsequent to promulgation of the UIC program, facilities which are injecting into USDWs cannot legally operate unless that aquifer or a portion of the aquifer is exempted. Several commenters requested aquifer exemptions based on undocumented compliance with the criteria in 40 CFR 144.7. Because EPA is unable to properly evaluate these requests based on the information given, it would be premature to grant or deny exemptions at this time. The commenter may submit documentation as to the location, extent and other features of the aquifers if they wish to pursue the exemption requests.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III Wells.

EPA is adopting, for EPA implemented programs, for Class I and III wells, the use of a simple formula that will enable injection pressures to be measured at the well head.

An appropriate fracture gradient for Michigan is 0.8 psi/ft, according to the Michigan Department of Natural Resources. This number is also near the minimum value suggested by Warner and Lehr and is, therefore, being proposed for use in Michigan. EPA recognizes that this may be a conservative figure for some areas, but, since operators may receive permission to operate at pressures greater than the pressure being proposed here by applying for a permit, the Agency believes the figure is consistent with the Safe Drinking Water Act, without being unduly restrictive to operators.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received several comments on the proposed approach for limiting injection pressure. Briefly, commenters stated that the values specified were too low and that no single injection pressure was

appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State specific preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced recovery injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone, but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow operators who wish to operate at pressures higher than the specified limit, to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA intends to use in establishing the field rules are:

1. Instantaneous Shut In Pressure: ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open, to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed

(recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. Formation "breakdown pressure": indicated values from data recorded prior to and during Squeeze Cementing (1), Acidizing and Acid-Fracturing (2), (3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. Water (or other fluid) injection "Step-Rate" (3), (4), (5) type testing performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. Other reliable field tests or performance data which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone, i.e., the confining zone(s) have not been breached.

In no case is the operator of Class II enhanced recovery injection well relieved of his ultimate responsibility to assure that his injection will not endanger the safety of USDWs as provided for in 144.12.

#### Casing and Cementing

The Agency is adopting cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with §§ 144.28(e) and 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements adopted today in § 147.1154(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24, 1980, promulgation of Part 146, the Agency outlined requirements in § 146.22 (c), (d), and (e) which were intended to relieve operators of wells in existing fields from the requirements specified in § 146.22(b), provided that



the operation will not allow movement of fluids which could pose a significant risk to the health of persons.

The Agency believes that these requirements are appropriate for wells in Michigan when a workover is necessary to bring an existing well into compliance with the requirements of 40 CFR 144.28(a) and 146.22. The requirements adopted here dictate that the Regional Administrator make a determination that the wells may not be in compliance with the above requirements. If such a determination is made he may impose requirements consistent with those adopted here, impose other appropriate requirements, or require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone as well as the quantity and quality of cement to be used. The purpose of the requirements is to ensure that USDWs are effectively cemented off, that injection fluids are isolated in the injection zone, and the cement used in these activities is of a sufficient quantity and quality to accomplish these goals in the environment in which it is used.

EPA proposed that operators who inject salt water for disposal purposes be required to install tubing and packers on these wells. Several comments received from consultants and solution mining operators expressed opposition to the requirement of a packer and tubing in injection wells extracting minerals.

Their concerns were based on the belief that Class III wells injecting dilute mineral solutions, instead of fresh water for mineral extraction, may be technically classified as salt water injection wells. They further noted that construction practices for these wells were in ways more stringent than the requirements proposed. EPA after examining Michigan laws and prevailing practices for the solution mining industry agrees and is clarifying the tubing and packer requirement to apply only to wells which inject fluids for disposal.

#### *Area of Review*

EPA proposed that the area of review of an injection well be fixed at one-quarter mile or other fixed distance, or on the basis of the Theis' equation. EPA also welcomed public comments regarding possible alternative approaches.

EPA received no new suggestions from the commenters. However, comments generally indicated favorable acceptance of the fixed distance area of

review approach. EPA will promulgate the regulation accordingly.

#### *SUBPART Y—MINNESOTA*

Subpart Y requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144 and 146. Because EPA was not aware of any Class I, II, III, or IV wells in Minnesota, no supplemental regulations for these classes of wells were proposed. Class V wells would be regulated under 40 CFR Parts 124, 144, and 146.

No information was submitted during the public comment period regarding the existence of Class I, II, III or IV wells. Therefore the regulations promulgated today merely incorporate 40 CFR Parts 124, 144 and 146 in the UIC program for Minnesota.

EPA will be proposing a ban on Class I, II, III and IV wells on Indian lands in Minnesota in the near future. Until the ban is promulgated the UIC program being promulgated today applies to both Indian and non-Indian lands in Minnesota.

#### *SUBPART AA—MISSOURI*

On September 2, 1983, EPA proposed to federally implement the UIC program in Missouri (48 FR 40116). A full discussion of all actions EPA proposed is given in that notice. Pertaining to Missouri, subpart AA requires all owners and operators to comply with the UIC regulations in 40 CFR Parts 124, 144, and 146. EPA is not aware of any existing Class I, III, or IV wells in Missouri and is, therefore, not promulgating any specific provisions for existing wells authorized by rule. Class V wells will be inventoried and assessed to determine what permitting or other regulatory action is needed to protect underground sources of drinking water. EPA received no comments pertaining to the proposed rulemaking for Missouri and is now taking final rulemaking action to implement the program.

The Safe Drinking Water Act requires EPA to prescribe an Underground Injection Control program for a State if the State has not submitted an application, or if the state program either has been disapproved or no longer meets the requirements of the Act. The UIC program is designed to prevent underground injection through wells which endanger drinking water sources. On December 2, 1983, EPA granted the State of Missouri primary enforcement authority to operate a UIC Class II well program. Missouri has not received enforcement authority for Class I, III, IV, and V wells. EPA intends to operate the program for injection wells other than Class II wells, at least until

such time as Missouri is granted primary enforcement authority over the remaining classes of wells.

#### *SUBPART BB—MONTANA*

Owners and operators are required to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this Subpart BB of 40 CFR Part 147 contains supplemental regulations where discretion is allowed in order to make the Montana UIC program appropriate to the historic practices and geology specific to the State of Montana. The UIC program being promulgated today applies to both Indian and non-Indian lands in Montana.

#### *Aquifer Exemptions*

EPA regulations allow the Administrator of EPA to exempt specific aquifers if the aquifer meets the criteria established in § 146.4.

The Agency proposed to exempt those portions of aquifers within one-quarter mile of existing Class II wells in Montana for the purpose of Class II injection activities only. A listing of such aquifers was prepared and made available for review at both the EPA Regional Office in Denver and the EPA Office in Helena, Montana, beginning on September 2, 1983. There were no requests made for review of that listing. Exemptions of those aquifers or portions of aquifers included on that list are approved today. All Class II to IV injection wells which are injecting into an underground source of drinking water in Montana, as defined at § 144.3, where such aquifer has not been exempted for that Class of well, will not be legal subsequent to promulgation of this program.

Class II enhanced recovery injection well owners wishing to exempt an entire field were asked to submit a justification for such exemption within 45 days of the proposal. One owner came forward with a request to exempt seven unitized operations but did not make that request until the 59th day. Nevertheless, EPA processed this exemption request in accordance with § 144.7.

EPA recognizes that there may exist injections to USDWs that the Agency is unaware of, or that legally began during the period beginning September 2, 1983, and the effective date of these regulations.

Owners and operators of such wells are encouraged to notify Patrick A. Crotty, Chief, Ground Water Section, Drinking Water Branch, EPA Region VIII, 1860 Lincoln St., Denver, Colorado 80295, as quickly as possible to determine the status of their particular



operation. Region VIII proposes to accumulate information on these injection operations and to take such action as is appropriate. EPA will review any requests for exemption in accordance with §§ 144.7 and 146.4 and individually approve or deny the requests, as appropriate.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III Wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressure measured at the wellhead. For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.1353 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3), notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that operators of such existing wells should be able to meet this requirement without significant change in current operating procedures. As pointed out in the Introduction, operators who wish to inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II salt water disposal wells must apply for a permit in any case; the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these state-specific preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced recovery injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on this data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow operators who wish to operate at pressures higher than the specified limit, to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate to use in establishing the field rules are:

1. Instantaneous Shut In Pressure: ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open to inject fluids into an established fracture system under dynamic conditions, if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.
2. Formation "breakdown pressure": indicated values from data recorded prior to and during Squeeze Cementing (2), Acidizing and Acid-Fracturing (2),

(3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gauge pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. Water (or other fluid) injection "Step-Rate" (3), (4), (5) type testing performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. Other reliable field tests or performance data which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone, i.e., the confining zone(s) have not been breached.

In no case is the operator of Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will not endanger the safety of USDWs as provided for in § 144.12.

#### *Casing and Cementing*

The Agency is promulgating cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with §§ 144.28(e) and 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements in § 147.1354(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24, 1980, promulgation of 40 CFR Part 146, the Agency outlined requirements in § 146.22 (d), (c), and (e) which were intended to relieve operators of wells in existing fields from the requirements specified in § 146.22(b), provided that the operator will not allow movement of fluids which could cause a significant risk to the health of persons.

The Agency believes that the requirements are appropriate for wells in Montana when a workover is necessary to bring an existing well into compliance with the requirements of 40



CFR 144.28(e) and 146.22. The requirements dictate that the Regional Administrator make a determination that the wells may not be in compliance with the above requirements. If such a determination is made he may impose requirements consistent with those, impose other appropriate requirements, or he may require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone, as well as the quantity and quality of cement to be used. The purpose of the requirements is to insure that USDWs are effectively cemented off, that injection fluids are isolated in the injection zone, and that the cement used in these activities is of sufficient quantity and quality to accomplish these goals in the environment in which it is used.

The rules recognize the geologic differences between the eastern and western regions of the State. The eastern region is generally uniform geologically. The regulations require an operator to run surface casing to the nearest major shale formation and circulate cement to the surface to seal off the overlying USDWs. If the surface casing failed to reach the underlying major shale formation, the owner or operator would be required to cement the long string of casing from the surface to the major shale formation. For instance, in the Miles City area, the geologic sections listed in order of increasing depth are as follows:

(a) Ft. Union Formation—interbedded clays, sandstones, coal (a major USDW with TDS ranges from 500 to 5,000 mg/liter).

(b) Hell Creek Formation—sandstone, shaley mudstones, coal (a USDW with TDS ranges from 500 to 1,100 mg/l).

(c) Fox Hill Sandstone—shaley sandstone (a major USDW considered as part of the Hell Creek).

(d) Bearpaw Shale—thick shale and bentonite beds; does not contain significant amounts of water.

(e) Judith River Formation—interbedded sandstones, siltstones and sandy shales with some lignite—a USDW near recharge areas but TDS can range up to 27,000 mg/l.

(f) Claggett Formation—thick shale with localized sandstone lenses and thick bentonite at the base.

(g) Eagle Sandstone—sandstones and shaley sandstones with some lignite (a USDW with TDS generally less than 1,500 mg/l).

(h) Other underlying formations.

Wells located in the Miles City area shall be cased and cemented from the surface at least 50 feet into the Bearpaw Shale, which is a thick section of clay

and shale underlying several major underground sources of drinking water.

For a well located in the Glasgow area, north of Miles City, the owner or operator is required to case and/or cement from the surface at least 50 feet into the Claggett formation, which is the first major shale formation below the Judith River formation which is the uppermost USDW in that area.

The western portion of the State is extremely complex geologically. The western portion has some intense faulting and overthrusting as well as some major folds. In addition, there are several intermountain basins, which are structures produced by faulting which have been filled in with unconsolidated and semi-consolidated material which are apparently saturated.

For the western portion of the State, EPA is proposing that cement be set from the surface through the lowermost USDW used for drinking water, or to a depth of 1,000 feet, whichever is greater. The Regional Administrator may authorize an owner or operator to cement to a point other than the lowermost USDW in use, if an owner or operator can demonstrate that the use of such construction will not adversely affect the injection activities to affect the USDW.

#### *Area of Notification*

Montana is one of those States where the rural character of the State makes it likely that notice in a newspaper will not reach those parties interested in proposed injection wells. Those provisions which were removed from § 144.31 for the reasons described elsewhere in this preamble, have, therefore, been added to § 147.1355 of Subpart BB. They require that notification be made to all landowners and tenants of land within one-quarter mile of the site. Thus, notice to adjacent landowners is assessed. In urban areas, where such notice would be impractical, the Regional Administrator may waive the requirement.

Also, in response to the Agency's specific request the Indian Tribes submit comments regarding which of the four options is most appropriate for Indian lands, the Fort Peck Tribal Council pointed out that their reservation lands were largely checkerboarded with fee land interspersed with Indian trust land. They suggested that these conditions could preclude notification of a landowner in an adjacent section and that such landowners might be affected by the proposed injection activity. They requested, therefore, that the one-quarter mile radius of notification be extended to one-half mile from the injection well.

In keeping with its proposal to solicit comments from affected Indian Tribes, EPA confirmed that the checkerboard patterns of land ownership are indeed characteristic of the Fort Peck Indian Reservation. In addition, similar reviews showed that such land ownership patterns are also characteristic of other Indian reservations in Montana.

It is in the interest of both EPA and operators to implement programs that are as consistent as possible within the boundaries of each State. It is upon this premise that the agency proposed to administer the same program for both Indian and non-Indian lands in EPA-administered States like Montana. The Agency has, therefore, amended § 147.1355(c) to Subpart BB to accommodate the concerns of the Indians and provide for notice to landowners within one-half mile of the exterior boundary of all Indian reservation lands in Montana.

#### *SUBPART CC—NEBRASKA*

Subpart CC requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed, in order to make the Nebraska UIC program appropriate and amenable to the combination of historic practices and geology unique to Nebraska.

A Class II program administered by the Nebraska Oil and Gas Commission has already been approved. Therefore, EPA is not proposing a Class II program.

Because EPA is not aware of any existing Class I, III, or IV wells in Nebraska, it is not proposing any specific provisions for existing wells authorized by rule. Class V wells will be inventoried within one year of promulgation of the program, but no permitting or other regulatory action beyond those in 40 CFR Parts 124, 144, and 146 is proposed at this time.

#### *SUBPART DD—NEVADA*

Subpart DD requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed in order to make the Nevada UIC program appropriate and amenable to the combination of historic practices and geology unique to Nevada.

#### *Exempted Aquifers*

The Agency proposed to exempt those portions of the Railroad Valley aquifer in Nye County, Nevada, which lie within one-quarter mile of existing Class II



wells, for the purpose of Class II injection activities only. Commenters stated that the entire Railroad Valley aquifer should not be exempted. EPA has clarified its intent by revising the final regulations to specify that only the proven oil-bearing portions of the Railroad Valley aquifer which are within one quarter mile of the existing Class II wells are exempted for Class II injection activities. All Class I through IV injection wells which are injecting into an underground source of drinking water in Nevada, as defined at § 144.3, where such an aquifer has not been exempted for that Class of well will become illegal subsequent to the promulgation of these regulations.

**Maximum Injection Pressure: Existing Class I, II (Salt Water Disposal) and III Wells.**

The Agency proposed to adopt a simple formula that would prescribe injection pressure measured at the wellhead. For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.1453 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3) notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to these comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that existing operators of such wells should be able to meet this requirement without significant change in current operating procedures. As pointed out in the Introduction, operators who wish to inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II salt water disposal wells must apply for a permit in any case; the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure: Existing Enhanced Recovery and Hydrocarbon Storage Wells.**

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low,

and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State specific preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require both Class II enhanced recovery and liquid hydrocarbon storage injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation-specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone, but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA will allow operators who wish to operate at pressures higher than the specified limit, to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate to use in establishing the field rules are:

1. Instantaneous Shut-In Pressure: ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open to inject fluids into an established fracture system under dynamic

conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. Formation "breakdown pressure": indicated values from data recorded prior to and during Squeeze Cementing(1), Acidizing and Acid-Fracturing(2),(3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gauge pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

In no case is the operator of Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will not endanger the safety of USDWs as provided for in § 144.12.

#### SUBPART HH—NEW YORK

Subpart HH requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations, where discretion is allowed, in order to make the New York UIC program appropriate and amenable to the combination of historic practices and geology unique to New York.

#### Aquifer Exemptions

The proposed § 147.1652 provided a listing of hydrocarbon producing aquifers which had total dissolved solids (TDS) of less than 10,000 mg/l to be exempted in accordance with Section 146.4. The list consisted of those oil-bearing formations which, due to many years of Class II enhanced recovery water flooding with fresh water, had experienced TDS content reductions from in excess of 10,000 mg/l to less than 10,000 mg/l, thereby qualifying them as USDWs. EPA has completed its detailed analysis of New York's oil-bearing aquifers and has found that fewer of these formations qualify as USDWs than originally was thought. As such, the Agency has revised the list of exempted aquifers in § 147.1652. Two commenters requested that the Glade Sand in Chautauqua County be added to the list of exempted aquifers. Since data available to EPA indicates that the formation has TDS levels in excess of 10,000 mg/l, it is not a USDW and there is, therefore, no need to grant an exemption. Such exemptions as are granted will apply only to Class II enhanced recovery wells because EPA



does not want to compromise the hydrocarbon producibility of these oil-bearing aquifers by making this exemption applicable to all classes of wells.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III Wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressure measured at the wellhead. For all rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.1653 has been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3), notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to these comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that existing operators of such wells should be able to meet this requirement without significant change in current operating procedures. As pointed out in the Introduction, operators who wish to inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II salt water disposal wells must apply for a permit in any case; the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State-specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised

approach for specifying limits on injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced recovery injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in § 144.28 and § 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The SIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone, but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA, in this rulemaking, allows operators, who wish to operate at pressures higher than the specified limit, to do so by merely demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate values for maximum injection pressure. Among the technical data that EPA intends to use in establishing the field rules are:

1. **Instantaneous Shut In Pressure:** ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.
2. **Formation "breakdown pressure":** Indicated values from data recorded prior to and during Squeeze Cementing (1), Acidizing and Acid-Fracturing (2), (3) jobs performed by appropriate service companies. These "breakdown pressure" values are

frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. **Water (or other fluid) injection "Step-Rate" (3), (4), (5) type testing** performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. **Other reliable field tests or performance data** which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator can exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone, i.e., the confining zone(s) have not been breached.

In no case is the operator of Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will not endanger the safety of USDWs as provided for in § 144.12.

#### *Casing and Cementing*

For any type of Class I well authorized by permit, the requirements in § 147.1655(a) reflect criteria designed to give the fullest level of protection to USDWs. An effective way to protect USDWs is to provide cemented surface casing from the surface to a point at least 50 feet below the base of the lowermost USDW. The Agency has required that Class I wells have long string casing over the total depth of the well because the generally toxic nature of the wastes and their generally caustic characteristics warrant such requirements. Long string casing is required to be cemented from the injection zone back at least 50 feet above the base of the surface casing or any intermediate strings of casing, where used. Any such intermediate strings of casing must be similarly cemented back 50 feet into the next largest casing. These requirements provide for a continuous cement barrier which will protect the casing from external corrosion. These requirements also represent a more cost-effective approach than cementing all of the annular space back to the surface, while



maintaining the appropriate environmental safeguards.

One commenter recommended that cementing requirements for new Class I wells should be set in the same manner as for new Class II wells, that is, by recirculating to the surface or by using no less than 120% of the calculated annular volume. EPA does not agree. The standard for Class I wells is to recirculate cement to the surface on surface casing, because the Agency believes this to be the most appropriate way to provide the protection to USDWs mandated by the Safe Drinking Water Act. The alternative standard for new Class II wells is based on the legislative mandate that EPA should not unduly impose economic hardship on the oil and gas industry and, because the hazards associated with Class II injection fluids are less, relative to those of Class I injection fluids.

The Agency is promulgating cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with §§ 144.28(e) and 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements in § 147.1654(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24, 1980, promulgation of 40 CFR Part 146, the Agency outlined requirements in § 146.22 (c), (d), and (e) which made it possible to relieve operators of wells in existing fields from the requirements specified in § 146.22(b), provided that the operator will not allow movement of fluids which could pose a significant risk to the health of persons.

The Agency believes that the requirements are appropriate for wells in New York when a workover is necessary to bring an existing well into compliance with the requirements of 40 CFR 144.28(e) and 146.22. The requirements dictate that the Regional Administrator make a determination that the wells may not be in compliance with these standards. If such a determination is made, he may impose requirements consistent with those imposed here, impose other appropriate requirements or he may require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone, as well as the quantity and quality of cement to be used. The purpose of the requirements is to insure that USDWs are effectively cemented off, that injection fluids are isolated in the

injection zone, and that the cement used in these activities is of sufficient quantity and quality to accomplish these goals in the environment in which it is used.

One commenter suggested that the Agency drop § 147.1655(b)(4), which specifies a long string casing for brine wells. They noted that § 146.22(b) contains no parallel distinction in construction requirements between Class II and enhanced recovery and brine disposal wells.

EPA does not agree that this paragraph should be stricken. Section 146.22(b) specifies that wells must be, " \* \* \* cased and cemented to prevent the movement of fluids into or between underground sources of drinking water." The Agency believes that a distinction between requirements for enhanced recovery wells and wells injecting brines is justified for several reasons. First, brine is corrosive and it may reduce the life of the tubular goods. Section 146.22 specifically instructs the Director to require that the casing and cementing be designed for the life expectancy of the well. Second, operators of enhanced recovery wells have an incentive to limit leaks or fluids; there is no comparable incentive in cases where brine is disposed. Accordingly, the Agency believes the requirements are justified, and is promulgating them as specified.

The same commenter noted that the reinjection of produced brine for enhanced oil recovery, whether produced on-site or off-site, could be mistakenly construed as a salt water disposal well subject to the more stringent casing and cementing requirements associated with brine disposal wells. The commenter requested that such wells be specifically exempted from the long string casing requirement.

EPA agrees that the reinjection of brines for enhanced recovery, regardless of the source of the brine, should not subject the operator to the long string casing requirement for brine disposal wells. EPA believes that the distinction is justified for reasons outlined above, and because, in an enhanced recovery operation, the injection pressure is relieved in the formation by the producing oil wells; whereas, in the case of a brine disposal well, the pressure is not relieved and the injected waste brine remains in the disposal formation. EPA, however, does not wish to encourage the injection of brines into oil producing formations which are not engaged in enhanced recovery operations. Therefore, it should be understood that this provision is limited solely to enhanced recovery operations.

#### Area of Review

One commenter submitted an alternate formula for calculating a zone of endangering influence. While § 146.6(a)(2) allows for the use of models other than the modified Theis equation, such use is not considered rulemaking. EPA will review the submitted formula at a later date. We do not consider it appropriate to review at this time, nor to include it as part of this action.

#### Indian Lands

EPA received comments from the Seneca Nation of Indians expressing concern over the proper jurisdiction of the UIC program on Indian Lands in New York State. The Agency has a long-standing position of special consideration of tribal interests when implementing any Federal program. In keeping with this position, EPA is negotiating a separate UIC program with the Seneca Nation of Indians.

The regulations governing injection wells located within the legal jurisdiction of the Seneca Nation of Indians will be proposed in the coming months. Until that time, regulations covering these injection wells are reserved. EPA is promulgating the requirements in today's rulemaking for all other Indian lands in New York.

#### Mechanical Integrity Testing

On February 3, 1983, EPA promulgated amendments to §§ 146.8 at 146.8(b)(3) to allow an alternate demonstration to the mechanical integrity tests specified. This alternative demonstration was developed, in part, in response to assertions from the oil industry that the existing tests were inappropriate for wells constructed with two-inch tubing as described below.

The alternative required that the owner or operator provide records of monitoring showing the absence of significant changes in the relationship between pressure and flow rates, inspect the annulus, and conduct ground-water monitoring to confirm the absence of significant fluid movement into a USDW. EPA believes this alternative is still appropriate. However, it has come to the attention of the Agency that for many operators in New York, establishing ground-water monitoring systems adequate to confirm the absence of fluid movement may be costly. Moreover, industry has contended that there are alternatives which would be as environmentally protective, but which would impose less burden on owners or operators. Consequently, EPA has considered the use of several other alternate mechanical tests for Class II enhanced



recovery wells in New York. In evaluating these alternate tests, EPA has taken the following historic and geologic characteristics into consideration.

(1) The historic and on-going industry-wide use of two-inch or less injection tubing has severely limited the availability of cost-effective down-hole instruments for either the emplacement of temporary plugs for pressure testing or well logging.

(2) Below the fractured saprolitic water table aquifers, bedrock fractures are not viable and experience has shown that the intervening shales down to oil producing sandstones are competent enough to support themselves in wells without long string casing. The historic and on-going industry-wide practice of completing enhanced oil recovery wells without long string casing has precluded the use of annulus pressure monitoring since there is no cased annulus.

(3) Monitoring records, which would establish a historic baseline of the pressure-flow rate relationship, are rarely existent.

(4) Cementing records on existing wells are generally not available.

The Agency initiated a study of alternate tests, and as a result, EPA plans to give interim approval to an alternative in a subsequent Federal Register notice. EPA intends to grant this approval for a two-year period to give the Agency the opportunity to evaluate the success and viability of the test after being conducted on a larger number of enhanced recovery wells.

#### SUBPART NN—PENNSYLVANIA

Subpart NN requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed in order to make the Pennsylvania UIC program appropriate and amenable to the combination of historic practices and geology unique to Pennsylvania.

#### Aquifer Exemptions

Section 147.1952 provides a listing of aquifers with total dissolved solids (TDS) levels of less than 10,000 mg/l that EPA is exempting in accordance with § 146.4.

These aquifers are not sources of drinking water according to EPA records. They cannot now and will not in the future serve as drinking water sources because they are hydrocarbon producing. The list of aquifers exempted consists of those oil-bearing formations which, due to many years of Class II enhanced recovery water flooding with fresh water, have experienced TDS

content reductions from in excess of 10,000 mg/l to less than 10,000 mg/l, thereby qualifying them as USDWs. This exemption will apply only to Class II enhanced recovery wells, because EPA does not want to compromise the hydrocarbon producibility of these oil-bearing aquifers by making this exemption applicable to all classes of wells.

A number of commenters have erroneously interpreted the list of exempted aquifers as shallow surface aquifers currently utilized for public water supply. One commenter expressed concern that the list should be complete at the outset of the program. Other commenters mistakenly thought that these exemptions represented a lower level of protection. The Agency believes that, with changes described below, the list of exempted aquifers is as complete and accurate as possible and certainly does not include any sources of drinking water.

This listing has been altered significantly, since the original proposal, to reflect the findings of both a survey of injection operators and a contracted study. Several oil producing formations and fields have been removed from the list (i.e., Washington-Taylorstown and Youngsville Fields) because current TDS concentrations were found to be in excess of 10,000 mg/l, therefore, not qualifying these fields as USDWs by definition and, hence, not requiring an exemption. Other fields (i.e., the Lewis Run and Morrison Run Fields) appear to have been added, but, in fact, this list has been rewritten to reflect the currently accepted method of naming and stratigraphically describing the formations which were listed in the September 2, 1983 proposal.

Detailed documentation of TDS levels, commercial producibility and maps describing and supporting these exemptions are available for inspection in the UIC program docket for Pennsylvania, maintained at EPA's Region III office in Philadelphia.

Additional aquifers may be considered for inclusion by EPA upon receipt of documenting information in accordance with § 144.7 and § 146.4.

**Maximum Injection Pressure:** Existing Class I, II (Salt Water Disposal) and III wells.

The Agency proposed to adopt a simple formula that would prescribe injection pressure measured at the wellhead. The formula uses a value of .733 psi/ft. For rule authorized wells (except enhanced recovery and hydrocarbon storage wells) that proposal has been adopted with clarification. Section 147.1953 has been reworded to make it clear that a well

injection must also comply with the nonfracturing provisions of § 144.28(f)(3) notwithstanding the results of the formula calculation. The Introduction to these State-specific preambles outlines the comments received on this topic, the Agency's response to these comments, and the justification for retaining the requirements as proposed. Information available to the Agency indicates that existing operators of such wells should be able to meet this requirement without significant change in current operating procedures. As pointed out in the Introduction, operators who wish to inject at higher pressures may receive authorization to do so by applying for a permit and demonstrating in that application that the increased operating pressures will not violate the performance standards in §§ 146.13, 146.23, and 146.33. If the Regional Administrator approves the application, the owner or operator may inject at the higher pressure. It should be noted that operators of Class I and III injection wells and operators of Class II salt water disposal wells must apply for a permit in any case; the former within 1 year of the effective date of the program, the latter within 4 years of that date.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State; appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced recovery injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and



4. Require owners or operators to comply with the performance standards in §§ 144.28 and 146.22 until such formation-specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone, but believes this to be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA in this rulemaking, allows that operators who wish to operate at pressures higher than the specified field rule, may do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146. EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA intends to use in establishing the field rules are:

1. Instantaneous Shut In Pressure: ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open, to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. Formation "breakdown pressure": indicated values from data recorded prior to and during Squeeze Cementing(1), Acidizing and Acid-Fracturing(2),(3), jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. Water (or other fluid) injection "Step-Rate"(3),(4),(5) type testing performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. Other reliable field tests or performance data which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of

the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator may exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection zone, i.e., the confining zone(s) have not been breached.

In no case is the operator of Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will not endanger the safety of USDWs as provided for in § 144.12.

EPA has received substantial fracture gradient data for much of the documentation provided by industry during the public comment period for fields in Pennsylvania. These data report average bottom hole fracture gradients which vary from 1.9 psi/foot to 1.23 psi/foot among five oil fields in Pennsylvania. Although these data point toward fracture gradients for the formula of approximately 1.2 psi/foot, there are several fields for which EPA has little or no data. Consequently, further data collection is necessary prior to the actual setting of pressure limitations for enhanced recovery injection wells in Pennsylvania.

#### *Casing and Cementing*

For any type of Class I well authorized by permit, the requirements in § 147.1955(a) reflect criteria designed to give the fullest level of protection to USDWs. An effective way to protect USDWs is to provide cemented surface casing from the surface to a point at least 50 feet below the base of the lowestmost USDW.

The Agency has required that Class I wells have long string casing over the total depth of the well because the generally toxic nature of the wastes and their generally caustic characteristics warrant such requirements. Long string casing is required to be cemented from the injection zone back at least 50 feet above the base of the surface casing or any intermediate strings of casing, where used. Any such intermediate strings of casing must be similarly cemented back 50 feet into the next largest casing. These requirements provide a continuous cement barrier which will protect the casing from external corrosion. These requirements also represent a more cost-effective approach than cementing all of the annular space back to the surface, while

maintaining the appropriate environmental safeguards.

One commenter recommended that cementing requirements for new Class I wells should be set in the same manner as for new Class II wells, that is, by recirculating to the surface or by using no less than 120% of the calculated annular volume. EPA does not agree. The standard for Class I wells is to recirculate cement to the surface on surface casing, because the Agency believes this to be the most appropriate way to provide the protection of USDWs mandated by the Safe Drinking Water Act. The alternative standard for new Class II wells is based on the legislative mandate that EPA should not unduly impose economic hardship on the oil and gas industry, and because the hazards associated with Class II injection fluids are less, relative to those of Class I injection fluids.

The Agency is promulgating casing and cementing requirements for existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule which may not be in compliance with § 144.28(e) and § 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements promulgated today in § 147.1954(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements.

The Agency believes that these requirements in § 147.1954(b) present methods which are appropriate for wells in Pennsylvania, when a workover is necessary to bring an existing well into compliance with the requirements of 40 CFR 144.28(e) and 146.22. The requirements promulgated today require that, if the Regional Administrator makes a determination that a well may not be in compliance, he may impose requirements consistent with those promulgated here, impose other appropriate requirements, or he may require the owner or operator to apply for a permit.

Several industry representatives operating in Pennsylvania have commented that § 147.1954(b) would require the retrofitting of existing wells that presently do not have surface casing cemented back to the surface; that such retrofitting would be economically burdensome if not technically impossible; and that it would be environmentally unnecessary as the historical practices in Pennsylvania have hitherto protected USDWs. Actually § 147.1954(b) does not automatically require the retrofitting of



any well, just because it does not have surface casing cemented to the surface. In fact, the only time the retrofit repair provisions are to be applied is if, and only if, the Regional Administrator determines that fluid movement is occurring into or between USDWs due to inadequate casing or cementing.

For new Class II wells authorized by permit, the requirements in § 147.1955(b) reflect a level of design necessary to provide sufficient protection to USDWs from injected fluids. An effective way to protect USDWs is to provide cemented surface casing all the way from the surface to a point well below the base of the lowermost USDW. The option of placing cement equal to a minimum of 120% of the calculated annular volume in lieu of recirculation to the surface (as required for Class I wells) is allowed due to the nature of the injected fluid and is considered adequate to protect USDWs.

One commenter suggested that § 147.1955(b)(4), which specifies a long string casing requirement for brine disposal wells, be stricken from the regulations, since § 146.22(b) contains no distinction in construction requirements between Class II enhanced recovery and brine disposal wells.

EPA does not agree that this paragraph should be stricken. Section 146.22(b) specifies that wells must be, " \* \* \* cased and cemented to prevent the movement of fluids into or between underground sources of drinking water." The Agency believes that a distinction between requirements for enhanced recovery wells and wells injecting brines is justified for several reasons. First, brine is corrosive and it may reduce the life of the tubular goods. Section 146.22 specifically instructs the Director to require that the casing and cementing be designed for the life expectancy of the well. Second, operators of enhanced recovery wells have an incentive to limit leaks or fluids; there is no comparable incentive in cases where brine is disposed. Accordingly, the Agency believes the requirements are justified and is promulgating them as specified.

One industry commenter noted that the reinjection of produced brine for enhanced oil recovery, whether produced on-site or off-site, could be mistakenly construed as a salt water disposal well subject to the more stringent casing and cementing requirements associated with brine disposal wells. The commenter requested that such wells be specifically exempted from the long string casing requirement.

EPA agrees that the reinjection of brines for enhanced recovery, regardless

of the source of the brine, should not subject the operator to the long string casing requirement for brine disposal wells. EPA believes that the distinction is justified for the reasons outlined above, and because, in an enhanced recovery operation, the injection pressure is relieved in the formation by the producing oil wells; whereas, in the case of a brine disposal well the pressure is not relieved, and the injected waste brine remains in the disposal formation. EPA, however, does not wish to encourage the injection of brines into oil producing formations which are not engaged in enhanced recovery operations.

For enhanced recovery wells a choice of tubing or long string casing is provided. Long string casing is preferable and is consistent with existing industry practice over much of the rest of the country. The option of injection tubing without long string casing is provided because of the highly competent nature of the rock, which comprises the confining strata in the oil and gas producing areas of the State.

For all the aforementioned well types, EPA has prescribed a basic level of protection for USDWs by setting the casing and cementing requirements specified above. Section 147.1955(c) does, however, provide relief for any owner or operator who cannot comply with the prescribed casing and cementing requirements for a particular well type. In such instances, the Regional Administrator may approve alternate casing and cementing provisions on a case-by-case basis in a permit, provided that similar levels of protection are afforded the USDW.

#### *Area of Review*

One commenter submitted an alternate formula for calculating a zone of endangering influence. While § 146.6(a)(2) allows for the use of models other than the modified Theis equation, such use is not considered rulemaking. EPA will review the submitted formula at a later date. We do not consider it appropriate to review at this time, not to include it as part of this action.

#### *Mechanical Integrity Testing*

On February 3, 1983, EPA promulgated amendments to § 146.8 at § 146.8(b)(3) to allow an alternate demonstration to the mechanical integrity tests specified. This alternate demonstration was developed, in part, in response to assertions from the oil industry that the existing tests were inappropriate for wells constructed with two-inch tubing as described below. The alternative required that the owner or operator provide records of monitoring showing

the absence of significant changes in the relationship between pressure and flow rates, inspect the annulus, and conduct ground-water monitoring to confirm the absence of significant fluid movement into a USDW. EPA believes this alternative is still appropriate. However, it has come to the attention of the Agency that for many operators in Pennsylvania, establishing ground-water monitoring systems adequate to confirm the absence of fluid movement may be costly. Moreover, industry has contended that there are alternatives which would be as environmentally protective, but which would impose less burden on owners or operators. Consequently, EPA has considered the use of several other mechanical tests for Class II enhanced recovery wells in Pennsylvania.

In evaluating these alternate tests, EPA has taken the following historic and geologic characteristics into consideration.

(1) The historic and on-going industry-wide use of two-inch or less injection tubing has severely limited the availability of cost-effective down-hole instruments for either the emplacement of temporary plugs for pressure testing or well logging.

(2) Below the fractured saprolitic water table aquifers, bedrock fractures are not viable, and experience has shown that the intervening shales down to oil producing sandstones are competent enough to support themselves in wells without long string casing. The historic and on-going industry-wide practice of completing enhanced oil recovery wells without long string casing has precluded the use of annulus pressure monitoring since there is no cased annulus.

(3) Monitoring records, which would establish a historic baseline of the pressure-flow rate relationship, are rarely existent.

(4) Cementing records on existing wells are generally not available.

The Agency initiated a study of alternate tests for these wells in Pennsylvania, and as a result EPA plans to give interim approval to an alternative in a subsequent Federal Register notice. EPA intends to grant this approval for a two-year period to give the Agency the opportunity to evaluate the success and viability of the test after being conducted on a larger number of enhanced recovery wells.

#### *SUBPART RR—STATE OF TENNESSEE*

Subpart RR requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and



146. In addition, this subpart contains regulations specific to Tennessee where discretion is allowed, in order to make the Tennessee UIC program appropriate and amenable to the combination of historic practices and geology unique to Tennessee.

#### State Primacy

Several operators requested that the State implement the Underground Injection Control (UIC) program in Tennessee or that EPA delay direct implementation until an acceptable primacy application was submitted and approved. These commenters argued that the State possesses greater expertise in dealing with injection activities and can better respond to the unique needs of the regulated community. EPA recognizes that the UIC program was intended by Congress to be implemented by the State whenever possible. Tennessee, however, has not submitted an application for primary enforcement responsibility for the UIC program for any well class. Where States are unwilling or unable to implement the UIC program, Congress requires EPA to conduct the program. Should the State, at some later date, choose to seek primacy for the UIC program, and if the State application is approved by EPA, the Federally administered program will be rescinded.

#### Aquifer Exemptions

Subsequent to promulgation of this program, facilities which are injecting into an underground source of drinking water will become illegal unless that aquifer or portion, thereof, is exempted. Owners or operators should determine whether their facilities are injecting into a USDW as defined in § 146.3. Should an owner or operator find that he is injecting into a USDW, he may request an exemption consistent with criteria and procedures in 40 CFR 146.4.

**Maximum injection pressure:** Existing Class I, II (Salt Water Disposal) and III Wells.

For the State of Tennessee, the Agency proposed to adopt a simple formula that would limit injection pressures measured at the wellhead. That proposal has been adopted for all rule authorized wells with a clarification. Sections 147.2153 and 147.2154 have been reworded to make it clear that a well injection must also comply with the nonfracturing provisions of § 144.28(f)(3), notwithstanding the results of the formula calculation. The Agency decided to adopt the maximum injection pressure formula as proposed for the following reasons:

- Only one comment was received during the public participation process which requested that rule authorized wells operate at maximum historically demonstrated values.
- A review of State monthly operating reports for the previous two years indicated that four chemical companies operated injection wells at pressures below the maximum rate allowed by the formula.
- The existing operators of such wells are able to meet the requirement without significant change in current operating procedures.
- No additional burden on the operators is anticipated.

**Maximum Injection Pressure:** Existing Enhanced Recovery and Hydrocarbon Storage Wells.

The Agency received more comments on the proposed approach for limiting injection pressure than any other provision. Briefly, commenters stated that the values specified were too low, and that no single injection pressure was appropriate for an entire State, appropriate pressures being a function of formation characteristics, not political boundaries. A more complete discussion of the comments received and the Agency's response to these comments can be found in the Introduction to these State-specific Preambles.

After a thorough review of the comments and other technical data, EPA has decided to promulgate a revised approach for specifying limits on injection pressure of enhanced recovery and hydrocarbon storage wells. The details of this approach are outlined below. EPA will:

1. Eliminate the proposed State-wide psi/ft fracture gradient values;
2. Require Class II enhanced injection well operators to provide definitive field or formation-specific fracture-pressure data within one year of the effective date of this program;
3. Develop and specify a field or formation-specific pressure gradient based on these data and other reliable data; and
4. Require owners or operators to comply with the performance standards in §§ 144.28 and 146.22 until such formation specific standards are developed.

EPA believes that the instantaneous shut-in pressure (ISIP) is an appropriate value on which to base the maximum injection pressure for a formation or field. The ISIP represents the minimum injection pressure necessary to propagate existing fractures. EPA realizes that this pressure is generally less than the pressure needed to fracture the confining zone but believes this to

be appropriate when specifying a number applicable to owners or operators authorized by rule for the life of the well. In addition, EPA in this rulemaking, allows operators who wish to operate at pressures higher than the specified limit, to do so by demonstrating to the Regional Administrator that such injection pressures are consistent with the appropriate performance standards in 40 CFR Parts 144 and 146.

EPA recognizes that there is a variety of information which may be used to establish the appropriate value for maximum injection pressures. Among the technical data that EPA believes appropriate to use in establishing the field rules are:

1. **Instantaneous Shut In Pressure:** ISIP is the pressure observed (recorded) at the moment the fracturing operations are discontinued. ISIP is that static pressure required to hold a fracture open to inject fluids into an established fracture system under dynamic conditions if there were no pipe and/or perforation frictional pressure losses influencing the observed (recorded) surface pressure. Appropriate ISIP data of this quality are preferred by the Agency and are often readily available.

2. **Formation "breakdown pressure":** Indicated values from data recorded prior to and during Squeeze Cementing(2), Acidizing and Acid-Fracturing(2),(3) jobs performed by appropriate service companies. These "breakdown pressure" values are frequently reported as the surface gage pressure which must, through appropriate engineering calculations, be modified to reflect the corresponding sand-face pressure at which the formation fracture occurs.

3. **Water (or other fluid) injection "Step-Rate"(3),(4),(5) type testing** performed specifically to determine the "breakdown pressure" of the injection zone prior to the initiation of the enhanced recovery project.

4. **Other reliable field tests or performance data** which the operator can demonstrate as accurately reflecting the actual sand-face fracture pressure of the injection formation may also be utilized to meet the requirement.

EPA does recognize that, in certain situations, an operator may purposely inject into an enhanced recovery formation at a pressure in excess of the known formation fracture pressure. In such cases, the operator can exceed the injection formation fracture pressure so long as he can demonstrate to the Regional Administrator that the injected fluids are contained within the injection



zone, i.e., the confining zone(s) have not been breached.

In no case is the operator of Class II enhanced recovery injection or hydrocarbon storage well relieved of his ultimate responsibility to assure that his injection will not endanger the safety of USDWs as provided for in § 144.12, nor fracture the confining zone as required in § 146.23(a)(1).

#### *Casing and Cementing*

The Agency is adopting cementing requirements for existing enhanced recovery and hydrocarbon storage wells which may not be in compliance with §§ 144.28(e) and 146.22. These sections require existing wells to be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The requirements in § 147.2154(b) recognize that it is at best difficult to bring existing wells into compliance with a new set of construction requirements. In the June 24 1980, promulgation of 40 CFR Part 146, the Agency outlined requirements in § 146.22 (c), (d), and (e) which made it possible to relieve operators of wells in existing fields from the requirements specified in § 146.22(b) provided that the operation would not allow movement of fluids which could pose a significant risk to the health of persons.

The agency believes that the requirements are appropriate for wells in Tennessee when workover is necessary to bring an existing well into compliance with the requirements of 40 CFR 144.28(e) and 146.22. The requirements dictate that the Regional Administrator make a determination that the wells may not be in compliance with the above requirements. If such a determination is made, he may impose requirements consistent with those adopted here, impose other appropriate requirements or he may require the owner or operator to apply for a permit. In general, these requirements identify the placement of cement relative to the USDWs and the injection zone as well as the quantity and quality of cement to be used. The purpose of the requirements is to insure that USDWs are effectively cemented off, that injection fluids are isolated in the injection zone, and that the cement used in these activities is of a sufficient quantity and quality to accomplish these goals in the environment in which it is used.

#### *Area of Review*

The Agency inadvertently failed to include in the September 2, 1983 Federal Register proposal the area of review requirements for the State of Tennessee.

EPA is establishing the area of review be a minimum fixed radius of one-quarter mile from the well head. The Theis equation and other formulas are not presented as alternatives.

Equations are valid only in those cases where a series of assumptions can be validated. It is the opinion of EPA that in the State of Tennessee, where formations are frequently fractured, folded or otherwise not continuous, the validation of the assumptions would present an unnecessary burden on the applicant and on EPA.

The adoption of a minimum fixed radius is consistent with Agency proposals in six other direct implementation States, where public hearings were held and no adverse comments received.

The Agency therefore is including this requirement as final rulemaking for the State of Tennessee.

#### *SUBPART VV—VIRGINIA*

Subpart VV requires all owners and operators to comply with the UIC regulations at 40 CFR Parts 124, 144, and 146. In addition, this subpart contains regulations that supplement the UIC regulations where discretion is allowed in order to make the Virginia UIC program appropriate and amenable to the combination of historic practices and geology unique to Virginia.

Because EPA is not aware of any existing Class I, II, III, or IV wells in Virginia, it is not adopting any specific provisions for existing wells authorized by rule. Class V wells will be adopted, but no permitting or other regulatory action is being proposed at this time.

The Commonwealth of Virginia, Department of Health has maintained that the Federal program is in conflict with some State requirements, and that the State, in fact, bans injection of hazardous waste. The State further contended that the existence of the Federal program could compromise the State's ability to implement a more stringent program. In response, EPA would like to point out that under the SDWA and Federal regulations, State programs are, in fact, permitted to operate side-by-side with EPA programs. Applicants must comply with the requirements of both programs, where necessary, before construction can commence. If the more stringent program has a ban on certain types of wells, that ban is effective against applicants permitted under the parallel program. Section 1423(c) provides that nothing "shall diminish any authority of a State or political subdivision to adopt or enforce any law or regulation respecting underground injection, but no such law or regulation shall relieve any

person of any requirement otherwise applicable under this title."

All new Class I, II, and III wells in Virginia are required to apply for permits prior to initiation of construction. However, applicants who seek a Federal UIC permit in Virginia should be aware that the State has a prohibition against underground injection of hazardous waste and that section 1423(c) of the Safe Drinking Water Act provides, as stated above, that "nothing in this title shall diminish any authority of a State or political subdivision to adopt or enforce any law or regulation respecting underground injection."

#### *References*

- (1) G.C. Howard and C.R. Fast, SPE-AIME Hydraulic Fracturing Monograph, Vol. 2 of the Henry L. Doherty Series, 1970, pp. 98-100, pp. 2-7.
- (2) Yuster and Calhoun, "Pressure Parting of Formations in Water Flood Operations", Oil Weekly, March 12 and 19, 1945.
- (3) John C. Calhoun, Fundamentals of Reservoir Engineering, University of Oklahoma Press, 1953, pp. 404-406.
- (4) M. Felsenthal and H.H. Ferrel, "Fracturing Gradients in Waterfloods of Low Permeability Partially Depleted Zones", Journal of Petroleum Technology, June 1971, pp. 727.
- (5) R.C. Earlougher, SPE-AIME Advances in Well Test Analysis Monograph No. 5, 1977, pp. 87.

#### *VII. Executive Order 12291*

In the proposal, EPA indicated that the Agency, in compliance with Executive Order 12291, had conducted a study to estimate the costs and burden that may be imposed on operators from the proposed regulations. The Agency had concluded that the proposal was not a major regulation since it did not impose more than \$100 million per year in costs to regulated industries. The Agency also concluded that there would be no adverse impact on the ability of U.S. based enterprises to compete with foreign-based enterprises in domestic or export markets. The proposal further indicated that the major effect of the regulations would simply make effective in particular States the UIC regulations promulgated as 40 CFR Parts 144, 145, and 146. The Agency now concludes, after additional study, that the results of these analyses are accurate and that these regulations will not impose more than \$100 million per year in costs on regulated industries.

#### *VIII. Regulatory Flexibility Act*

The proposed rule for Federally administered programs indicated that these requirements would not have a significant impact on a substantial



number of small entities. Burden estimates were prepared for small entities and published in the Preamble of the technical regulations. Based on analyses conducted in support of this promulgation, EPA finds that no requirements have been added that would impose additional burden on small operators.

#### IX. Paperwork Burden

The Agency published paperwork burden estimates in the proposed regulations concluding, on the basis of previous analyses, that these regulations could add 3,300 hours of paperwork burden to operators in those States in which EPA will administer the UIC program. The reporting requirements proposed in the published notice were submitted to and approved by OMB.

Since publication of the proposal, EPA has reviewed the analyses and concluded that the initial estimate is no longer appropriate; in part because the Agency has revised certain requirements, in part because EPA has

added a few new requirements, and in part because the Agency is considering burdens which are only now being implemented. As a result, the current estimated burden resulting from this rulemaking is approximately 102,140 hours (77,780 hours of which is the result of a one-time only collection of information which does not reoccur annually).

The information collection requirements contained in this rule have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* and have been assigned OMB control number 2040-0042.

#### List of Subjects

##### 40 CFR Part 124

Administrative practice and procedure, Air pollution control, Hazardous materials, Waste treatment and disposal, Water pollution control, Water supply, Indians—lands.

##### 40 CFR Part 144

Administrative practice and procedure, Reporting and recordkeeping requirements, Confidential business information, Water supply.

##### 40 CFR Part 146

Hazardous materials, Reporting and recordkeeping requirements, Waste treatment and disposal, Water supply.

##### 40 CFR Part 147

Administrative practice and procedure, Reporting and recordkeeping requirements, Intergovernmental relations, Penalties, Confidential business information, Water supply, Incorporation by reference.

Authority: Safe Drinking Water Act, 42 U.S.C. 300h.

Dated: March 27, 1984.

William D. Ruckelshaus,  
Administrator.

Editorial note.—This appendix will not appear in the code of Federal Regulations.

BILLING CODE 6560-50-M



## Appendix A—Underground Injection Control Permit Application

Form Approved. UMS No. 2040-0042. Expires 9-30-86

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------|
| Form<br><b>4</b><br>UIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | UNITED STATES ENVIRONMENTAL PROTECTION AGENCY<br><b>UNDERGROUND INJECTION CONTROL PERMIT APPLICATION</b><br>(Collected under the authority of the Safe Drinking Water Act, Sections 1421, 1422, 40 CFR 144) |                                                                                          | I. EPA ID NUMBER<br>_____ T/A C |                                                     |
| READ ATTACHED INSTRUCTIONS BEFORE STARTING FOR OFFICIAL USE ONLY                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| Application approved<br>mo day year                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                             | Date Received<br>mo day year                                                             |                                 | Permit/Well Number                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             |                                                                                          |                                 | Comments                                            |
| II. FACILITY NAME AND ADDRESS                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| Facility Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| Street Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| City                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                             | State                                                                                    | ZIP Code                        |                                                     |
| III. OWNER/OPERATOR AND ADDRESS                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| Owner/Operator Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| Street Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| City                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                             | State                                                                                    | ZIP Code                        |                                                     |
| IV. OWNERSHIP STATUS (Mark 'x')                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| <input type="checkbox"/> A. Federal <input type="checkbox"/> B. State <input type="checkbox"/> C. Private                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| <input type="checkbox"/> D. Public <input type="checkbox"/> E. Other (Explain)                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| V. SIC CODES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| VI. WELL STATUS (Mark 'x')                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| <input type="checkbox"/> A. Operating                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                             | Date Started<br>mo day year                                                              |                                 |                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             | <input type="checkbox"/> B. Modification/Conversion <input type="checkbox"/> C. Proposed |                                 |                                                     |
| VII. TYPE OF PERMIT REQUESTED (Mark 'x' and specify if required)                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| <input type="checkbox"/> A. Individual <input type="checkbox"/> B. Area                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                             | Number of Existing wells                                                                 | Number of Proposed wells        | Name(s) of field(s) or project(s)                   |
| VIII. CLASS AND TYPE OF WELL (see reverse)                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| A. Class(es)<br>(enter code(s))                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             | B. Type(s)<br>(enter code(s))                                                            |                                 | C. If class is "other" or type is code 'x,' explain |
| D. Number of wells per type (if area permit)                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| IX. LOCATION OF WELL(S) OR APPROXIMATE CENTER OF FIELD OR PROJECT                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| A. Latitude                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                             | B. Longitude                                                                             |                                 | Township and Range                                  |
| Deg Min Sec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Deg Min Sec                                                                                                                                                                                                 | Twsp Range Sec 1/4 Sec                                                                   | Feet from Line                  | Feet from Line                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| X. INDIAN LANDS (Mark 'x')                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| XI. ATTACHMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| (Complete the following questions on a separate sheet(s) and number accordingly; see instructions)<br>FOR CLASSES I, II, III (and other classes) complete and submit on separate sheet(s) Attachments A — U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application:                                                                                                                                    |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| XII. CERTIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| I certify under the 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 and imprisonment. (Ref. 40 CFR 144.32) |                                                                                                                                                                                                             |                                                                                          |                                 |                                                     |
| A. Name and Title (Type or Print)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                             |                                                                                          |                                 | B. Phone No. (Area Code and No.)                    |
| C. Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                          |                                 | D. Date Signed                                      |



**Well Class and Type Codes**

|                      |                                                                                   |
|----------------------|-----------------------------------------------------------------------------------|
| <b>Class I</b>       | Wells used to inject waste below the deepest underground source of drinking water |
| <b>Type "I"</b>      | Nonhazardous industrial disposal well                                             |
| <b>"M"</b>           | Nonhazardous municipal disposal well                                              |
| <b>"W"</b>           | Hazardous waste disposal well injecting below USDWs                               |
| <b>"X"</b>           | Other Class I wells (not included in Type "I," "M," or "W")                       |
| <b>Class II</b>      | Oil and gas production and storage related injection wells.                       |
| <b>Type "D"</b>      | Produced fluid disposal well                                                      |
| <b>"R"</b>           | Enhanced recovery well                                                            |
| <b>"H"</b>           | Hydrocarbon storage well (excluding natural gas)                                  |
| <b>"X"</b>           | Other Class II wells (not included in Type "D," "R," or "H")                      |
| <b>Class III</b>     | Special process injection wells.                                                  |
| <b>Type "G"</b>      | Solution mining well                                                              |
| <b>"S"</b>           | Sulfur mining well by Frasch process                                              |
| <b>"U"</b>           | Uranium mining well (excluding solution mining of conventional mines)             |
| <b>"X"</b>           | Other Class III wells (not included in Type "G," "S," or "U")                     |
| <b>Other Classes</b> | Wells not included in classes above.                                              |
|                      | Class V wells which may be permitted under §144.12                                |
|                      | Wells not currently classified as Class I, II, III, or V.                         |

**Attachments to Permit Application**

|               |                                                        |
|---------------|--------------------------------------------------------|
| <b>Class</b>  | <b>Attachments</b>                                     |
| I new well    | A, B, C, D, F, H — S, U                                |
| existing      | A, B, C, D, F, H — U                                   |
| II new well   | A, B, C, E, G, H, M, Q, R; optional — I, J, K, O, P, U |
| existing      | A, E, G, H, M, Q, R — U; optional — J, K, O, P, Q      |
| III new well  | A, B, C, D, F, H, I, J, K, M — S, U                    |
| existing      | A, B, C, D, F, H, J, K, M — U                          |
| Other Classes | To be specified by the permitting authority            |



**INSTRUCTIONS — Form 4 — Underground Injection Control (UIC) Permit Application**

Form 4 must be completed by all owners or operators of Class I, II, and III injection wells and others who may be directed to apply for a UIC permit by the Director.

**I. EPA I.D. NUMBER** — Fill in your EPA Identification Number. If you do not have a number, leave blank.

**II. FACILITY NAME AND ADDRESS** — Name of well, well field or company and address.

**III. OWNER/OPERATOR NAME AND ADDRESS** — Name and address of owner/operator of well or well field.

**IV. OWNERSHIP STATUS** — Mark the appropriate box to indicate the type of ownership.

**V. SIC CODES** — List at least one and no more than four Standard Industrial Classification (SIC) Codes that best describe the nature of the business in order of priority.

**VI. WELL STATUS** — Mark Box A if the well(s) were operating as injection wells on the effective date of the UIC Program for the State. Mark Box B if the well(s) existed on the effective date of the UIC Program for the State but were not utilized for injection. Box C should be marked if the application is for an underground injection project not constructed or not completed by the effective date of the UIC Program for the State.

**VII. TYPE OF PERMIT** — Mark "Individual" or "Area" to indicate the type of permit desired. Note that area permits are at the discretion of the Director and that wells covered by an area permit must be at one site, under the control of one person and do not inject hazardous waste. If an area permit is requested the number of wells to be included in the permit must be specified and the wells described and identified by location. If the area has a commonly used name, such as the "Jay Field," submit the name in the space provided. In the case of a project or field which crosses State lines, it may be possible to consider an area permit if EPA has jurisdiction in both States. Each such case will be considered individually, if the owner/operator elects to seek an area permit.

**VIII. CLASS AND TYPE OF WELL** — Enter in these two positions the Class and type of injection well for which a permit is requested. Use the most pertinent code selected from the list on the reverse side of Form 4. When selecting type X please explain in the space provided.

**IX. LOCATION OF WELL** — Enter the latitude and longitude of the existing or proposed well expressed in degrees, minutes, and seconds or the location by township, and range, and section, as required by 40 CFR 146. If an area permit is being requested, give the latitude and longitude of the approximate center of the area.

**X. INDIAN LANDS** — Place an "X" in the box if any part of the facility is located on Indian lands.

**XI. ATTACHMENTS** — Note that information requirements vary depending on the injection well class and status. Attachments for Class I, II, and III are described on pages 4 and 5 of this document and listed by Class on page 2. Place EPA ID number in the upper right hand corner of each page.

**XII. CERTIFICATION** — All permit applications (except Class II) must be signed by a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, and by a principal executive or ranking elected official for a public agency. For Class II, the person described above should sign, or a representative duly authorized in writing.



**INSTRUCTIONS — Attachments to Form 4**

Attachments to be submitted with permit application for Class I, II, III and other wells

- A. AREA OF REVIEW METHODS** — Give the methods and, if appropriate, the calculations used to determine the size of the area of review (fixed radius or equation). The area of review shall be a fixed radius of ¼ mile from the well bore unless the use of an equation is approved in advance by the Director.
- B. MAPS OF WELLS/AREA AND AREA OF REVIEW** — Submit a topographic map, extending one mile beyond the property boundaries, showing the injection well(s) or project area for which a permit is sought and the applicable area of review. The map must show all intake and discharge structures and all hazardous waste, treatment, storage, or disposal facilities. If the application is for an area permit, the map should show the distribution manifold (if applicable) applying injection fluid to all wells in the area, including all system monitoring points. Within the area of review, the map must show the following:

**Class I**

The number, or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, and other pertinent surface features, including residences and roads, and faults, if known or suspected. In addition, the map must identify those wells, springs, other surface water bodies, and drinking water wells located within one quarter mile of the facility property boundary. Only information of public record is required to be included on this map.

**Class II**

In addition to requirements for Class I, include pertinent information known to the applicant. This requirement does not apply to existing Class II wells.

**Class III**

In addition to requirements for Class I, include public water systems and pertinent information known to the applicant.

- C. CORRECTIVE ACTION PLAN AND WELL DATA** — Submit a tabulation of data reasonably available from public records or otherwise known to the applicant on all wells within the area of review, including those on the map required in B, which penetrate the proposed injection zone. Such data shall include the following:

**Class I**

A description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require. In the case of new injection wells, include the corrective action proposed to be taken by the applicant under 40 CFR 144.55.

**Class II**

In addition to requirements for Class I, in the case of Class II wells operating over the fracture pressure of the injection formation, all known wells within the area of review which penetrate formations affected by the increase in pressure. This requirement does not apply to existing Class II wells.

**Class III**

In addition to requirements for Class I, the corrective action proposed under 40 CFR 144.55 for all Class III wells.

- D. MAPS AND CROSS SECTIONS OF USDWs** — Submit maps and cross sections indicating the vertical limits of all underground indicating the vertical limits of all underground sources of drinking water within the area of review (both vertical and lateral limits for Class I), their position relative to the injection formation and the direction of water movement, where known, in every underground source of drinking water which may be affected by the proposed injection. (Does not apply to Class II wells.)
- E. NAME AND DEPTH OF USDWs (CLASS II)** — For Class II wells, submit geologic name, and depth to bottom of all underground sources of drinking water which may be affected by the injection.
- F. MAPS AND CROSS SECTIONS OF GEOLOGIC STRUCTURE OF AREA** — Submit maps and cross sections detailing the geologic structure of the local area (including the lithology of injection and confining intervals) and generalized maps and cross sections illustrating the regional geologic setting. (Does not apply to Class II wells.)
- G. GEOLOGICAL DATA ON INJECTION AND CONFINING ZONES (CLASS II)** — For Class II wells, submit appropriate geological data on the injection zone and confining zones including lithologic description, geological name, thickness, depth and fracture pressure.



- H. OPERATING DATA** — Submit the following proposed operating data for each well (including all those to be covered by area permits): (1) average and maximum daily rate and volume of the fluids to be injected; (2) average and maximum injection pressure; (3) nature of annulus fluid; (4) for Class I wells, source and analysis of the chemical, physical, radiological and biological characteristics, including density and corrosiveness, of injection fluids; (5) for Class II wells, source and analysis of the physical and chemical characteristics of the injection fluid; (6) for Class III wells, a qualitative analysis and ranges in concentrations of all constituents of injected fluids. If the information is proprietary, maximum concentrations only may be submitted, but all records must be retained.
- I. FORMATION TESTING PROGRAM** — Describe the proposed formation testing program. For Class I wells the program must be designed to obtain data on fluid pressure, temperature, fracture pressure, other physical, chemical, and radiological characteristics of the injection matrix and physical and chemical characteristics of the formation fluids.
- For Class II wells the testing program must be designed to obtain data on fluid pressure, estimated fracture pressure, physical and chemical characteristics of the injection zone. (Does not apply to existing Class II wells or projects.)
- For Class III wells the program must be designed to obtain data on fluid pressure, fracture pressure, and physical and chemical characteristics of the formation fluids if the formation is naturally water bearing. Only fracture pressure is required if the formation is not water bearing. (Does not apply to existing Class III wells or projects.)
- J. STIMULATION PROGRAM** — Outline any proposed stimulation program.
- K. INJECTION PROCEDURES** — Describe the proposed injection procedures including pump, surge, tank, etc.
- L. CONSTRUCTION PROCEDURES** — Discuss the construction procedures (according to §146.12 for Class I, §146.22 for Class II, and §146.32 for Class III) to be utilized. This should include details of the casing and cementing program, logging procedures, deviation checks, and the drilling, testing and coring programs, and proposed annulus fluid. (Request and submission of justifying data must be made to use an alternative to a packer for Class I.)
- M. CONSTRUCTION DETAILS** — Submit schematic or other appropriate drawings of the surface and subsurface construction details of the well.
- N. CHANGES IN INJECTED FLUID** — Discuss expected changes in pressure, native fluid displacement, and direction of movement of injected fluid. (Class III wells only.)
- O. PLANS FOR WELL FAILURES** — Outline contingency plans (proposed plans, if any, for Class II) to cope with all shut-ins or well failures, so as to prevent migration of fluids into any USDW.
- P. MONITORING PROGRAM** — Discuss the planned monitoring program. This should be thorough, including maps showing the number and location of monitoring wells as appropriate and a discussion of monitoring devices, sampling frequency, and parameters measured. If a manifold monitoring program is utilized, pursuant to §146.23(b)(5), describe the program and compare it to individual well monitoring.
- Q. PLUGGING AND ABANDONMENT PLAN** — Submit a plan for plugging and abandonment of the well including (1) describe the type, number, and placement (including the elevation of the top and bottom) of plugs to be used; (2) describe the type, grade, and quantity of cement to be used; and (3) describe the method to be used to place plugs, including the method used to place the well in a state of static equilibrium prior to placement of the plugs. Also for a Class III well that underlies or is in an exempted aquifer, demonstrate adequate protection of USDWs. Submit this information on EPA Form 7520-14, Plugging and Abandonment Plan.
- R. NECESSARY RESOURCES** — Submit evidence such as a surety bond or financial statement to verify that the resources necessary to close, plug or abandon the well are available.
- S. AQUIFER EXEMPTIONS** — If an aquifer exemption is requested, submit data necessary to demonstrate that the aquifer meets the following criteria: (1) does not serve as a source of drinking water; (2) cannot now and will not in the future serve as a source of drinking water; and (3) the TDS content of the ground water is more than 3,000 and less than 10,000 mg/l and is not reasonably expected to supply a public water system. Data to demonstrate that the aquifer is expected to be mineral or hydrocarbon producing, such as general description of the mining zone, analysis of the amenability of the mining zone to the proposed method, and time table for proposed development must also be included. For additional information on aquifer exemptions, see 40 CFR 144.7 and 146.04.
- T. EXISTING EPA PERMITS** — List program and permit number of any existing EPA permits, for example, NPDES, PSD, RCRA, etc.
- U. DESCRIPTION OF BUSINESS** — Give a brief description of the nature of the business.



40 CFR Part 144 is amended as follows:

## PART 144—UNDERGROUND INJECTION CONTROL PROGRAM

### Subpart A—General Provisions

1. In § 144.1 paragraph (a) is revised, existing paragraphs (b) through (e) are redesignated as (d) through (g), and new paragraphs (b) and (c) are added to read as follows:

#### § 144.1 Purpose and scope of Part 144.

(a) *Contents of Part 144.* The regulations in this Part set forth requirements for the Underground Injection Control (UIC) Program promulgated under Part C of the Safe Drinking Water Act (SDWA) (Pub. L. 95-523, as amended by Pub. L. 96502, 42 U.S.C. 300f et seq.) and, to the extent that they deal with hazardous waste, the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580 as amended by Pub. L. 95-609, Pub. L. 96-510, 42 U.S.C. 6901 et seq.).

(b) *Applicability.* (1) The regulations in this part establish minimum requirements for UIC programs. To the extent set forth in Part 145, each State must meet these requirements in order to obtain primary enforcement authority for the UIC program in that State.

(2) In addition to serving as minimum requirements for UIC programs, the regulations in this Part constitute a part of the UIC program for States listed in Part 147 to be administered directly by EPA.

(c) The information requirements located in the following sections have been cleared by the Office of Management and Budget: §§ 144.11, 144.28(c)(d)(i), 144.31, 14.33, 144.51(j)(m)(n), 144.52(a), 144.54, 144.55, 144.15, 144.23, 144.26, 144.27, 144.28(i)(k), 144.51(o), 146.52. The OMB clearance number is No. 2040-0042.

2. Section 144.13 is revised to read as follows:

#### § 144.13 Prohibition of class IV wells.

(a) The following are prohibited, except as provided in paragraph (c) of this section:

(1) The construction of any Class IV well.

(2) The operation or maintenance of any Class IV well not in operation prior to July 18, 1980.

(3) The operation or maintenance of any Class IV well that was in operation prior to July 18, 1980, after six months following the effective date of a UIC

program approved or promulgated for the state.

(4) Any increase in the amount of hazardous waste or change in the type of hazardous waste injected into a Class IV well.

(b) The owner or operator of a Class IV well shall comply with the requirements of § 144.14, and with the requirements of § 144.23 regarding closure of Class IV wells.

(c) Wells used to inject contaminated ground water that has been treated and is being reinjected into the same formation from which it was drawn are not prohibited by this section if such injection is approved by EPA pursuant to provisions for cleanup of releases under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. 9601-9657, or pursuant to requirements and provisions under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901-6987.

(d) Clarification. The following wells are not prohibited by this action:

(1) Wells used to inject hazardous waste into aquifers or portions thereof that have been exempted pursuant to § 146.4, if the exempted aquifer into which waste is injected underlies the lowermost formation containing a USDW. Such wells are Class I wells as specified in § 144.6(a)(1), and the owner or operator must comply with the requirements applicable to Class I wells.

(2) Wells used to inject hazardous waste where no USDW exists within one quarter mile of the well bore in any underground formation, provided that the Director determines that such injection is into a formation sufficiently isolated to ensure that injected fluids do not migrate from the injection zone. Such wells are Class I wells as specified in § 144.6(a)(1), and the owner or operator must comply with the requirements applicable to Class I wells.

### Subpart C—Authorization of Underground Injection by Rule

3. In § 144.21 paragraph (a)(3) and paragraph (c) are revised to read as follows:

#### § 144.21 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells.

(a) \* \* \*

(3)(i) For Class I and III wells:

(A) In approved State programs, five years after approval or promulgation of the UIC program unless a complete permit application is pending; or

(B) In EPA administered programs, one year after promulgation of the UIC

program unless a complete permit application is pending.

(ii) For Class II wells except enhanced recovery and hydrocarbon storage, five years after approval or promulgation of the UIC program unless a complete permit application is pending.

(c) *Requirements.* The owner or operator of a well authorized under this section shall comply with the applicable requirements of § 144.28 and Part 147 of this chapter no later than one year after authorization.

4. Section 144.22 is revised to read as follows:

#### § 144.22 Existing Class II enhanced recovery and hydrocarbon storage wells.

(a) Injection into existing Class II enhanced recovery and hydrocarbon storage wells is authorized for the life of the well or project.

(b) *Requirements.* The owner or operator of a well authorized under this section shall comply with the applicable requirements of § 144.28 and Part 147 of this chapter. Such owner or operator shall comply with the casing and cementing requirements no later than 3 years and other requirements no later than 1 year after authorization.

5. Section 144.23 is revised to read as follows:

#### § 144.23 Class IV Wells.

(a) Injection into existing Class IV wells is authorized for up to six months after approval or promulgation of the UIC Program. Such wells are subject to the requirements of § 144.13 and § 144.14(c).

(b) *Closure.* For EPA administered programs only.

(1) Prior to abandoning any Class IV well, the owner or operator shall plug or otherwise close the well in a manner acceptable to the Regional Administrator.

(2) Within 60 days after promulgation of the UIC program in the State, the owner or operator of a Class IV well shall submit to the Regional Administrator for approval a plan for plugging or otherwise closing and abandoning the well.

(3) The owner or operator of a Class IV well must notify the Regional Administrator of intent to abandon the well at least thirty days prior to abandonment.

6. In § 144.25 a new paragraph (a)(4) is added and paragraph (b) is revised to read as follows:

#### § 144.25 Requiring a permit.

(a) \* \* \*



(4) When the injection well is a Class I, II (except existing enhanced recovery and hydrocarbon storage) or III well, in accordance with a schedule established by the Director pursuant to § 144.31(c).

(b) For EPA administered programs, the Regional Administrator may require an owner or operator authorized by a rule to apply for an individual or area UIC permit under this paragraph only if the owner or operator has been notified in writing that a permit application is required. The injection activities are no longer authorized by rule upon the effective date of a permit or a permit denial, or upon failure by the owner or operator to submit an application in a timely manner as specified in the notice. The notice shall include: a brief statement of the reasons for requiring a permit; an application form; a statement setting a time for the owner or operator to file the application; and a statement of the consequences of denial or issuance of the permit, or failure to submit an application, as described in this paragraph.

7. In § 144.26, existing paragraphs (b) and (c) are redesignated as paragraphs (c) and (d), new paragraph (d) is revised, and new paragraph (b) is added to read as follows:

#### § 144.26 Inventory requirements.

(b) *Additional contents.* For EPA administered programs only, the owner or operator of a well listed in paragraph (b)(1) of this section shall provide the information listed in paragraph (b)(2) of this section.

(1) This section applies to the following wells:

- (i) Class II enhanced recovery wells;
- (ii) Class IV wells;
- (iii) The following Class V wells:
  - (A) Sand or other backfill wells [§ 146.5(e)(8)];
  - (B) Radioactive waste disposal wells [§ 146.5(e)(11)];
  - (C) Geothermal energy recovery wells [§ 146.5(e)(12)];
  - (D) Brine return flow wells [§ 146.5(e)(14)];
  - (E) Wells used in experimental technologies [§ 146.5(e)(15)];
  - (F) Municipal and industrial disposal wells other than Class I; and
  - (G) Any other Class V wells at the discretion of the Regional Administrator.

(2) The owner or operator of a well listed in paragraph (b)(1) shall provide a listing of all wells owned or operated setting forth the following information for each well. (A single description of wells at a single facility with

substantially the same characteristics is acceptable).

- (i) For Class II only, the field name(s);
- (ii) Location of each well or project given by Township, Range, Section, and Quarter-Section, or by latitude and longitude to the nearest second, according to the conventional practice in the State;
- (iii) Date of completion of each well;
- (iv) Identification and depth of the formation(s) into which each well is injecting;
- (v) Total depth of each well;
- (vi) Casing and cementing record, tubing size, and depth of packer;
- (vii) Nature of the injected fluids;
- (viii) Average and maximum injection pressure at the wellhead;
- (ix) Average and maximum injection rate; and
- (x) Date of the last mechanical integrity test, if any.

(d) *Deadlines.* (1) The owner or operator of an injection well shall submit inventory information no later than one year after the date of approval or effective date of the UIC program for the State. The Director need not require inventory information from any facility with interim status under RCRA.

(2) For EPA administered programs the information need not be submitted if a complete permit application is submitted within one year of the effective date of the UIC program. The owner or operator of Class IV well shall submit inventory information no later than 60 days after the effective date of the program.

8. A new § 144.27 is added to read as follows:

#### § 144.27 Requiring other information.

(a) For EPA administered programs only, in addition to the inventory requirements of § 144.26, the Regional Administrator may require the owner or operator of any well authorized by rule under this subpart to submit information as deemed necessary by the Regional Administrator to determine whether a well may be endangering an underground source of drinking water in violation of § 144.12 of this Part.

- (b) Such information requirements may include, but are not limited to:
  - (1) Performance of ground-water monitoring and the periodic submission of reports of such monitoring;
  - (2) An analysis of injected fluids, including periodic submission of such analyses; and
  - (3) A description of the geologic strata through and into which injection is taking place.

(c) Any request for information under this section shall be made in writing,

and include a brief statement of the reasons for requiring the information. An owner or operator shall submit the information within the time period(s) provided in the notice.

Any authorization by rule under this subpart automatically terminates for any owner or operator who fails to comply with a request for information under this section.

9. A new § 144.28 is added to read as follows:

#### § 144.28 Requirements for Class I, II, and III wells authorized by rule.

The following requirements apply to the owner or operator of a Class I, II, and III wells authorized by rule, as provided by §§ 144.21(c) and 144.22(b).

(a) The owner or operator shall comply with all applicable requirements of this Subpart and Subpart B of this part. Any noncompliance with these requirements constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action, except that the owner or operator need not comply with these requirements to the extent and for the duration such noncompliance is authorized by an emergency permit under § 144.34.

(b) *Twenty-four hour reporting.* The owner or operator shall report any noncompliance which may endanger health or the environment, including:

- (1) Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; or
- (2) Any noncompliance or malfunction of the injection system which may cause fluid migration into or between USDWs.

Any information shall be provided orally within 24 hours from the time the owner or operator becomes aware of the circumstances. A written submission shall also be provided within five days of the time the owner or operator becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(c) *Plugging and abandonment plan.* (1) The owner or operator shall prepare, maintain, and comply with a plan for plugging and abandonment of the well or project that meets the requirements of § 146.10 of this chapter and is acceptable to the Director. For purposes of this paragraph, temporary



intermittent cessation of injection operations is not abandonment

(2) For EPA administered programs:

(i) The owner or operator shall submit the plan, on a form provided by the Regional Administrator, no later than one year after the effective date of the UIC program in the state.

(ii) The owner or operator shall submit any proposed significant revision to the method of plugging reflected in the plan no later than the notice of plugging required by § 144.28(j)(2) (i.e., 45 days prior to plugging unless shorter notice is approved).

(iii) The plan shall include the following information:

(A) The nature and quantity and material to be used in plugging;

(B) The location and extent (by depth) of the plugs;

(C) Any proposed test or measurement to be made;

(D) The amount, size, and location (by depth) of casing to be left in the well;

(E) The method and location where casing is to be parted; and

(G) The estimated cost of plugging the well.

(iv) After a cessation of operations of two years the owner or operator shall plug and abandon the well in accordance with the plan unless he:

(A) Provides notice to the Regional Administrator;

(B) Describe actions or procedures, satisfactory to the Regional Administrator, that the owner or operator will take to ensure that the well will not endanger USDWs during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Regional Administrator.

(v) The owner or operator of any well that has been temporarily abandoned [ceased operations for more than two years and has met the requirements of paragraph (A) and (B) above] shall notify the Regional Administrator prior to resuming operation of the well.

(d) *Financial responsibility.* (1) The owner or operator of a Class I, II, or III well is required to maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner prescribed by the Director. The owner or operator shall show evidence of such financial responsibility to the Director by the submission of a surety bond, or other adequate assurance, such as a financial statement.

(2) For EPA administered programs the owner or operator shall submit such evidence no later than one year after the

effective date of the UIC program in the State.

(3) For EPA administered programs the Regional Administrator may require the owner or operator to submit a revised demonstration of financial responsibility if the Regional Administrator has reason to believe that the original demonstration is no longer adequate to cover the cost of closing, plugging and abandoning the well.

(4) For EPA administered programs the owner or operator of a well injecting hazardous waste must comply with the financial responsibility requirements of Subpart F of this part.

(e) *Casing and cementing requirements.* For enhanced recovery and hydrocarbon storage wells:

(1) The owner or operator shall case and cement the well to prevent movement of fluids into or between underground sources of drinking water. In determining and specifying casing and cementing requirements, the following factors shall be considered:

(i) Depth to the injection zone;

(ii) Depth to the bottom of all USDWs; and

(iii) Estimated maximum and average injection pressures.

(2) In addition, in determining and specifying casing and cementing requirements the Director may consider information on:

(i) Nature of formation fluids;

(ii) Lithology of injection and confining zones;

(iii) External pressure, internal pressure, and axial loading;

(iv) Hole size;

(v) Size and grade of all casing strings; and

(vi) Class of cement.

(3) The requirements in paragraphs (1) and (2) of this paragraph need not apply if:

(i) Regulatory controls for casing and cementing existed at the time of drilling of the well and the well is in compliance with those controls; and

(ii) Well injection will not result in the movement of fluids into an underground source of drinking water so as to create a significant risk to the health of persons.

(4) When a State did not have regulatory controls for casing and cementing prior to the time of the submission of the State program to the Administrator, the Director need not apply the casing and cementing requirements in paragraph (e)(1) of this section if he submits as a part of his application for primacy, an appropriate plan for casing and cementing of existing, newly converted, and newly drilled wells in existing fields, and the Administrator approves the plan.

(f) *Operating requirements.* (1)

Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.

(2) For Class I wells, unless an alternative to a packer has been approved under § 146.12(c) of this chapter, the owner or operator shall fill the annulus between the tubing and the long string of casings with a fluid approved by the Director and maintain a pressure, also approved by the Director, on the annulus. For EPA administered programs, the owner or operator of a Class I well completed with tubing and packer shall fill the annulus between tubing and casing with a noncorrosive fluid and maintain a positive pressure on the annulus. For other Class I wells, the owner or operator shall insure that the alternative completion method will reliably provide a comparable level of protection to underground sources of drinking water.

(3) *Injection pressure.*

(i) For Class I and III wells:

(A) Except during stimulation, the owner or operator shall not exceed an injection pressure at the wellhead which shall be calculated so as to assure that the pressure during injection does not initiate new fractures or propagate existing fractures in the injection zone; and

(B) The owner or operator shall not inject at a pressure which will initiate fractures in the confining zone or cause the movement of injection or formation fluids into an underground source of drinking water.

(ii) For Class II wells:

(A) The owner or operator shall not exceed a maximum injection pressure at the wellhead which shall be calculated so as to assure that the pressure during injection does not initiate new fractures or propagate existing fractures in the confining zone adjacent to the USDWs; and

(B) The owner or operator shall not inject at a pressure which will cause the movement of injection or formation fluids into an underground source of drinking water.

(g) *Monitoring requirements.* The owner or operator shall perform the monitoring as described in this paragraph. For EPA administered programs, monitoring of the nature of the injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR 136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Regional Administrator.

(1) The owner or operator of a Class I well shall:



(i) Analyze the nature of the injected fluids with sufficient frequency to yield data representative of their characteristics;

(ii) Install and use continuous recording devices to monitor injection pressure, flow rate and volume, and the pressure on the annulus between the tubing and the long string of casing;

(iii) Install and use monitoring wells within the area of review if required by the Director, to monitor any migration of fluids into and pressure in the underground sources of drinking water. The type, number and location of the wells, the parameters to be measured, and the frequency of monitoring must be approved by the Director.

(2) For Class II wells:

(i) The owner or operator shall monitor the nature of the injected fluids with sufficient frequency to yield data representative of their characteristics. For EPA administered programs, this frequency shall be at least once within the first year of the authorization and thereafter when changes are made to the fluid.

(ii) The owner or operator shall observe the injection pressure, flow rate, and cumulative volume at least with the following frequencies:

(A) Weekly for produced fluid disposal operations;

(B) Monthly for enhanced recovery operations;

(C) Daily during the injection of liquid hydrocarbons and injection for withdrawal of stored hydrocarbons; and

(D) Daily during the injection phase of cyclic steam operations.

(iii) The owner or operator shall record one observation of injection pressure, flow rate and cumulative volume at reasonable intervals no greater than thirty days.

(iv) For enhanced recovery and hydrocarbon storage wells:

(A) The owner or operator shall demonstrate mechanical integrity pursuant to § 146.8 of this chapter at least once every five years during the life of the injection well.

(B) For EPA administered programs, the Regional Administrator by written notice may require the owner or operator to comply with a schedule describing when such demonstrations shall be made.

(C) For EPA administered programs, the owner or operator of any well required to be tested for mechanical integrity shall notify the Regional Administrator at least 30 days prior to any required mechanical integrity test. The Regional Administrator may allow a shorter notification period if it would be sufficient to enable EPA to witness the mechanical integrity testing if it chose.

Notification may be in the form of a yearly or quarterly schedule of planned mechanical integrity tests, or it may be on an individual basis.

(v) The owner or operator of a hydrocarbon storage or enhanced recovery wells may monitor them by manifold monitoring on a field or project basis rather than on an individual well basis if such facilities consist of more than one injection well, operate with a common manifold, and provided the owner or operator demonstrates to the Director that manifold monitoring is comparable to individual well monitoring.

(3)(i) For Class III wells the owner or operator shall provide to the Director a qualitative analysis and ranges in concentrations of all constituents of injected fluids at least once within the first year of authorization and thereafter whenever the injection fluid is modified to the extent that the initial data are incorrect or incomplete. The owner or operator may request Federal confidentiality as specified in 40 CFR Part 2. If the information is proprietary the owner or operator may in lieu of the ranges in concentrations choose to submit maximum concentrations which shall not be exceeded. In such a case the owner or operator shall retain records of the undisclosed concentrations and provide them upon request to the Regional Administrator as part of any enforcement investigation; and

(ii) Monitor injection pressure and either flow rate or volume semi-monthly, or meter and record daily injected and produced fluid volumes as appropriate;

(iii) Monitor the fluid level in the injection zone semi-monthly, where appropriate;

(iv) All Class III wells may be monitored on a field or project basis rather than an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well, operating with a common manifold. Separate monitoring systems for each well are not required provided the owner or operator demonstrates to the Director that manifold monitoring is comparable to individual well monitoring.

(h) *Reporting requirements.* The owner or operator shall submit reports to the Director as follows:

(1) For Class I wells, quarterly reports on:

(i) The physical, chemical, and other relevant characteristics of the injection fluids;

(ii) Monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;

(iii) The results from ground-water monitoring wells prescribed in paragraph (g)(1)(iii) of this section;

(iv) The results of any test of the injection well conducted by the owner or operator during the reported quarter if required by the Director; and

(v) Any well work over performed during the reported quarter.

(2) For Class II wells:

(i) An annual report to the Director summarizing the results of all monitoring, as required in paragraph (g)(2) of this section. Such summary shall include monthly records of injected fluids, and any major changes in characteristics or sources of injected fluids. Previously submitted information may be included by reference.

(ii) The owner or operator of hydrocarbon storage and enhanced recovery projects may report on a field or project basis rather than on an individual well basis where manifold monitoring is used.

(3) For Class III wells:

(i) Quarterly reporting on all monitoring, as required in paragraph (g)(3) of this section;

(ii) Quarterly reporting of the results of any periodic tests required by the Director that are performed during the reported quarter;

(iii) Monitoring may be reported on a project or field basis rather than an individual well basis where manifold monitoring is used.

(i) *Retention of records.* The owner or operator shall retain records of all monitoring information, including the following:

(1) Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, and copies of all reports required by this section, for a period of at least three years from the date of the sample, measurement, or report. This period may be extended by request of the Director at any time; and

(2) The nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under § 144.52(1)(6). The Director may require the owner or operator to deliver the records to the Director at the conclusion of the retention period. For EPA administered programs, the owner or operator shall continue to retain the records after the three year retention period unless he delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

(j) *Notice of abandonment.* (1) The owner or operator shall notify the Director, according to a time period



required by the Director, before conversion or abandonment of the well.

(2) For EPA-administered programs, the owner or operator shall notify the Regional Administrator at least 45 days before plugging and abandonment. The Regional Administrator, at his discretion, may allow a shorter notice period.

(k) *Plugging and abandonment report.* For EPA-administered programs, within 60 days after plugging a well or at the time of the next quarterly report (whichever is less) the owner or operator shall submit a report to the Regional Administrator. If the quarterly report is due less than 15 days before completion of plugging, then the report shall be submitted within 60 days. The report shall be certified as accurate by the person who performed the plugging operation. Such report shall consist of either:

(1) A statement that the well was plugged in accordance with the plan previously submitted to the Regional Administrator; or

(2) Where actual plugging differed from the plan previously submitted, an updated version of the plan, on the form supplied by the Regional Administrator, specifying the different procedures used.

(l) *Change of ownership.* For EPA administered programs, the owner or operator shall notify the Regional Administrator of a transfer of ownership of the well within 30 days of such transfer.

(m) *Requirements for Class I Hazardous Waste Wells.* The owner or operator of any Class I well injecting hazardous waste shall comply with § 144.14(c). In addition, for EPA-administered programs the owner or operator shall properly dispose of, or decontaminate by removing all hazardous waste residues, all injection well equipment.

#### Subpart D—Authorization by Permit

10. In § 144.31 paragraph (c)(1) is revised and new paragraph (e)(9) is added to read as follows:

##### § 144.31 Application for a permit.

###### (c) Time to apply \* \* \*

(1) For existing wells, as expeditiously as practicable and in accordance with the schedule in any program description under § 145.23(f) or (for EPA administered programs) on a schedule established by the Regional Administrator, but no later than 4 years from the approval or promulgation of the UIC program, or as required under § 144.14(b) for wells injecting hazardous waste. For EPA administered programs

the owner or operator of Class I or III wells shall submit a complete permit application no later than 1 year after the effective date of the program.

###### (e) Information requirements \* \* \*

(9) For EPA-administered programs, the applicant shall identify and submit on a list with the permit application the names and addresses of all owners of record of land within one-quarter mile of the facility boundary. This requirement may be waived by the Regional Administrator where the site is located in a populous area and the Regional Administrator determines that the requirement would be impracticable.

11. In § 144.34 introductory text of paragraph (a) is revised to read:

##### § 144.34 Emergency permits.

(a) *Coverage.* Notwithstanding any other provision of this Part or Part 124, the Director may temporarily permit a specific underground injection if:

12. In § 144.51 paragraph (j)(2)(ii) is revised and new paragraphs (o) and (p) are added to read as follows:

##### § 144.51 Conditions applicable to all permits.

###### (j) Monitoring and records \* \* \*

###### (2) \* \* \*

(ii) The nature and composition of all injected fluids until three years after the completion of any plugging and abandonment procedures specified under § 144.52(a)(6). The Director may require the owner or operator to deliver the records to the Director at the conclusion of the retention period. For EPA administered programs, the owner or operator shall continue to retain the records after the three year retention period unless he delivers the records to the Regional Administrator or obtains written approval from the Regional Administrator to discard the records.

(o) *Plugging and abandonment report.* For EPA-administered programs, within 60 days after plugging a well or at the time of the next quarterly report (whichever is less) the owner or operator shall submit a report to the Regional Administrator. If the quarterly report is due less than 15 days before completion of plugging, then the report shall be submitted within 60 days. The report shall be certified as accurate by the person who performed the plugging operation. Such report shall consist of either:

(1) A statement that the well was plugged in accordance with the plan

previously submitted to the Regional Administrator; or

(2) Where actual plugging differed from the plan previously submitted, and updated version of the plan on the form supplied by the regional administrator, specifying the differences.

(p) *Mechanical integrity demonstrations.* For EPA administered programs, the Regional Administrator by written notice may require the owner or operator to comply with a schedule describing when such demonstrations shall be made.

13. In § 144.52 paragraphs (a)(5), (a)(6), and (a)(7) are revised to read as follows:

##### § 144.52 Establishing permit conditions.

###### (a) \* \* \*

(5) Monitoring and reporting requirements as set forth in 40 CFR Part 146. The permittee shall be required to identify types of tests and methods used to generate the monitoring data. For EPA administered programs, monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR 136.3 or in Appendix III of 40 CFR Part 261 or in certain circumstances by other methods that have been approved by the Regional Administrator.

(6) After a cessation of operations of two years the owner or operator shall plug and abandon the well in accordance with the plan unless he:

(i) Provides notice to the Regional Administrator;

(ii) Describes actions or procedures, satisfactory to the Regional Administrator, that the owner or operator will take to ensure that the well will not endanger USDWs during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Regional Administrator.

(7) *Financial responsibility.* The permittee is required to maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner prescribed by the Director. The permittee shall show evidence of such financial responsibility to the Director by the submission of a surety bond, or other adequate assurance, such as financial statements or other materials acceptable to the Director. For EPA administered programs, the Regional Administrator may on a periodic basis require the holder of a lifetime permit to submit an estimate of the resources needed to plug and abandon the well revised to reflect inflation of such costs,



and a revised demonstration of financial responsibility if necessary. The owner or operator of a well injecting hazardous waste must comply with the financial responsibility requirements of Subpart F of this part.

14. A new Subpart F consisting of §§ 144.60-144.70 is added as follows:

**Subpart F—Financial responsibility: Class I hazardous waste injection wells**

Sec.

- 144.60 Applicability.
- 144.61 Definitions of terms as used in this Subpart.
- 144.62 Cost estimate for plugging and abandonment.
- 144.63 Financial assurance for plugging and abandonment.
- 144.64 Incapacity of owners or operators, guarantors, or financial institutions.
- 144.65 Use of State-required mechanisms.
- 144.66 State assumption of responsibility.
- 144.70 Wording of the instruments.

Authority: Pub. L. 93-523, as amended by Pub. L. 95-190, Pub. L. 96-63 and Pub. L. 96-502, 42 U.S.C. 300f *et seq.*

**Subpart F—Financial Responsibility: Class I hazardous Waste Injection Wells**

**§ 144.60 Applicability.**

(a) The requirements of §§ 144.62, 144.63, and 144.70 apply to owners and operators of all existing and new Class I Hazardous waste injection wells, except as provided otherwise in this section.

**§ 144.61 Definitions of terms as used in this Subpart.**

(a) "Plugging and abandonment plan" means the plan for plugging and abandonment prepared in accordance with the requirements of § 144.28 and § 144.51.

(b) "Current plugging cost estimate" means the most recent of the estimates prepared in accordance with § 144.62(a), (b) and (c).

(c) "Parent corporation" means a corporation which directly owns at least 50 percent of the voting stock of the corporation which is the injection well owner or operator; the latter corporation is deemed a "subsidiary" of the parent corporation.

(d) The following terms are used in the specifications for the financial test for plugging and abandonment. The definitions are intended to represent the common meanings of the terms as they are generally used by the business community.

"Assets" means all existing and all probable future economic benefits obtained or controlled by a particular entity.

"Current assets" means cash or other assets or resources commonly identified as those which are reasonably expected

to be realized in cash or sold or consumed during the normal operating cycle of the business.

"Current liabilities" means obligations whose liquidation is reasonably expected to require the use of existing resources properly classifiable as current assets or the creation of other current liabilities.

"Independently audited" refers to an audit performed by an independent certified public accountant in accordance with generally accepted auditing standards.

"Liabilities" means probable future sacrifices of economic benefits arising from present obligations to transfer assets or provide services to other entities in the future as a result of past transactions or events.

"Net working capital" means current assets minus current liabilities.

"Net worth" means total assets minus total liabilities and is equivalent to owner's equity.

"Tangible net worth" means the tangible assets that remain after deducting liabilities; such assets would not include intangibles such as goodwill and rights to patents or royalties.

**§ 144.62 Cost estimate for plugging and abandonment.**

(a) The owner or operator must prepare a written estimate, in current dollars, of the cost of plugging the injection well in accordance with the plugging and abandonment plan as specified in §§ 144.28 and 144.51. The plugging and abandonment cost estimate must equal the cost of plugging and abandonment at the point in the facility's operating life when the extent and manner of its operation would making plugging and abandonment the most expensive, as indicated by its plugging and abandonment plan.

(b) The owner or operator must adjust the plugging and abandonment cost estimate for inflation within 30 days after each anniversary of the date on which the first plugging and abandonment cost estimate was prepared. The adjustment must be made as specified in paragraphs (b)(i) and (b)(ii) of this section, using an inflation factor derived from the annual Oil and Gas Field Equipment Cost Index. The inflation factor is the result of dividing the latest published annual Index by the Index for the previous year.

(i) The first adjustment is made by multiplying the plugging and abandonment cost estimate by the inflation factor. The result is the adjusted plugging and abandonment cost estimate.

(ii) Subsequent adjustments are made by multiplying the latest adjusted

plugging and abandonment cost estimate by the latest inflation factor.

(c) The owner or operator must revise the plugging and abandonment cost estimate whenever a change in the plugging and abandonment plan increases the cost of plugging and abandonment. The revised plugging and abandonment cost estimate must be adjusted for inflation as specified in § 144.62(b).

(d) The owner or operator must keep the following at the facility during the operating life of the facility: the latest plugging and abandonment cost estimate prepared in accordance with § 144.62 (a) and (c) and, when this estimate has been adjusted in accordance with § 144.62(b), the latest adjusted plugging and abandonment cost estimate.

**§ 144.63 Financial assurance for plugging and abandonment.**

An owner or operator of each facility must establish financial assurance for the plugging and abandonment of each existing and new Class I hazardous waste injection well. He must choose from the options as specified in paragraphs (a) through (f) of this section.

**(a) Plugging and abandonment trust fund.**

(1) An owner or operator may satisfy the requirements of this section by establishing a plugging and abandonment trust fund which conforms to the requirements of this paragraph and submitting an originally signed duplicate of the trust agreement to the Regional Administrator. An owner or operator of a Class I well injecting hazardous waste must submit the originally signed duplicate of the trust agreement to the Regional Administrator with the permit application or for approval to operate under rule. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(2) The wording of the trust agreement must be identical to the wording specified in § 144.70(a)(1), and the trust agreement must be accompanied by a formal certification of acknowledgment (for example, see § 144.70(a)(2)). Schedule A of the trust agreement must be updated within 60 days after a change in the amount of the current plugging and abandonment cost estimate covered by the agreement.

(3) Payments into the trust fund must be made annually by the owner or operator over the term of the initial permit or over the remaining operating life of the injection well as estimated in the plugging and abandonment plan,



whichever period is shorter; this period is hereafter referred to as the "pay-in period." The payments into the plugging and abandonment trust fund must be made as follows:

(i) For a new well, the first payment must be made before the initial injection of hazardous waste. A receipt from the trustee for this payment must be submitted by the owner or operator to the Regional Administrator before this initial injection of hazardous waste. The first payment must be at least equal to the current plugging and abandonment cost estimate, except as provided in § 144.70(g), divided by the number of years in the pay-in period. Subsequent payments must be made no later than 30 days after each anniversary date of the first payment. The amount of each subsequent payment must be determined by this formula:

$$\text{Next payment} = \frac{\text{PE} - \text{CV}}{Y}$$

where PE is the current plugging and abandonment cost estimate, CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(ii) If an owner or operator establishes a trust fund as specified in § 144.63(a) of this chapter, and the value of that trust fund is less than the current plugging and abandonment cost estimate when a permit is awarded for the injection well, the amount of the current plugging and abandonment cost estimate still to be paid into the trust fund must be paid in over the pay-in period as defined in paragraph (a)(3) of this section. Payments must continue to be made no later than 30 days after each anniversary date of the first payment made pursuant to Part 144 of this chapter. The amount of each payment must be determined by this formula:

$$\text{Next payment} = \frac{\text{PE} - \text{CV}}{Y}$$

where PE is the current plugging and abandonment cost estimate, CV is the current value of the trust fund, and Y is the number of years remaining in the pay-in period.

(4) The owner or operator may accelerate payments into the trust fund or he may deposit the full amount of the current plugging and abandonment cost estimate at the time the fund is established. However, he must maintain the value of the fund at no less than the value that the fund would have if annual

payments were made as specified in paragraph (a)(3) of this section.

(5) If the owner or operator establishes a plugging and abandonment trust fund after having used one or more alternate mechanisms specified in this section or in § 144.63 of this chapter, his first payment must be in at least the amount that the fund would contain if the trust fund were established initially and annual payments made according to specifications of this paragraph.

(6) After the pay-in period is completed, whenever the current plugging and abandonment cost estimate changes, the owner or operator must compare the new estimate with the trustee's most recent annual valuation of the trust fund. If the value of the fund is less than the amount of the new estimate, the owner or operator, within 60 days after the change in the cost estimate, must either deposit an amount into the fund so that its value after this deposit at least equals the amount of the current plugging and abandonment cost estimate, or obtain other financial assurance as specified in this section to cover the difference.

(7) If the value of the trust fund is greater than the total amount of the current plugging and abandonment cost estimate, the owner or operator may submit a written request to the Regional Administrator for release of the amount in excess of the current plugging and abandonment cost estimate.

(8) If an owner or operator substitutes other financial assurance as specified in this section for all or part of the trust fund, he may submit a written request to the Regional Administrator for release of the amount in excess of the current plugging and abandonment cost estimate covered by the trust fund.

(9) Within 60 days after receiving a request from the owner or operator for release of funds as specified in paragraphs (a)(7) or (8) of this section, the Regional Administrator will instruct the trustee to release to the owner or operator such funds as the Regional Administrator specifies in writing.

(10) After beginning final plugging and abandonment, an owner or operator or any other person authorized to perform plugging and abandonment may request reimbursement for plugging and abandonment expenditures by submitting itemized bills to the Regional Administrator. Within 60 days after receiving bills for plugging and abandonment activities, the Regional Administrator will determine whether the plugging and abandonment expenditures are in accordance with the plugging and abandonment plan or otherwise justified, and if so, he will instruct the trustee to make

reimbursement in such amounts as the Regional Administrator specifies in writing. If the Regional Administrator has reason to believe that the cost of plugging and abandonment will be significantly greater than the value of the trust fund, he may withhold reimbursement of such amounts as he deems prudent until he determines, in accordance with § 144.63(i), that the owner or operator is no longer required to maintain financial assurance for plugging and abandonment.

(11) The Regional Administrator will agree to termination of the trust when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The Regional Administrator releases the owner or operator from the requirements of this section in accordance with § 144.63(i).

(b) *Surety bond guaranteeing payment into a plugging and abandonment trust fund.* (1) An owner or operator must satisfy the requirements of this section by obtaining a surety bond which conforms to the requirements of this paragraph and submitting the bond to the Regional Administrator with the application for a permit or for approval to operate under rule. The bond must be effective before the initial injection of hazardous waste. The surety company issuing the trust must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The wording of the surety bond must be identical to the wording in § 144.70(b).

(3) The owner or operator who uses a surety bond to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all payments made thereunder will be deposited by the surety directly into the standby trust fund in accordance with instructions from the Regional Administrator. This standby trust fund must meet the requirements specified in § 144.63(a), except that:

(i) An originally signed duplicate of the trust agreement must be submitted to the Regional Administrator with the surety bond; and

(ii) Until the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these requirements:

(A) Payments into the trust fund as specified in § 144.63(a);

(B) Updating of Schedule A of the trust agreement [see § 144.70(a)] to show current plugging and abandonment cost estimates;



(C) Annual valuations as required by the trust agreement; and

(D) Notices of nonpayment as required by the trust agreement.

(4) The bond must guarantee that the owner or operator will:

(i) Fund the standby trust fund in an amount equal to the penal sum of the bond before beginning of plugging and abandonment of the injection well; or

(ii) Fund the standby trust fund in an amount equal to the penal sum within 15 days after an order to begin plugging and abandonment is issued by the Regional Administrator or a U.S. district court or other court of competent jurisdiction; or

(iii) Provide alternate financial assurance as specified in this section, and obtain the Regional Administrator's written approval of the assurance provided, within 90 days after receipt by both the owner or operator and the Regional Administrator of a notice of cancellation of the bond from the surety.

(5) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.

(6) The penal sum of the bond must be in amount at least equal to the current plugging and abandonment cost estimate, except as provided in § 144.63(g).

(7) Whenever the current plugging and abandonment cost estimate increases to an amount greater than the penal sum, the owner or operator, within 60 days after the increase, must either cause the penal sum to be increased to an amount at least equal to the current plugging and abandonment cost estimate and submit evidence of such increase to the Regional Administrator, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current plugging and abandonment cost estimate decreases, the penal sum may be reduced to the amount of the current plugging and abandonment cost estimate following written approval by the Regional Administrator.

(8) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner or operator and to the Regional Administrator. Cancellation may not occur, however, during 120 days beginning on the date of the receipt of the notice of cancellation by both owner or operator and the Regional Administrator as evidenced by the returned receipts.

(9) The owner or operator may cancel the bond if the Regional Administrator has given prior written consent based on his receipt of evidence of alternate

financial assurance as specified in this section.

(c) *Surety bond guaranteeing performance of plugging and abandonment.*

(1) An owner or operator may satisfy the requirements of this section by obtaining a surety bond which conforms to the requirements of this paragraph and submitting the bond to the Regional Administrator. An owner or operator of a new facility must submit the bond to the Regional Administrator with the permit application or for approval to operate under rule. The bond must be effective before injection of hazardous waste is started. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.

(2) The wording of the surety bond must be identical to the wording specified in § 144.70(c).

(3) The owner or operator who uses a surety bond to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all payments made thereunder will be deposited by the surety directly into the standby trust fund in accordance with instructions from the Regional Administrator. The standby trust must meet the requirements specified in § 144.63(a), except that:

(i) An original signed duplicate of the trust agreement must be submitted to the Regional Administrator with the surety bond; and

(ii) Unless the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these regulations:

(A) Payments into the trust fund as specified in § 144.63(a);

(B) Updating of Schedule A of the trust agreement [see § 144.70(a)] to show current plugging and abandonment cost estimates;

(C) Annual valuations as required by the trust agreement; and

(D) Notices of nonpayment as required by the trust agreement.

(4) The bond must guarantee that the owner or operator will:

(i) Perform plugging and abandonment in accordance with the plugging and abandonment plan and other requirements of the permit for the injection well whenever required to do so; or

(ii) Provide alternate financial assurance as specified in this section, and obtain the Regional Administrator's written approval of the assurance provided, within 90 days after receipt by both the owner or operator and the Regional Administrator of a notice of cancellation of the bond from the surety.

(5) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond. Following a determination that the owner or operator has failed to perform plugging and abandonment in accordance with the plugging and abandonment plan and other permit requirements when required to do so, under terms of the bond the surety will perform plugging and abandonment as guaranteed by the bond or will deposit the amount of the penal sum into the standby trust fund.

(6) The penal sum of the bond must be in an amount at least equal to the current plugging and abandonment cost estimate.

(7) Whenever the current plugging and abandonment cost estimate increases to an amount greater than the penal sum, the owner or operator, within 60 days after the increase, must either cause the penal sum to be increased to an amount at least equal to the current plugging and abandonment cost estimate and submit evidence of such increase to the Regional Administrator, or obtain other financial assurance as specified in this section. Whenever the plugging and abandonment cost estimate decreases, the penal sum may be reduced to the amount of the current plugging and abandonment cost estimate following written approval by the Regional Administrator.

(8) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner or operator and to the Regional Administrator. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the Regional Administrator, as evidenced by the return receipts.

(9) The owner or operator may cancel the bond if the Regional Administrator has given prior written consent. The Regional Administrator will provide such written consent when:

(i) An owner or operator substitute alternate financial assurance as specified in this section; or

(ii) The Regional Administrator releases the owner or operator from the requirements of this section in accordance with § 144.63(i).

(10) The surety will not be liable for deficiencies in the performance of plugging and abandonment by the owner or operator after the Regional Administrator releases the owner or operator from the requirements of this section in accordance with § 144.63(i).



(d) *Plugging and abandonment letter of credit* (1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph and submitting the letter to the Regional Administrator. An owner or operator of an injection well must submit the letter of credit to the Regional Administrator during submission of the permit application or for approval to operate under rule. The letter of credit must be effective before initial injection of hazardous waste. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.

(2) The wording of the letter of credit must be identical to the wording specified in § 144.70(d).

(3) An owner or operator who uses a letter of credit to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Regional Administrator will be deposited by the issuing institution directly into the standby trust fund in accordance with instructions from the Regional Administrator. This standby trust fund must meet the requirements of the trust fund specified in § 144.63(a), except that:

(i) An originally signed duplicate of the trust agreement must be submitted to the Regional Administrator with the letter of credit; and

(ii) Unless the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these regulations:

(A) Payments into the trust fund as specified in § 144.63(a);

(B) Updating of Schedule A of the trust agreement (see § 144.70(a)) to show current plugging and abandonment cost estimates;

(C) Annual valuations as required by the trust agreement; and

(D) Notices of nonpayment as required by the trust agreement.

(4) The letter of credit must be accompanied by a letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: the EPA Identification Number, name, and address of the facility, and the amount of funds assured for plugging and abandonment of the well by the letter of credit.

(5) The letter of credit must be irrevocable and issued for a period of at least 1 year. The letter of credit must provide that the expiration date will be

automatically extended for a period of at least 1 year unless, at least 120 days before the current expiration date, the issuing institution notifies both the owner or operator and the Regional Administrator by certified mail of a decision not to extend the expiration date. Under the terms of the letter of credit, the 120 days will begin on the date when both the owner or operator and the Regional Administrator have received the notice, as evidenced by the return receipts.

(6) The letter of credit must be issued in an amount at least equal to the current plugging and abandonment cost estimate, except as provided in § 144.63(g).

(7) Whenever the current plugging and abandonment cost estimate increases to an amount greater than the amount of the credit, the owner or operator, within 60 days after the increase, must either cause the amount of the credit to be increased so that it at least equals the current plugging and abandonment cost estimate and submit evidence of such increase to the Regional Administrator, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current plugging and abandonment cost estimate decreases, the amount of the credit may be reduced to the amount of the current plugging and abandonment cost estimate following written approval by the Regional Administrator.

(8) Following a determination that the owner or operator has failed to perform final plugging and abandonment in accordance with the plugging and abandonment plan and other permit requirements when required to do so, the Regional Administrator may draw on the letter of credit.

(9) If the owner or operator does not establish alternate financial assurance as specified in this section and obtain written approval of such alternate assurance from the Regional Administrator within 90 days after receipt by both the owner or operator and the Regional Administrator of a notice from the issuing institution that it has decided not to extend the letter of credit beyond the current expiration date, the Regional Administrator will draw on the letter of credit. The Regional Administrator may delay the drawing if the issuing institution grants an extension of the term of the credit. During the last 30 days of any such extension the Regional Administrator will draw on the letter of credit if the owner or operator has failed to provide alternate financial assurance as specified in this section and obtain written approval of such assurance from the Regional Administrator.

(10) The Regional Administrator will return the letter of credit to the issuing institution for termination when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The Regional Administrator releases the owner or operator from the requirements of this section in accordance with § 144.63(i).

(e) *Plugging and abandonment insurance*. (1) An owner or operator may satisfy the requirements of this section by obtaining plugging and abandonment insurance which conforms to the requirements of this paragraph and submitting a certificate of such insurance to the Regional Administrator. An owner or operator of a new injection well must submit the certificate of insurance to the Regional Administrator with the permit application or for approval to operate under rule. The insurance must be effective before injection starts. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

(2) The wording of the certificate of insurance must be identical to the wording specified in § 144.70(e).

(3) The plugging and abandonment insurance policy must be issued for a face amount at least equal to the current plugging and abandonment estimate, except as provided in § 144.63(g). The term "face amount" means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) The plugging and abandonment insurance policy must guarantee that funds will be available whenever final plugging and abandonment occurs. The policy must also guarantee that once plugging and abandonment begins, the insurer will be responsible for paying out funds, up to an amount equal to the face amount of the policy, upon the direction of the Regional Administrator, to such party or parties as the Regional Administrator specifies.

(5) After beginning plugging and abandonment, an owner or operator or any other person authorized to perform plugging and abandonment may request reimbursement for plugging and abandonment expenditures by submitting itemized bills to the Regional Administrator. Within 60 days after receiving bills for plugging and abandonment activities, the Regional Administrator will determine whether



the plugging and abandonment expenditures are in accordance with the plugging and abandonment plan or otherwise justified, and if so, he will instruct the insurer to make reimbursement in such amounts as the Regional Administrator specifies in writing. If the Regional Administrator has reason to believe that the cost of plugging and abandonment will be significantly greater than the face amount of the policy, he may withhold reimbursement of such amounts as he deems prudent until he determines, in accordance with § 144.63(i), that the owner or operator is no longer required to maintain financial assurance for plugging and abandonment of the injection well.

(6) The owner or operator must maintain the policy in full force and effect until the Regional Administrator consents to termination of the policy by the owner or operator as specified in paragraph (e)(10) of this section. Failure to pay the premium, without substitution of alternate financial assurance as specified in this section, will constitute a significant violation of these regulations, warranting such remedy as the Regional Administrator deems necessary. Such violation will be deemed to begin upon receipt by the Regional Administrator of a notice of future cancellation, termination, or failure to renew due to nonpayment of the premium, rather than upon the date of expiration.

(7) Each policy must contain provisions allowing assignment to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided such consent is not unreasonably refused.

(8) The policy must provide that the insurer may not cancel, terminate, or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may elect to cancel, terminate, or fail to renew the policy by sending notice by certified mail to the owner or operator and the Regional Administrator. Cancellation, termination, or failure to renew may not occur, however, during 120 days beginning with the date of receipt of the notice by both the Regional Administrator and the owner or operator, as evidenced by the return of receipts. Cancellation, termination, or failure to renew may not occur and the policy will remain in full force and effect in the event that on or before the date of expiration:

(i) The Regional Administrator deems the injection well abandoned; or

(ii) The permit is terminated or revoked or a new permit is denied; or

(iii) Plugging and abandonment is ordered by the Regional Administrator or a U.S. district court or other court of competent jurisdiction; or

(iv) The owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or

(v) The premium due is paid.

(9) Whenever the current plugging and abandonment cost estimate increases to an amount greater than the face amount of the policy, the owner or operator, within 60 days after the increase, must either cause the face amount to be increased to an amount at least equal to the current plugging and abandonment estimate and submit evidence of such increase to the Regional Administrator, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current plugging and abandonment cost estimate decreases, the face amount may be reduced to the amount of the current plugging and abandonment cost estimate following written approval by the Regional Administrator.

(10) The Regional Administrator will give written consent to the owner or operator that he may terminate the insurance policy when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The Regional Administrator releases the owner or operator from the requirements of this section in accordance with § 144.63(i).

(f) *Financial test and corporate guarantee for plugging and abandonment.*

(1) An owner or operator may satisfy the requirements of this section by demonstrating that he passes a financial test as specified in this paragraph. To pass this test the owner or operator must meet the criteria of either paragraphs (f)(1)(i) or (f)(1)(ii) of this section:

(i) The owner or operator must have:

(A) Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

(B) Net working capital and tangible net worth each at least six times the sum of the current plugging and abandonment cost estimate; and

(C) Tangible net worth of at least \$10 million; and

(D) Assets in the United States amounting to at least 90 percent of his total assets or at least six times the sum

of the current plugging and abandonment cost estimate.

(ii) The owner or operator must have:

(A) A current rating for his most recent bond issuance of AAA, AA, A or BBB as issued by Standard and Poor's or Aaa, Aa, A, or Baa as issued by Moody's; and

(B) Tangible net worth at least six times the sum of the current plugging and abandonment cost estimate; and

(C) Tangible net worth of at least \$10 million; and

(D) Assets located in the United States amounting to at least 90 percent of his total assets or at least six times the sum of the current plugging and abandonment cost estimates.

(2) The phrase "current plugging and abandonment cost estimate" as used in paragraph (f)(1) of this section refers to the cost estimate required to be shown in paragraphs 1-4 of the letter from the owner's or operator's chief financial officer [144.70(f)].

(3) To demonstrate that he meets this test, the owner or operator must submit the following items to the Regional Administrator:

(i) A letter signed by the owner's or operator's chief financial officer and worded as specified in 144.70(f); and

(ii) A copy of the independent certified public accountant's report on examination of the owner's or operator's financial statements for the latest completed fiscal year; and

(iii) A special report from the owner's or operator's independent certified public accountant to the owner or operator stating that:

(A) He has compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

(B) In connection with that procedure, no matters came to his attention which caused him to believe that the specified data should be adjusted.

(4) An owner or operator of a new injection well must submit the items specified in paragraph (f)(3) of this section to the Regional Administrator within 90 days after the close of each succeeding fiscal year. This information must consist of all three items specified in paragraph (f)(3) of this section.

(5) After the initial submission of items specified in paragraph (f)(3) of this section, the owner or operator must send updated information to the Regional Administrator within 90 days after the close of each succeeding fiscal year. This information must consist of



all three items specified in paragraph (f)(3) of this section.

(6) If the owner or operator no longer meets the requirements of paragraph (f)(1) of this section, he must send notice to the Regional Administrator of intent to establish alternate financial assurance as specified in this section. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year-end financial data show that the owner or operator no longer meets the requirements. The owner or operator must provide the alternate financial assurance within 120 days after the end of such fiscal year.

(7) The Regional Administrator may, based on a reasonable belief that the owner or operator may no longer meet the requirements of paragraph (f)(1) of this section, require reports of financial condition at any time from the owner or operator in addition to those specified in paragraph (f)(3) of this section. If the Regional Administrator finds, on the basis of such reports or other information, that the owner or operator no longer meets the requirements of (f)(1) of this section, the owner or operator must provide alternate financial assurance as specified in this section within 30 days after notification of such a finding.

(8) The Regional Administrator may disallow use of this test on the basis of qualifications in the opinion expressed by the independent certified public accountant in his report on examination of the owner's or operator's financial statements [see paragraph (f)(3)(ii) of this section]. An adverse opinion or disclaimer of opinion will be cause for disallowance. The Regional Administrator will evaluate other qualifications on an individual basis. The owner or operator must provide alternate financial assurance as specified in this section within 30 days after notification of the disallowance.

(9) The owner or operator is no longer required to submit the items specified in paragraph (f)(3) of this section when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The Regional Administrator releases the owner or operator from the requirements of this section in accordance with § 144.63(i).

(10) An owner or operator may meet the requirements of this section by obtaining a written guarantee, hereafter referred to as "corporate guarantee." The guarantee must be the parent corporation of the owner or operator. The guarantee must meet the requirements for owners or operators in paragraphs (f)(1) through (f)(8) of this section and must comply with the terms

of the corporate guarantee. The wording of the corporate guarantee must be identical to the wording specified in § 144.70(h). The corporate guarantee must accompany the items sent to the Regional Administrator as specified in paragraph (f)(3) of this section. The terms of the corporate guarantee must provide that:

(i) If the owner or operator fails to perform plugging and abandonment of the injection well covered by the corporate guarantee in accordance with the plugging and abandonment plan and other permit requirements whenever required to do so, the guarantee will do so or establish a trust fund as specified in § 144.63(a) in the name of the owner or operator.

(ii) The corporate guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the owner or operator and the Regional Administrator, as evidenced by the return receipts. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the Regional Administrator, as evidenced by the return receipts.

(iii) If the owner or operator fails to provide alternate financial assurance as specified in this section and obtain the written approval of such alternate assurance from the Regional Administrator within 90 days after receipt by both the owner or operator and the Regional Administrator of a notice of cancellation of the corporate guarantee from the guarantor, the guarantor will provide such alternative financial assurance in the name of the owner or operator.

(g) *Use of multiple financial mechanisms.* An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per injection well. These mechanisms are limited to trust funds, surety bonds, guaranteeing payment into a trust fund, letters of credit, and insurance. The mechanisms must be as specified in paragraphs (a), (b), (d), and (e), respectively, of this section, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the adjusted plugging and abandonment cost. If an owner or operator uses a trust fund in combination with a surety bond or letter of credit, he may use that trust fund as the standby trust fund for the other mechanisms. A single standby trust may be established for two or more mechanisms. The Regional Administrator may invoke any or all of

the mechanisms to provide for plugging and abandonment of the injection well.

(h) *Use of a financial mechanism for multiple facilities.* An owner or operator may use a financial assurance mechanism specified in this section to meet the requirements of this section for more than one injection well. Evidence of financial assurance submitted to the Regional Administrator must include a list showing, for each injection well, the EPA Identification Number, name, address, and the amount of funds for plugging and abandonment assured by the mechanism. If the injection wells covered by the mechanism are in more than one Region, identical evidence of financial assurance must be submitted to and maintained with the Regional Administrators of all such Regions. The amount of funds available through the mechanism must be no less than the sum of funds that would be available if a separate mechanism had been established and maintained for each injection well. In directing funds available through the mechanism for plugging and abandonment of any of the injection wells covered by the mechanism, the Regional Administrator may direct only the amount of funds designated for that injection well, unless the owner or operator agrees to use additional funds available under the mechanism.

(i) *Release of the owner or operator from the requirements of this Section.* Within 60 days after receiving certifications from the owner or operator and an independent registered professional engineer that plugging and abandonment has been accomplished in accordance with the plugging and abandonment plan, the Regional Administrator will notify the owner or operator in writing that he is no longer required by this section to maintain financial assurance for plugging and abandonment of the injection well, unless the Regional Administrator has reason to believe that plugging and abandonment has not been in accordance with the plugging and abandonment plan.

#### § 144.64 Incapacity of owners or operators, guarantors, or financial institutions.

(a) An owner or operator must notify the Regional Administrator by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee as specified in § 144.63(f) must make such a



notification if he is named as debtor, as required under the terms of the guarantee (§ 144.70(f)).

(b) An owner or operator who fulfills the requirements of § 144.63 by obtaining a letter of credit, surety bond, or insurance policy will be deemed to be without the required financial assurance or liability coverage in the event of bankruptcy, insolvency, or a suspension or revocation of the license or charter of the issuing institution. The owner or operator must establish other financial assurance or liability coverage within 60 days after such an event.

#### § 144.65 Use of State-required mechanisms.

(a) For a facility located in a State where EPA is administering the requirements of this Subpart but where the State has plugging and abandonment regulations that include requirements for financial assurance of plugging and abandonment, an owner or operator may use State-required financial mechanisms to meet the requirements of this Subpart if the Regional Administrator determines that the State mechanisms are at least equivalent to the mechanisms specified in this Subpart. The Regional Administrator will evaluate the equivalency of the mechanisms mainly in terms of (1) certainty of the availability of funds for the required plugging and abandonment activities and (2) the amount of funds that will be made available. The Regional Administrator may also consider other factors. The owner or operator must submit to the Regional Administrator evidence of the establishment of the mechanism together with a letter requesting that the State-required mechanism be considered acceptable for meeting the requirements of this Subpart. The submittal must include the following information: The facility's EPA Identification Number, name and address, and the amounts of funds for plugging and abandonment coverage assured by the mechanism. The Regional Administrator will notify the owner or operator of his determination regarding the mechanism's acceptability. The Regional Administrator may require the owner or operator to submit additional information as is deemed necessary for making this determination.

(b) If a State-required mechanism is found acceptable as specified in paragraph (a) of this Section except for the amount of funds available, the owner or operator may satisfy the requirements of this Subpart by increasing the funds available through the State-required mechanism or using additional mechanisms as specified in

this Subpart. The amounts of funds available through the State and Federal mechanisms must at least equal the amounts required by this Subpart.

#### § 144.66 State assumption of responsibility.

(a) If a State either assumes legal responsibility for an owner's or operator's compliance with the plugging and abandonment requirements of these regulations or assures that funds will be available from State sources to cover these requirements, the owner or operator will be in compliance with the requirements of this Subpart if the Regional Administrator determines that the State's assumption of responsibility is at least equivalent to the mechanisms specified in this Subpart. The Regional Administrator will evaluate the equivalency of State guarantees mainly in terms of (1) certainty of the availability of funds for the required plugging and abandonment coverage and (2) the amount of funds that will be made available. The Regional Administrator may also consider other factors. The owner or operator must submit to the Regional Administrator a letter from the State describing the nature of the State's assumption of responsibility together with a letter from the owner or operator requesting that the State's assumption of responsibility be considered acceptable for meeting the requirements of this Subpart. The letter from the State must include, or have attached to it, the following information: the facility's EPA Identification Number, name and address, and the amounts of funds for plugging and abandonment coverage that are guaranteed by the State. The Regional Administrator will notify the owner or operator of his determination regarding the acceptability of the State's guarantee in lieu of mechanisms specified in this Subpart. The Regional Administrator may require the owner or operator to submit additional information as is deemed necessary to make this determination. Pending this determination, the owner or operator will be deemed to be in compliance with § 144.63.

(b) If a State's assumption of responsibility is found acceptable as specified in paragraph (a) of this section except for the amount of funds available, the owner or operator may satisfy the requirements of this Subpart by use of both the State's assurance and additional financial mechanisms as specified in this Subpart. The amount of funds available through the State and Federal mechanisms must at least equal the amount required by this Subpart.

#### § 144.70 Wording of the instruments.

(a)(1) A trust agreement for a trust fund, as specified in § 144.63(a) of this chapter, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

##### Trust Agreement

TRUST AGREEMENT, the "Agreement," entered into as of [date] by and between [name of the owner or operator], a [name of State] [insert "corporation," "partnership," "association," or "proprietorship"], the "Grantor," and [name of corporate trustee], [insert "incorporated in the State of \_\_\_\_\_" or "a national bank"], the "Trustee."

Whereas, the United States Environmental Protection Agency, "EPA," an agency of the United States Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of an injection well shall provide assurance that funds will be available when needed for plugging and abandonment of the injection well,

Whereas, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facility(ies) identified herein,

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee,

Now, therefore, the Grantor and the Trustee agree as follows:

##### Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

(c) Facility or activity means any "underground injection well" or any other facility or activity that is subject to regulation under the Underground Injection Control Program.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A [on Schedule A, for each facility list the EPA Identification Number, name, address, and the current plugging and abandonment cost estimate, or portions thereof, for which financial assurance is demonstrated by this Agreement].

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund, the "Fund," for the benefit of EPA. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided.



The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by EPA.

**Section 4. Payment for Plugging and Abandonment.** The Trustee shall make payments from the Fund as the EPA Regional Administrator shall direct, in writing, to provide for the payment of the costs of plugging and abandonment of the injection wells covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the EPA Regional Administrator from the Fund for plugging and abandonment expenditures in such amounts as the EPA Regional Administrator shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the EPA Regional Administrator specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

**Section 5. Payments Comprising the Fund.** Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

**Section 6. Trustee Management.** The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 USC § 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and

(iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

**Section 7. Commingling and Investment.** The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment

Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote shares in its discretion.

**Section 8. Express Powers of Trustee.** Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

**Section 9. Taxes and Expenses.** All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

**Section 10. Annual Valuation.** The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the appropriate EPA Regional Administrator a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to

object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the EPA Regional Administrator shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

**Section 11. Advice of Counsel.** The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement of any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

**Section 12. Trustee Compensation.** The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

**Section 13. Successor Trustee.** The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the EPA Regional Administrator, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

**Section 14. Instructions to the Trustee.** All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the EPA Regional Administrator to the Trustee shall be in writing, signed by the EPA Regional Administrators of the Regions in which the facilities are located, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or EPA hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or EPA, except as provided for herein.



**Section 15. Notice of Nonpayment.** The Trustee shall notify the Grantor and the appropriate EPA Regional Administrator, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

**Section 16. Amendment of Agreement.** This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the appropriate EPA Regional Administrator, or by the Trustee and the appropriate EPA Regional Administrator if the Grantor ceases to exist.

**Section 17. Irrevocability and Termination.** Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the EPA Regional Administrator, or by the Trustee and the EPA Regional Administrator if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

**Section 18. Immunity and Indemnification.** The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the EPA Regional Administrator issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

**Section 19. Choice of Law.** This Agreement shall be administered, construed, and enforced according to the laws of the State of [insert name of State].

**Section 20. Interpretation.** As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 144.70(a)(1) as such regulations were constituted on the date first above written.

[Signature of Grantor]

By [Title]

Attest:

[Title]

[Seal]

[Signature of Trustee]

By

Attest:

[Title]

[Seal]

(2) The following is an example of the certification of acknowledgment which must accompany the trust agreement for a trust fund as specified in § 144.63(a). State requirements may differ on the proper content of this acknowledgment.

State of \_\_\_\_\_  
County of \_\_\_\_\_

On this [date], before me personally came [owner or operator] to me known, who, being by me duly sworn, did depose and say that she/he resides at [address], that she/he is [title] of [corporation], the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order to the Board of Directors of said corporation, and that she/he signed her/his name thereto by like order.

[Signature of Notary Public]

(b) A surety bond guaranteeing payment into a trust fund, as specified in § 144.63 of this chapter, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

#### Financial Guarantee Bond

Dated bond executed: \_\_\_\_\_

Effective date: \_\_\_\_\_

Principal: [legal name and business address of owner or operator].

Type of organization: [insert "individual," "joint venture," "partnership," or "corporation"].

State of incorporation: \_\_\_\_\_

Surety(ies): [name(s) and business address(es)].

EPA Identification Number, name, address, and plugging and abandonment amount(s) for each facility guaranteed by this bond [indicate plugging and abandonment amounts separately]: \_\_\_\_\_

Total penal sum of bond: \$ \_\_\_\_\_

Surety's bond number: \_\_\_\_\_

Know All Persons By These Presents, That we, the Principal and Surety(ies) hereto are firmly bound to the U.S. Environmental Protection Agency (hereinafter called EPA), in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

Whereas said Principal is required, under the Underground Injection Control Regulations (UIC), to have a permit or comply with requirements to operate under rule in

order to own or operate each injection well identified above, and

Whereas said Principal is required to provide financial assurance for plugging and abandonment as a condition of the permit or provisions to operate under rule, and

Whereas said Principal shall establish a standby trust fund as is required when a surety bond is used to provide such financial assurance;

Now, therefore, the conditions of the obligation are such that if the Principal shall faithfully, before the beginning of plugging and abandonment of each injection well identified above, fund the standby trust fund in the amount(s) identified above for the injection well,

Or if the Principal shall fund the standby trust fund in such amount(s) within 15 days after an order to begin plugging and abandonment is issued by an EPA Regional Administrator or a U.S. district court or other court of competent jurisdiction,

Or, if the Principal shall provide alternate financial assurance, as specified in Subpart F of 40 CFR 144, as applicable, and obtain the EPA Regional Administrator's written approval of such assurance, within 90 days after the date of notice of cancellation is received by both the Principal and the EPA Regional Administrator(s) from the Surety(ies), then this obligation shall be null and void, otherwise it is to remain in full force and effect.

The Surety(ies) shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above. Upon notification by an EPA Regional Administrator that the Principal has failed to perform as guaranteed by this bond, the Surety(ies) shall place funds in the amount guaranteed for the injection well(s) into the standby trust funds as directed by the EPA Regional Administrator.

The liability of the Surety(ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligation of the Surety(ies) hereunder exceed the amount of said penal sum.

The Surety(ies) may cancel the bond by sending notice of cancellation by certified mail to the Principal and to the EPA Regional Administrator(s) for the Region(s) in which the injection well(s) is (are) located, provided, however, that that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by both the Principal and the EPA Regional Administrator(s), as evidenced by the return receipts.

The Principal may terminate this bond by sending written notice to the Surety(ies), provided, however, that no such notice shall become effective until the Surety(ies) receive(s) written authorization for termination of the bond by the EPA Regional Administrator(s) of the Region(s) in which the bonded facility(ies) is (are) located.

[The following paragraph is an optional rider that may be included but is not required.]



Principal and Surety(ies) hereby agree to adjust the penal sum of the bond yearly so that it guarantees a new plugging and abandonment amount, provided that the penal sum does not increase by more than 20 percent in any one year, and no decrease in the penal sum takes place without the written permission of the EPA Regional Administrator(s).

In Witness Whereof, the Principal and Surety(ies) have executed this Financial Guarantee Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety(ies) and that the wording of this surety bond is identical to the wording specified in 40 CFR 144.70(b) as such regulations were constituted on the date this bond was executed.

Principal

[Signature(s)]

[Name(s)]

[Title(s)]

[Corporate seal]

Corporate Surety(ies)

[Name and address]

State of incorporation: \_\_\_\_\_

Liability limit: \$ \_\_\_\_\_

[Signature(s)]

[Name(s) and title(s)]

[Corporate seal]

[For every co-surety, provide signature(s), corporate seal, and other information in the same manner as for Surety above.]

Bond premium: \$ \_\_\_\_\_

(c) A surety bond guaranteeing performance of plugging and abandonment, as specified in § 144.63(c), must be worded as follows, except that the instructions in brackets are to be replaced with the relevant information and the brackets deleted:

#### Performance Bond

Date bond executed: \_\_\_\_\_

Effective date: \_\_\_\_\_

Principal: [legal name and business address of owner or operator].

Type of organization: [insert "individual," "joint venture," "partnership," or "corporation"].

State of incorporation: \_\_\_\_\_

Surety(ies): [name(s) and business address(es)]

EPA Identification Number, name, address, and plugging and abandonment amounts(s) for each injection well guaranteed by this bond [indicate plugging and abandonment amounts for each well]:

Total penal sum of bond: \$ \_\_\_\_\_

Surety's bond number: \_\_\_\_\_

Know All Persons By These Presents, That We, the Principal and Surety(ies) hereto are firmly bound to the U.S. Environmental Protection Agency [hereinafter called EPA], in the above penal sum for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and

assigns jointly and severally; provided that, where the Surety(ies) are corporations acting as co-sureties, we, the Sureties, bind ourselves in such sum "jointly and severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety, but if no limit of liability is indicated, the limit of liability shall be the full amount of the penal sum.

Whereas said Principal is required, under the Underground Injection Control Regulations, as amended, to have a permit or comply with provisions to operate under rule for each injection well identified above, and

Whereas said Principal is required to provide financial assurance for plugging and abandonment as a condition of the permit or approval to operate under rule, and

Whereas said Principal shall establish a standby trust fund as is required when a surety bond is used to provide such financial assurance;

Now, Therefore, the conditions of this obligation are such that if the Principal shall faithfully perform plugging and abandonment, whenever required to do so, of each injection well for which this bond guarantees plugging and abandonment, in accordance with the plugging and abandonment plan and other requirements of the permit or provisions for operating under rule and other requirements of the permit or provisions for operating under rule as may be amended, pursuant to all applicable laws, statutes, rules and regulations, as such laws, statutes, rules, and regulations may be amended,

Or, if the Principal shall provide alternate financial assurance as specified in Subpart F of 40 CFR 144, and obtain the EPA Regional Administrator's written approval of such assurance, within 90 days after the date of notice of cancellation is received by both the Principal and the EPA Regional Administrator(s) from the Surety(ies), then this obligation shall be null and void, otherwise it is to remain in full force and effect.

The Surety(ies) shall become liable on this bond obligation only when the Principal has failed to fulfill the conditions described above.

Upon notification by an EPA Regional Administrator that the Principal has been found in violation of the plugging and abandonment requirements of 40 CFR 144, for an injection well which this bond guarantees performances of plugging and abandonment, the Surety(ies) shall either perform plugging and abandonment in accordance with the plugging and abandonment plan and other permit requirements or provisions for operating under rule and other requirements or place the amount for plugging and abandonment into a standby trust fund as directed by the EPA Regional Administrator.

Upon notification by an EPA Regional Administrator that the Principal has failed to provide alternate financial assurance as specified in Subpart F of 40 CFR 144, and obtain written approval of such assurance from the EPA Regional Administrator(s) during the 90 days following receipt by both

the Principal and the EPA Regional Administrator(s) of a notice of cancellation of the bond, the Surety(ies) shall place funds in the amount guaranteed for the injection well(s) into the standby trust fund as directed by the EPA Regional Administrator.

The surety(ies) hereby waive(s) notification of amendments to plugging and abandonment plans, permits, applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Surety(ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the aggregate to the penal sum of the bond, but in no event shall the obligation of the Surety(ies) hereunder exceed the amount of said penal sum.

The Surety(ies) may cancel the bond by sending notice by certified mail to the owner or operator and to the EPA Regional Administrator(s) for the Region(s) in which the injection well(s) is (are) located, provided, however, that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by both the Principal and the EPA Regional Administrator(s), as evidenced by the return receipts.

The principal may terminate this bond by sending written notice to the Surety(ies), provided, however, that no such notice shall become effective until the Surety(ies) receive(s) written authorization for termination of the bond by the EPA Regional Administrator(s) of the EPA Region(s) in which the bonded injection well(s) is (are) located.

[The following paragraph is an optional rider that may be included but is not required.]

Principal and Surety(ies) hereby agree to adjust the penal sum of the bond yearly so that it guarantees a new plugging and abandonment amount, provided that the penal sum does not increase by more than 20 percent in any one year, and no decrease in the penal sum takes place without the written permission of the EPA Regional Administrator(s).

In Witness Whereof, The Principal and Surety(ies) have executed this Performance Bond and have affixed their seals on the date set forth above.

The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety(ies) and that the wording on this surety bond is identical to the wording specified in 40 CFR 144.70(c) as such regulation was constituted on the date this bond was executed.

Principal.

[Signature(s)]

[Name(s)]

[Title(s)]

[Corporate seal]

[Corporate Surety(ies)]

[Name and address]

State of incorporation: \_\_\_\_\_

Liability limit: \$ \_\_\_\_\_

[Signature(s)]



**[Name(s) and title(s)]**

Corporate seal:

[For every co-surety, provide signature(s), corporate seal, and other information in the same manner as for Surety above.]

Bond premium: \$\_\_\_\_\_.

(d) A letter of credit, as specified in § 144.63(d) of this chapter, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

**Irrevocable Standby Letter of Credit**

Regional Administrator(s) \_\_\_\_\_

Region(s) \_\_\_\_\_

U.S. Environmental Protection Agency.

Dear Sir or Madam:

We hereby establish our Irrevocable Standby Letter of Credit No. \_\_\_\_\_ in your favor, at the request and for the account of [owner's or operator's name and address] up to the aggregate amount of [in words] U.S. dollars \$\_\_\_\_\_, available upon presentation [insert, if more than one Regional Administrator is a beneficiary, "by any one of you"] of

(1) Your sight draft, bearing reference to this letter of credit No. \_\_\_\_\_, and

(2) Your signed statement reading as follows: "I certify that the amount of the draft is payable pursuant to regulations issued under authority of the Safe Drinking Water Act."

This letter of credit is effective as of [date] and shall expire on [date at least 1 year later], but such expiration date shall be automatically extended for a period of [at least 1 year] on [date] and on each successive expiration date, unless, at least 120 days before the current expiration date, we notify both you and [owner's or operator's name] by certified mail that we have decided not to extend this letter of credit beyond the current expiration date. In the event you are so notified, any unused portion of the credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by both you and [owner's or operator's name], as shown on the signed return receipts.

Whenever this letter of credit is drawn on under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft directly into the standby trust fund of [owner's or operator's name] in accordance with your instructions.

We certify that the wording of this letter of credit is identical to the wording specified in 40 CFR 144.70(d) as such regulations were constituted on the date shown immediately below.

[Signature(s) and title(s) of official(s) of issuing institution]

[Date]

This credit is subject to [insert "the most recent edition of the Uniform Customs and Practice for Documentary Credits, published by the International Chamber of Commerce," or "the Uniform Commercial Code"].

(e) A certificate of insurance, as specified in § 144.63(e) of this chapter, must be worded as follows, except that instructions in brackets are to be

replaced with the relevant information and the brackets deleted:

Certificate of Insurance for Plugging and Abandonment

Name and Address of Insurer (herein called the "insurer"):

Name and Address of Insurer (herein called the "insurer"):

Injection Wells covered: [list for each well: The EPA Identification Number, name, address, and the amount of insurance for plugging and abandonment (these amounts for all injection wells covered must total the face amount shown below).]

Face Amount: \_\_\_\_\_

Policy Number: \_\_\_\_\_

Effective Date: \_\_\_\_\_

The insurer hereby certifies that it has issued to the Insured the policy of insurance identified above to provide financial assurance for plugging and abandonment for the injection wells identified above. The Insurer further warrants that such policy conforms in all respects with the requirements of 40 CFR 144.63(e), as applicable and as such regulations were constituted on the date shown immediately below. It is agreed that any provision of the policy inconsistent with such regulations is hereby amended to eliminate such inconsistency.

Whenever requested by the EPA Regional Administrator(s) of the U.S. Environmental Protection Agency, the Insurer agrees to furnish to the EPA Regional Administrator(s) a duplicate original of the policy listed above, including all endorsements thereon.

I hereby certify that the wording of this certificate is identical to the wording specified in 40 CFR 144.70(e) as such regulations were constituted on the date shown immediately below.

[Authorized signature of Insurer]

[Name of person signing]

[Title of person signing]

[Signature of witness or notary:]

[Date]

(f) A letter from the chief financial officer, as specified in § 144.63(f) of this chapter, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

**Letter From Chief Financial Officer**

[Address to Regional Administrator of every Region in which injection wells for which financial responsibility is to be demonstrated through the financial test are located.]

I am the chief financial officer of [name and address of firm.] This letter is in support of this firm's use of the financial test to demonstrate financial assurance, as specified in Subpart F of 40 CFR Part 144.

[Fill out the following four paragraphs regarding injection wells and associated cost estimates. If your firm has no injection wells that belong in a particular paragraph, write "None" in the space indicated. For each

injection well, include its EPA Identification Number, name, address, and current plugging and abandonment cost estimate.]

1. This firm is the owner or operator of the following injection wells for which financial assurance for plugging and abandonment is demonstrated through the financial test specified in Subpart F of 40 CFR Part 144. The current plugging and abandonment cost estimate covered by the test is shown for each injection well: \_\_\_\_\_.

2. This firm guarantees, through the corporate guarantee specified in Subpart F of 40 CFR Part 144, the plugging and abandonment of the following injection wells owned or operated by subsidiaries of this firm. The current cost estimate for plugging and abandonment so guaranteed is shown for each injection well: \_\_\_\_\_.

3. In States where EPA is not administering the financial requirements of Subpart F of 40 CFR 144, this firm, as owner or operator or guarantor, is demonstrating financial assurance for the plugging and abandonment of the following injection wells through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart F of 40 CFR 144. The current plugging and abandonment cost estimate covered by such a test is shown for each injection well: \_\_\_\_\_.

4. This firm is the owner or operator of the following injection wells for which financial assurance for plugging and abandonment is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart F of 40 CFR 144 or equivalent or substantially equivalent State mechanisms. The current plugging and abandonment cost estimate not covered by such financial assurance is shown for each injection well: \_\_\_\_\_.

This firm [insert "is required" or "is not required"] to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on [month, day]. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended [date].

[Fill in Alternative I if the criteria of paragraph (f)(1)(i) of § 144.63 of this chapter are used. Fill in Alternative II if the criteria of paragraph (f)(1)(ii) of § 144.63 of this chapter are used.]

**ALTERNATIVE I**

1. (a) Current plugging and abandonment cost..... \$\_\_\_\_\_
- (b) Sum of the company's financial responsibilities under 40 CFR 264 and 265, Subpart H, currently met using the financial test or corporate guarantee.....
- (c) Total of lines a and b.....
- \*2. Total liabilities [If any portion of the plugging and abandonment cost is included in total liabilities, you may deduct the amount of that portion from this line and add that amount to lines 3 and 4].....
- \*3. Tangible net worth.....
- \*4. Net worth.....
- \*5. Current assets.....
- \*6. Current liabilities.....
- \*7. Net working capital [line 5 minus line 6].....
- \*8. The sum of net income plus depreciation, depletion and amortization.....



## ALTERNATIVE I—Continued

\*9. Total assets in U.S. (required only if less than 90% of firm's assets are located in U.S.)

Yes No

10. Is line 3 at least \$10 million?

11. Is line 3 at least 6 times line 1(c)?

12. Is line 7 at least 6 times line 1(c)?

\*13. Are at least 90% of firm's assets located in the U.S.? If not, complete line 14.

14. Is line 9 at least 6 times line 1(c)?

15. Is line 2 divided by line 4 less than 2.0?

16. Is line 8 divided by line 2 greater than 0.1?

17. Is line 5 divided by line 6 greater than 1.5?

## Alternative II

1. (a) Current plugging and abandonment cost \$

(b) Sum of the company's financial responsibilities under 40 CFR 284 and 285, Subpart H, currently met using the financial test or corporate guarantee

(c) Total of lines a and b

2. Current bond rating of most recent issuance of this firm and name of rating service

3. Date of issuance of bond

4. Date of maturity of bond

\*5. Tangible net worth (if any portion of the plugging and abandonment cost estimate is included in "total liabilities" on your firm's financial statements, you may add the amount of that portion to this line)

\*6. Total assets in U.S. (required only if less than 90% of firm's assets are located in U.S.)

Yes No

7. Is line 5 at least \$10 million?

8. Is line 5 at least 6 times line 1(c)?

\*9. Are at least 90% of the firm's assets located in the U.S.? If not, complete line 10

10. Is line 6 at least 6 times line 1(c)?

1(c)?

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 144.70(f) as such regulations were constituted on the date shown immediately below.

[Signature]

[Name]

[Title]

[Date]

(g) A corporate guarantee as specified in § 144.63(e) must be worded as follows except that instructions in brackets are to be replaced with the relevant information and the bracketed material deleted:

## Guarantee for Plugging and Abandonment

Guarantee made this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, by [name of guaranteeing entity], a business corporation organized under the laws of the State of \_\_\_\_\_, herein referred to as guarantor, to the United States Environmental Protection Agency (EPA), obligee, on behalf of our subsidiary [owner or operator] of [business address].

Recitals

1. Guarantor meets or exceeds the financial test criteria and agrees to comply with the reporting requirements for guarantors as specified in 40 CFR 144.63(e).

2. [Owner or operator] owns or operates the following Class I hazardous waste injection well covered by this guarantee: [List for each facility: EPA Identification Number, name, and address. Indicate for each whether guarantee is for closure, post-closure care, or both.]

3. "Plugging and abandonment plan" as used below refers to the plans maintained as required by 40 CFR Part 144 for the plugging and abandonment of injection wells as identified above.

4. For value received from [owner or operator], guarantor guarantees to EPA that in the event that [owner or operator] fails to perform ["plugging and abandonment"] of the above facility(ies) in accordance with the plugging and abandonment plan and other requirements when required to do so, the guarantor will do so or fund a trust fund as specified in 40 CFR 144.63 in the name of [owner or operator] in the amount of the adjusted plugging and abandonment cost estimates prepared as specified in 40 CFR 144.62.

5. Guarantor agrees that, if at the end of any fiscal year before termination of this guarantee, the guarantor fails to meet the financial test criteria, guarantor will send within 90 days, by certified mail, notice to the EPA Regional Administrator(s) for the Region(s) in which the facility(ies) is (are) located and to [owner or operator] that he intends to provide alternate financial assurance as specified in 40 CFR 144.63 in the name of [owner or operator]. Within 30 days after sending such notice, the guarantor will establish such financial assurance if [owner or operator] has not done so.

6. The guarantor agrees to notify the Regional Administrator, by certified mail, of a voluntary or involuntary case under Title 11, U.S. Code, naming guarantor as debtor, within 10 days after its commencement.

7. Guarantor agrees that within 30 days after being notified by an EPA Regional Administrator of a determination that guarantor no longer meets the financial test criteria or that he is disallowed from continuing as a guarantor of plugging and abandonment, he will establish alternate financial assurance, as specified in 40 CFR 144.63, in the name of [owner or operator] if [owner or operator] has not done so.

8. Guarantor agrees to remain bound under this guarantee notwithstanding any or all of the following: amendment or modification of the plugging and abandonment plan, the extension or reduction of the time of performance of plugging and abandonment or any other modification or alteration of an obligation of [owner or operator] pursuant to 40 CFR Part 144.

9. Guarantor agrees to remain bound under this guarantee for so long as [owner or operator] must comply with the applicable financial assurance requirements of 40 CFR Part 144 for the above-listed facilities, except that guarantor may cancel this guarantee by sending notice by certified mail, to the EPA Regional Administrator(s) for the Region(s) in which the facility(ies) is (are) located and to [owner or operator], such cancellation to become effective no earlier than 120 days after actual receipt of such notice by both

EPA and [owner or operator] as evidenced by the return receipts.

10. Guarantor agrees that if [owner or operator] fails to provide alternate financial assurance and obtain written approval of such assurance from the EPA Regional Administrator(s) within 90 days after a notice of cancellation by the guarantor is received by both the EPA Regional Administrator(s) and [owner or operator], guarantor will provide alternate financial assurance as specified in 40 CFR 144.63 in the name of [owner or operator].

11. Guarantor expressly waives notice of acceptance of this guarantee by the EPA or by [owner or operator]. Guarantor also expressly waives notice of amendments or modifications of the plugging and abandonment plan.

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR 144.70(f).

Effective date: \_\_\_\_\_

[Name of guarantor]

[Authorized signature for guarantor]

[Type name of person signing]

[Title of person signing]

Signature of witness or notary: \_\_\_\_\_

A new Part 147 is added to 40 CFR chapter I to read as follows:

## PART 147—STATE UNDERGROUND INJECTION CONTROL PROGRAMS

## Subpart A—General Provisions

Sec.

147.1 Purpose and scope.

147.2 Severability of provisions.

## Subpart B—Alabama

147.50 State-administered program—Class II wells.

147.51 State-administered program—Class I, III, IV, and V wells.

## Subpart C—Alaska

147.100 State-administered program.

[Reserved]

147.101 EPA-administered program.

147.102 Aquifer exemptions.

147.103 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.

147.104 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.

## Subpart D—Arizona

147.150 State-administered program.

[Reserved]

147.151 EPA-administered program.

147.152 Aquifer exemptions. [Reserved]

## Subpart E—Arkansas

147.200 State-administered program—Class I, III, IV, and V wells.

147.201 State-administered program—Class II wells. [Reserved]

## Subpart F—California

147.250 State-administered program—Class II wells.

147.251 EPA-administered program—Class I, III, IV, and V wells.

147.252 Aquifer exemptions. [Reserved]



147.253 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.

#### Subpart G—Colorado

147.300 State-administered program. [Reserved]  
147.301 EPA-administered program—Class I, III, IV and V wells.  
147.302 Aquifer exemptions.  
147.303 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.304 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.  
147.305 Requirements for all wells.

#### Subpart H—Connecticut

147.350–147.359 [Reserved]

#### Subpart I—Delaware

147.400–147.449 [Reserved]

#### Subpart J—District of Columbia

147.450 State-administered program. [Reserved]  
147.451 EPA-administered program.  
147.452 Aquifer exemptions. [Reserved]

#### Subpart K—Florida

147.500 State-administered program—Class I, III, IV, and V wells.  
147.501 State-administered program—Class II wells. [Reserved]

#### Subpart L—Georgia

147.550–147.559 [Reserved]

#### Subpart M—Hawaii

147.600–147.649 [Reserved]

#### Subpart N—Idaho

147.650 State-administered program. [Reserved]  
147.651 EPA-administered program.  
147.652 Aquifer exemptions. [Reserved]

#### Subpart O—Illinois

147.700 State-administered program—Class I, III, IV, and V wells.  
147.701 State-administered program—Class II wells.

#### Subpart P—Indiana

147.750 State-administered program. [Reserved]  
147.751 EPA-administered program.  
147.752 Aquifer exemptions. [Reserved]  
147.753 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.754 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.  
147.755 Requirements for all wells.

#### Subpart Q—Iowa

147.800 State-administered program. [Reserved]  
147.801 EPA-administered program.  
147.802 Aquifer exemptions. [Reserved]

#### Subpart R—Kansas

147.850 State-administered program—Class I, III, IV and V wells.  
147.851 State-administered program—Class II wells.

#### Subpart S—Kentucky

147.900 State-administered program. [Reserved]  
147.901 EPA-administered program.  
147.902 Aquifer exemptions. [Reserved]  
147.903 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.904 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.  
147.905 Requirements for all wells.

#### Subpart T—Louisiana

147.950 State-administered program.

#### Subpart U—Maine

147.1000 State-administered program.

#### Subpart V—Maryland

147.1050–147.1099 [Reserved]

#### Subpart W—Massachusetts

147.1100 State-administered program.

#### Subpart X—Michigan

147.1150 State-administered program. [Reserved]  
147.1151 EPA-administered program.  
147.1152 Aquifer exemptions. [Reserved]  
147.1153 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.1154 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.  
147.1155 Requirements for all wells.

#### Subpart Y—Minnesota

147.1200 State-administered program. [Reserved]  
147.1201 EPA-administered program.  
147.1202 Aquifer exemptions. [Reserved]

#### Subpart Z—Mississippi

147.1250 State-administered program—Class I, III, IV, and V wells.  
147.1251 State-administered program—Class II wells. [Reserved]

#### Subpart AA—Missouri

147.1300 State-administered program.  
147.1301 EPA-administered program—Class I, III, IV, and V wells.  
147.1302 Aquifer exemptions. [Reserved]

#### Subpart BB—Montana

147.1350 State-administered program. [Reserved]  
147.1351 EPA-administered program.  
147.1352 Aquifer exemptions.  
147.1353 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.1354 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.  
147.1355 Requirements for all wells.

#### Subpart CC—Nebraska

147.1400 State-administered program—Class II wells.  
147.1401 EPA-administered program—Class I, III, IV, and V wells.  
147.1402 Aquifer exemptions. [Reserved]

#### Subpart DD—Nevada

147.1450 State-administered program. [Reserved]  
147.1451 EPA-administered program.  
147.1452 Aquifer exemptions.  
147.1453 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.1454 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.

#### Subpart EE—New Hampshire

147.1500 State-administered program.

#### Subpart FF—New Jersey

147.1550 State-administered program.

#### Subpart GG—New Mexico

147.1600 State-administered program—Class II wells.  
147.1601 State-administered program—Class I, III, IV, and V wells.

#### Subpart HH—New York

147.1650 State-administered program. [Reserved]  
147.1651 EPA-administered program.  
147.1652 Aquifer exemptions.  
147.1653 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.1654 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.  
147.1655 Requirements for wells authorized by permit.  
147.1660 EPA-administered program—Seneca Indian lands. [Reserved]

#### Subpart II—North Carolina

147.1700–147.1749 [Reserved]

#### Subpart JJ—North Dakota

147.1750 State-administered program—Class II wells.  
147.1751 State-administered program—Class I, III, IV and V wells. [Reserved]

#### Subpart KK—Ohio

147.1800 State-administered program—Class II wells.  
147.1801 State-administered program—Class I, III, IV, and V wells. [Reserved]

#### Subpart LL—Oklahoma

147.1850 State-administered program—Class I, III, IV and V wells.  
147.1851 State-administered program—Class II wells.

#### Subpart MM—Oregon

147.1900–147.1949 [Reserved]

#### Subpart NN—Pennsylvania

147.1950 State-administered program. [Reserved]  
147.1951 EPA-administered program.  
147.1952 Aquifer exemptions.  
147.1953 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.  
147.1954 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.



147.1955 Requirements for wells authorized by permit.

#### Subpart OO—Rhode Island

147.2000-147.2049 [Reserved]

#### Subpart PP—South Carolina

147.2050-147.2099 [Reserved]

#### Subpart QQ—South Dakota

147.2100-147.2149 [Reserved]

#### Subpart RR—Tennessee

147.2150 State-administered program. [Reserved]

147.2151 EPA-administered program.

147.2152 Aquifer exemptions. [Reserved]

147.2153 Existing Class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.

147.2154 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.

147.2155 Requirements for all wells.

#### Subpart SS—Texas

147.2200 State-administered program—Class I, III, IV, and V wells.

147.2201 State-administered program—Class II wells.

#### Subpart TT—Utah

147.2250 State-administered program—Class I, III, IV, and V wells.

147.2251 State-administered program—Class II wells.

#### Subpart UU—Vermont

147.2300-147.2349 [Reserved]

#### Subpart VV—Virginia

147.2350 State-administered program. [Reserved]

147.2351 EPA-administered program.

147.2352 Aquifer exemptions. [Reserved]

#### Subpart WW—Washington

147.2400-147.2449 [Reserved]

#### Subpart XX—West Virginia

147.2450-147.2499 [Reserved]

#### Subpart YY—Wisconsin

147.2500 State-administered program.

#### Subpart ZZ—Wyoming

147.2550 State-administered program—Class I, III, IV, and V wells.

147.2551 State-administered program—Class II wells.

#### Subpart AAA—Guam

147.2600 State-administered program.

#### Subpart BBB—Puerto Rico

147.2650-147.2699 [Reserved]

#### Subpart CCC—Virgin Islands

147.147.2700-147.2749 [Reserved]

#### Subpart DDD—American Samoa

147.2750 State-administered program. [Reserved]

147.2751 EPA-administered program.

147.2752 Aquifer exemptions. [Reserved]

#### Subpart EEE—Commonwealth of the Northern Mariana Islands

147.2800 State-administered program. [Reserved]

147.2801 EPA-administered program.

147.2802 Aquifer exemptions. [Reserved]

#### Subpart FFF—Trust Territory of the Pacific Islands

147.2850 State-administered program. [Reserved]

147.2851 EPA-administered program.

147.2852 Aquifer exemptions. [Reserved]

Authority: Sec. 1421, Pub. L. 93-523, 88 Stat. 1674, (42 U.S.C. 300h.)

#### Subpart A—General Provisions

##### § 147.1 Purpose and scope.

(a) This part sets forth the applicable Underground Injection Control (UIC) programs for each of the states, territories, and possessions identified pursuant to the Safe Drinking Water Act (SDWA) as needing a UIC program.

(b) The applicable UIC program for a State is either a State-administered program approved by EPA, or a Federally-administered program promulgated by EPA. In some cases, the UIC program may consist of a State-administered program applicable to some classes of wells and a Federally-administered program applicable to other classes of wells. Approval of a State program is based upon a determination by the Administrator that the program meets the requirements of Section 1422 or Section 1425 of the Safe Drinking Water Act and the applicable provisions of Parts 124, 144, and 146 of this chapter. A Federally-administered program is promulgated in those instances where the state has failed to submit a program for approval or where the submitted program does not meet the minimum statutory and regulatory requirements.

(c) In the case of State programs approved by EPA pursuant to Section 1422 of the SDWA, each State subpart describes the major elements of such programs, including State statutes and regulations, Statement of Legal Authority, Memorandum of Agreement, and Program Description. State statutes and regulations that contain standards, requirements, and procedures applicable to owners or operators have been incorporated by reference pursuant to regulations of the Office of the Federal Register. Material incorporated by reference is available for inspection in the appropriate EPA Regional Office, in EPA Headquarters, and at the Office of the Federal Register Information Center, Room 8301, 1100 L Street, NW, Washington, DC 20408. Other State statutes and regulations containing standards and procedures that

constitute elements of the State program but do not apply directly to owners or operators have been listed but have not been incorporated by reference.

(d) In the case of State programs promulgated under Section 1422 that are to be administered by EPA, the State subpart makes applicable the provisions of Parts 124, 144, and 146, and provides additional requirements pertinent to the specific State program.

(e) Regulatory provisions incorporated by reference (in the case of approved State programs) or promulgated by EPA (in the case of EPA-administered programs), and all permit conditions or permit denials issued pursuant to such regulations, are enforceable by the Administrator pursuant to Section 1423 of the SDWA.

(f) The information requirements located in the following sections have been cleared by the Office of Management and Budget: §§ 147.104, 147.304, 147.754, 147.904, 147.1154, 147.1354, 147.1454, 147.1654, 147.1954, and 147.2154.

The OMB clearance number is No. 2040-0042.

##### § 147.2 Severability of provisions.

The provisions in this part and the various applications thereof are distinct and severable. If any provision of this part or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or application of such provision to other persons or circumstances which can be given effect without the invalid provision or application.

#### Subpart B—Alabama

##### § 147.50 State-administered program—Class II wells.

The UIC program for Class II wells in the State of Alabama is the program administered by the State Oil and Gas Board of Alabama, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on August 2, 1982 (47 FR 33266); the effective date of this program is August 2, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Alabama. This incorporation by reference was



approved by the Director of the Federal Register on June 25, 1984.

(1) Code of Alabama 1975, §§ 9-17-1 through 9-17-110 (1980 and Supp. 1983);

(2) State Oil and Gas Board of Alabama, Oil and Gas Report 1 (supplemented) (1981), General Order Prescribing Rules and Regulations Governing the Conservation of Oil and Gas in Alabama (Order No. 76-100) as amended by Board Order No. 82-96 (May 14, 1982) amending Rule E-4).

(b) The Memorandum of Agreement between EPA Region IV and the Alabama Oil and Gas Board, signed by the EPA Regional Administrator on June 15, 1982.

(c) *Statement of Legal Authority.* "State Oil and Gas Board has Authority to Carry Out Underground Injection Control Program Relating to Class II Wells as Described in Federal Safe Drinking Water Act—Opinion by Assistant Attorney General," May 28, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### § 147.51 State-administered program—Class I, III, IV and V wells

The UIC program for Class I, III, IV and V wells in the State of Alabama is the program administered by the Alabama Department of Environmental Management, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the Federal Register on August 25, 1983 (48 FR 38640); the effective date of this program is August 25, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Alabama. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Alabama Water Pollution Control Act, Code of Alabama 1975, §§ 22-22-1 through 22-22-14 (1980 and Supp. 1983);

(2) Regulations, Policies and Procedures of the Alabama Water Improvement Commission, Title I (Regulations) (Rev. December 1980), as amended May 17, 1982, to add Chapter 9, Underground Injection Control Regulations (effective June 10, 1982), as amended April 6, 1983 (effective May 11, 1983).

(b) The Memorandum of Agreement between EPA Region IV and the Alabama Department of Environment

Management, signed by the EPA Regional Administrator on May 24, 1983.

(c) *Statement of Legal Authority.* (1) "Water Pollution—Public Health—State has Authority to Carry Out Underground Injection Control Program Described in Federal Safe Drinking Water Act—Opinion by Legal Counsel for the Water Improvement Commission," June 25, 1982;

(2) Letter from Attorney, Alabama Water Improvement Commission, to Regional Administrator, EPA Region IV, "Re: AWIC Response to Phillip Tate's (U.S. EPA, Washington) Comments on AWIC's Final Application for Class I, III, IV, and V UIC Program," September 21, 1982;

(3) Letter from Alabama Chief Assistant Attorney General to Regional Counsel, EPA Region IV, "Re: Status of Independent Legal Counsel in Alabama Water Improvement Commission's Underground Injection Control Program," September 14, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart C—Alaska

##### § 147.100 State-administered program. [Reserved]

##### § 147.101 EPA-administered program.

(a) *Contents.* The UIC program for the State of Alaska is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Alaska is: June 25, 1984.

##### § 147.102 Aquifer exemptions.

(a) This section identifies any aquifers or their portions exempted in accordance with §§ 144.7(b) and 146.4 of this chapter at the time of program promulgation. EPA may in the future exempt other aquifers or portions, according to applicable procedures, without codifying such exemptions in this section. An updated list of exemptions will be maintained in the Regional office.

(b) The following aquifers are exempted in accordance with the provisions of §§ 144.7(b) and 146.4 of this chapter for Class II injection activities only:

(1) The portions of aquifers in the Kenai Peninsula, greater than the indicated depths below the ground surface, and described by a ¼ mile area

beyond and lying directly below the following oil and gas producing fields:

- (A) Swanson River Field—1700 feet.
- (B) Beaver Creek Field—1650 feet.
- (C) Kenai Gas Field—1300 feet.

(2) The portion of aquifers beneath Cook Inlet described by a ¼ mile area beyond and lying directly below the following oil and gas producing fields:

- (A) Granite Point.
- (B) McArthur River Field.
- (C) Middle Ground Shoal Field.
- (D) Trading Bay Field.

(3) The portions of aquifers on the North Slope described by a ¼ mile area beyond and lying directly below the Kuparuk River Unit oil and gas producing field.

##### § 147.103 Existing class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule

Maximum injection pressure. The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g)d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of inject fluid (unitless)

$d$  = injection depth in feet.

##### § 147.104 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish maximum injection pressures after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and



(B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressure based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within 1 year of the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)–(3) as needed to protect USDWs.

## Subpart D—Arizona

### § 147.150 State-administered program. [Reserved]

### § 147.151 EPA-administered program.

The UIC program for the State of Arizona is administered by EPA.

(a) *Contents.* The UIC program that applies to all injection activities in Arizona, except those on lands of the Navajo Indian Tribe, consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Arizona is: June 25, 1984.

### § 147.152 Aquifer exemptions. [Reserved]

## Subpart E—Arkansas

### § 147.200 State-administered program—Class I, III, IV and V wells.

The UIC program for Class I, III, IV and V wells in the State of Arkansas is the program administered by the Arkansas Department of Pollution Control and Ecology, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the *Federal Register* on July 6, 1982 (47 FR 29236); the effective date of this program is July 6, 1982. This program consists of the following elements, as submitted to EPA in the State's program application.

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Arkansas. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Arkansas Water and Air Pollution Control Act, Act 472 of 1949 as amended, Arkansas Statutes Annotated §§ 82-1901 through 82-1943 (1976);

(2) Act 105 of 1939, Arkansas Statutes Annotated §§ 53-101 through 53-130 (1971 and Supp. 1981); Act 937 of 1979, Arkansas Statutes Annotated §§ 53-1301 through 53-1320 (Supp. 1981); Act 523 of 1981;

(3) Arkansas Underground Injection Control Code, Department of Pollution Control and Ecology, promulgated January 22, 1982;

(4) General Rule and Regulations, Arkansas Oil and Gas Commission (Order No. 2-39, revised July 1972);

(5) Arkansas Hazardous Waste Management Code, Department of

Pollution Control and Ecology, promulgated August 21, 1981.

(b) The Memorandum of Agreement and Addendum No. 1 to the Memorandum of Agreement, between EPA Region VI and the Arkansas Department of Pollution Control and Ecology and the Arkansas Oil and Gas Commission, signed by the EPA Regional Administrator on May 25, 1982.

(c) *Statement of Legal Authority.* (1) Letter from Chief Attorney, Arkansas Department of Pollution Control and Ecology, to Acting Regional Administrator, EPA Region VI, "Re: Legal Authority of the Department of Pollution Control and Ecology of the State of Arkansas to Administer an Underground Injection Control Program," July 29, 1981;

(2) Letter from Chief Attorney, Arkansas Department of Pollution Control and Ecology, to Acting Regional Counsel, EPA Region VI, "Re: Addendum to Legal Statement—Underground Injection Control Program," October 13, 1981;

(3) Letter from General Counsel, Arkansas Oil and Gas Commission, to Acting Regional Counsel, EPA Region VI, "Re: Supplemental Addendum to Legal Statement—Underground Injection Control Program," October 20, 1981;

(4) Letter from Chief Attorney, Arkansas Department of Pollution Control and Ecology, to Attorney, Office of Regional Counsel, EPA Region VI (re: status as independent legal counsel), December 31, 1981;

(5) Letter from General Counsel, Arkansas Oil and Gas Commission, to Acting Regional Counsel, EPA Region VI, "Re: Supplemental Addendum to Legal Statement—Underground Injection Control Program," January 13, 1982;

(6) Letter from Chief Counsel, Arkansas Department of Pollution Control and Ecology, to Acting Regional Counsel, EPA Region VI, "Re: Addendum to Legal Statement—Underground Injection Control Program," February 15, 1982;

(7) Letter from Chief Counsel, Arkansas Department of Pollution Control and Ecology, to Acting Regional Counsel, EPA Region VI, "Re: Addendum to Legal Statement—Underground Injection Control Program," May 13, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.



**§ 147.201 State-administered program—Class II wells. [Reserved]**

**SUBPART F—CALIFORNIA**

**§ 147.250 State-administered program—Class II wells.**

The UIC program for Class II wells in the State of California is the program administered by the California Division of Oil and Gas, approved by EPA pursuant to SDWA Section 1425. Notice of this approval was published in the Federal Register on February 11, 1983 (48 FR 6336); the effective date of this program is March 14, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of California. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) California Public Resources Code §§ 3000-3359 (West 1972 and Supp. 1984);

(2) California Administrative Code, title 14, §§ 1710-1724.10 (1980)

(b) The Memorandum of Agreement between EPA Region IX and the California Division of Oil and Gas, signed by the EPA Regional Administrator on September 29, 1982.

(c) *Statement of Legal Authority.* (1) Letter from California Deputy Attorney General to the Administrator of EPA, "Re: Legal Authority of California Division of Oil and Gas to Carry Out Class II Injection Well Program," April 1, 1981;

(2) Letter from California Deputy Attorney General to Chief of California Branch, EPA Region IX, "Re: California Application for Primacy, Class II UIC Program," December 3, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

**§ 147.251 EPA-administered program—Class I, III, IV and V wells.**

(a) *Contents.* The UIC program for the State of California is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for California is: June 25, 1984.

**§ 147.252 Aquifer exemptions. [Reserved]**

**§ 147.253 Existing Class I, II (Except Enhanced Recovery and Hydrocarbon Storage) and III Wells Authorized by Rule.**

Maximum injection pressure. The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g) d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of inject fluid (unitless)

$d$  = injection depth in feet.

**Subpart G—Colorado**

**§ 147.300 State-administered program. [Reserved]**

**§ 147.301 EPA-administered program—Class I, III, IV, and V wells.**

The UIC program in the State of Colorado for Class I, III, IV, and V wells, and for Class II wells on all Indian lands other than those of the Ute Mountain Reservation, is administered by EPA.

(a) *Contents.* This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC Program for Colorado is: June 25, 1984.

**§ 147.302 Aquifer exemptions.**

(a) This section identifies any aquifers of their portions exempted in accordance with §§ 144.7(b) and 146.4 of this chapter at the time of program promulgation. EPA may in the future exempt other aquifers or portions according to applicable procedures without codifying such exemptions in this section. An updated list of exemptions will be maintained in the Regional office.

(b) For all aquifers into which existing Class II wells are injecting, those portions within a ¼ mile radius of the well are exempted for the purpose of Class II injection activities only.

**§ 147.303 Existing class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.**

Maximum injection pressure. The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for wellhead pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g) d$$

where:

$P_m$  = injection pressure at the wellhead in pounds per square inch

$S_g$  = specific gravity of injected fluid (unitless)

$d$  = injection depth in feet.

**§ 147.304 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule.**

(a) *Maximum injection pressure.* (1) To meet the operating requirements of § 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirements of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this Chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressures based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within one year of the effective date of this program.



(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

- (1) Protect USDWs by:
  - (i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or
  - (ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and
  - (2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and
  - (3) Use cement:
    - (i) Of sufficient quantity and quality to withstand the maximum operating pressure;
    - (ii) Which is resistant to deterioration from formation and injection fluids; and
    - (iii) In quantity no less than 120% of the calculated volume necessary to cement off a zone.
  - (4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)–(3) as needed to protect USDWs.

#### § 147.305 Requirements for all wells.

(a) The owner or operator converting an existing well to an injection well shall check the condition of the casing with one of the following logging tools:

- (1) A Pipe analysis log; or
- (2) A Caliper log.
- (b) The owner or operator of a new injection well cased with plastic (PVC, ABS, and others) casings shall:
  - (1) Not construct a well deeper than 500 feet;
  - (2) Use cement and additives compatible with such casing material;
  - (3) Cement the annular space above the injection interval from the bottom of the blank casing to the surface.
  - (c) The owner or operator of a newly drilled well shall install centralizers as directed by the Regional Administrator.
  - (d) The owner or operator shall as required by the Regional Administrator:
    - (1) Protect USDWs by:
      - (i) Setting surface casing 50 feet below the base of the lowermost USDW;
      - (ii) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(iii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may approve alternate casing and cementing practices provided that the owner or operator demonstrates that such practices will adequately protect USDWs.

(e) *Area of review.* Notwithstanding the alternatives presented in § 146.6 of this Chapter, the area of review shall be a fixed radius as described in § 146.6(b) of this chapter.

(f) The applicant must give separate notice of intent to apply for a permit to each owner or tenant of the land within one-quarter mile of the site. The addresses of those to whom notice is given, and a description of how notice is given, shall be submitted with the permit application. The notice shall include:

- (1) Name and address of applicant;
- (2) A brief description of the planned injection activities, including well location, name and depth of the injection zone, maximum injection pressure and volume, and fluid to be injected;
- (3) EPA contact person; and
- (4) A statement that opportunity to comment will be announced after EPA prepares a draft permit. This requirement may be waived by the Regional Administrator when he determines that individual notice to all land owners and tenants would be impractical.

#### Subpart H—Connecticut

§§ 147.350–147.359 [Reserved]

#### Subpart I—Delaware

§§ 147.400–147.449 [Reserved]

#### Subpart J—District of Columbia

§ 147.450 State-administered program. [Reserved]

§ 147.451 EPA-administered program.

(a) *Contents.* The UIC program for the District of Columbia is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts

124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for the District of Columbia is: June 25, 1984.

§ 147.452 Aquifer exemptions. [Reserved]

#### Subpart K—Florida

§ 147.500 State-administered program—Class I, III, IV, and V wells.

The UIC program for Class I, III, IV, and V wells in the State of Florida is the program administered by the Florida Department of Environmental Regulation, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the *Federal Register* on February 7, 1983 (48 FR 5556); the effective date of this program is March 9, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Florida. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Florida Air and Water Pollution Control Act, Florida Statutes Annotated §§ 403.011–403.90 (1973 and Supp. 1983);

(2) Chapters 17–28, Underground Injection Control, Florida Administrative Code §§ 17–28.11 through 17–28.64 (Supp. 1982).

(b) *Other Laws.* The following statutes and regulations although not incorporated by reference, also are part of the approved State-administered program:

(1) Administrative Procedures Act, Florida Statutes Chapter 120;

(2) Florida Administrative Code, Chapter 17–1 (1982) (Administrative Procedures Act);

(3) Florida Administrative Code, Chapter 17–3 (1982) (Water Quality Standards);

(4) Florida Administrative Code, Chapter 17–4 (1982) (Permits);

(5) Florida Administrative Code, Chapter 28–5 (1982) (Decisions Determining Substantial Interests);

(6) Florida Administrative Code, Chapter 28–6 (1982) (Licensing);

(c) The Memorandum of Agreement between EPA Region IV and the Florida Department of Environmental



Regulation, signed by the EPA Regional Administrator on March 31, 1983.

(d) *Statement of Legal Authority.* (1) "Statement of Legal Authority for Implementation of Underground Injection Control Program" and accompanying certifications, signed by General Counsel for the Florida Department of Environmental Regulation, January 14, 1982;

(2) "Addendum to Statement of Legal Authority for Implementation of Underground Injection Control Program" and accompanying certifications, signed by Acting General Counsel for the Florida Department of Environmental Regulation, September 20, 1982.

(a) The Program Description and any other materials submitted as part of the original application or as supplements thereto.

**§ 147.501 State-administered program—Class II wells. [Reserved]**

#### Subpart L—Georgia

**§§ 147.550–147.559 [Reserved]**

#### Subpart M—Hawaii

**§§ 147.600–147.649 [Reserved]**

#### Subpart N—Idaho

**§ 147.650 State-administered program. [Reserved]**

**§ 147.651 EPA-administered program.**

(a) *Contents.* The UIC program for the State of Idaho is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Idaho is: June 11, 1984.

**§ 147.652 Aquifer exemptions. [Reserved]**

#### Subpart O—Illinois

**§ 147.700 State-administered program—Class I, III, IV, and V wells.**

The UIC program for Class I, III, IV, and V wells in the State of Illinois is the program administered by the Illinois Environmental Protection Agency, approved by EPA pursuant to Section 1422 of the SDWA. Notice of the approval was published in the *Federal Register* on February 1, 1984 (49 FR 3991); the effective date of this program is March 3, 1984. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the state statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Illinois. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Illinois Environmental Protection Act, Illinois ch. 111½, §§ 1001–1051 (Smith-Hurd 1977 Revised Statutes and Supp. 1983), as amended by Public Act No. 83–431, 1983 Illinois Legislative Service, pages 2910–2916 (West);

(2) Illinois Pollution Control Board Rules and Regulations at Title 35, Illinois Administrative Code, Chapter I, Part 700, Outline of Waste Disposal Regulations; Part 702, RCRA and UIC Permit Programs; Part 704, UIC Permit Program; Part 705, Procedures for Permit Issuance and Part 730, Underground Injection Control Operating Requirements as amended by IPCB Order No. R-83039 on December 15, 1983.

(b) The Memorandum of Agreement between EPA Region V and the Illinois Environmental Protection Agency, signed by the EPA Regional Administrator on March 22, 1984.

(c) *Statement of Legal Authority.* Letter from Illinois Attorney General to Regional Administrator, EPA Region V, and attached statement, December 16, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

**§ 147.701 State-administered program—Class II wells.**

The UIC program for Class II wells in the State of Illinois is the program administered by the Illinois Department of Mines and Minerals, approved by EPA pursuant to Section 1425 of the SDWA for the State of Illinois. Notice of the approval was published in the *Federal Register* on February 1, 1984 (49 FR 3990); the effective date of this program is March 3, 1984. This program consists of the following elements, as submitted to EPA in the state's program application:

(a) *Incorporation by reference.* The requirements set forth in the State Statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Illinois. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Conservation of Oil and Gas, etc., Illinois Revised Statutes ch. 96½,

§§ 5401–5457 (Smith-Hurd 1979 and Supp. 1983), as amended by Public Act No. 83–1074 1983 Illinois Legislative Service pages 7183–7185 (West);

(2) Illinois Environmental Protection Act, Illinois Revised Statutes ch. 111½, §§ 1001–1051 (Smith-Hurd 1977 and Supp. 1983), as amended by Public Act No. 83–431, 1983 Illinois Legislative Service pages 2910–2916 (West);

(3) Illinois Revised Statutes ch. 100½, §§ 26 (Smith-Hurd Supp. 1983);

(4) Illinois Department of Mines and Minerals Regulations for the Oil and Gas Division, Rules I, II, IIA, III, V, VII, and IX (1981).

(b) The Memorandum of Agreement between EPA Region V and the Illinois Department of Mines and Minerals, signed by the EPA Regional Administrator on March 22, 1984.

(c) *Statement of Legal Authority.* "Certification of Legal Authority," signed by State Attorney, Richland County, Illinois, May 5, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart P—Indiana

**§ 147.750 State-administered program. [Reserved]**

**§ 147.751 EPA-administered program.**

(a) *Contents.* The UIC program for the State of Indiana is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Indiana is: June 25, 1984.

**§ 147.752 Aquifer exemptions. [Reserved]**

**§ 147.753 Existing Class I, II (Except Enhanced Recovery and Hydrocarbon Storage) and III Wells Authorized by Rule**

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.800 - 0.433 S_g) d$$

where:

$P_m$  = injection pressure at the wellhead in pounds per square inch

$S_g$  = specific gravity of injected fluid (unitless)

$d$  = injection depth in feet.



**§ 147.754 Existing Class II Enhanced Recovery and Hydrocarbon Storage Wells Authorized by Rule.**

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (i) above for the field or formation in which he is operating, provided he submits a request in writing to the Regional Administrator and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirements of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressure based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within one year of the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b)(1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)-(3) as needed to protect USDWs.

**§ 147.755 Requirements for all wells.**

(a) *Area of review.* Notwithstanding the alternatives presented in § 146.6 of this Chapter, the area of review for Class II wells shall be a fixed radius as described in § 146.6(b) of this chapter.

(b) *Tubing and packer.* The owner or operator of an injection well injecting salt water for disposal shall inject through tubing and packer. The owner or operator of an existing well must comply with this requirement within one year of the effective date of this program.

**Subpart Q—Iowa**

**§ 147.800 State-administered program. [Reserved]**

**§ 147.801 EPA-administered program.**

(a) *Contents.* The UIC program for the State of Iowa is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Iowa is: June 25, 1984.

**§ 147.802 Aquifer exemptions. [Reserved]**

**Subpart R—Kansas**

**§ 147.850 State-administered program—Classes I, III, IV, and V wells.**

The UIC program for Classes I, III, IV, and V wells in the State of Kansas is the program administered by the Kansas Department of Health and Environment,

approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the *Federal Register* on December 2, 1983 (48 FR 54350); the effective date of this program is December 2, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Kansas. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Chapter 28, Article 46, Underground Injection Control Regulations, Kansas Administrative Regulations §§ 28-46-1 through 28-46-42 (Supp. 1982), as amended May 1, 1983 (approved by the Attorney General 12-14-82), as amended (approved by the Attorney General 7-20-83);

(2) Chapter 28, Article 43, Construction, operation, monitoring and abandonment of salt solution mining wells, Kansas Administrative Regulations §§ 28-43-1 through 28-43-10 (Supp. 1982);

(3) Kansas Statutes Annotated §§ 65-161, 65-164 through 65-166a, 65-171d (1980 and Supp. 1983).

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a) of this section, are also part of the approved State-administered program:

(1) Kansas Statutes Annotated §§ 65-161 through 65-171w (1980 and Supp. 1983).

(c)(1) The Memorandum of Agreement between EPA Region VII and the Kansas Department of Health and Environment, signed by the EPA Regional Administrator on July 29, 1983;

(2) Addendum No. 1 of the Memorandum of Agreement, signed by the EPA Regional Administrator on August 29, 1983.

(d) *Statement of Legal Authority.* (1) "Statement of Attorney General," signed by Attorney General of the State of Kansas, November 25, 1981;

(2) "Supplemental Statement of the Attorney General," signed by Attorney General of the State of Kansas, undated (one page).

(e) The Program Description and any other materials submitted as part of the application or supplements thereto.



### § 147.951 State-administered program—Class II wells.

The UIC for Class II wells in the State of Kansas is the program administered by the Kansas Corporation Commission and the Kansas Department of Health and Environment, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on February 8, 1984 (49 FR 4735); the effective date of this program is February 8, 1984. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Kansas. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Kansas Statutes Annotated, Chapter 55, Articles 1, 9, and 10 (1976 and Supp. 1982);

(2) Kansas Administrative Regulations §§ 82-3-100 through 82-3-410 (effective May 1, 1983), as amended April 12, 1983 (effective July 26, 1983);

(3) Kansas Administrative Regulations, Chapter 28, Article 45, Construction, operations, monitoring and abandonment of hydrocarbon storage wells and well systems §§ 28-45-1 through 28-45-10 (Supp. 1982).

(b)(1) The Memorandum of Agreement between EPA Region VII and the Kansas Corporation Commission and the Kansas Department of Health and Environment, dated January 5, 1983;

(2) Addendum No. 1 of the Memorandum of Agreement, dated June 14, 1983;

(3) Addendum No. 2 of the Memorandum of Agreement, dated December 13, 1983.

(c) *Statement of Legal Authority.* "Class II Wells: Statement of Legal Authority," signed by General Counsel, Kansas Corporation Commission, December 13, 1983.

(d) The Program Description and any other materials submitted as part of the application or supplements thereto.

### Subpart S—Kentucky

#### § 147.900 State-administered program. [Reserved]

#### § 147.901 EPA-administered program.

(a) *Contents.* The UIC program for the Commonwealth of Kentucky is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set

forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Kentucky is: June 25, 1984.

#### § 147.902 Aquifer exemptions. [Reserved]

#### § 147.903 Existing class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable or;

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g) d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of inject fluid (unitless)

$d$  = injection depth in feet.

#### § 147.904 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule.

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressure based on data provided pursuant to paragraph

(a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within 1 year of the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between and the casing the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)–(3) as needed to protect USDWs.

#### § 147.905 Requirements for all wells—area of review.

Notwithstanding the alternatives presented in § 146.6 of this Chapter, the area of review shall be a minimum fixed radius as described in § 146.6(b) of this chapter.

### Subpart T—Louisiana

#### § 149.950 State-administered program.

The UIC program for Class I, II, III, IV, and V wells in the State of Louisiana is



the program administered by the Louisiana Department of Natural Resources, approved by EPA pursuant to Sections 1422 and 1425 of the SDWA. Notice of this approval was published in the **Federal Register** on April 23, 1982 (47 FR 17487); the effective date of this program is March 23, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Louisiana. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Louisiana Revised Statutes Annotated §§ 30:1-30:24 (1975 and Supp. 1982);

(2) Underground Injection Control Program Regulations for Class I, III, IV and V Wells, Statewide Order No. 29-N-1 (January 13, 1982);

(3)(i) Statewide Order Governing the Drilling for and Producing of Oil and Gas in the State of Louisiana, Statewide Order No. 29-B (August 26, 1974) (Composite Order Incorporating Amendments through March 1, 1974);

(ii) Amendments to Statewide Order No. 29-B (Off-site Disposal of Drilling Mud and Salt Water Generated from Drilling and Production of Oil and Gas Wells) (effective July 20, 1980);

(iii) Amendment to Statewide Order No. 29-B (Amendment concerning the use of Tables 5A and 6A, etc.) (December 15, 1980, effective January 1, 1981);

(4) (i) Statewide Order adopting rules and regulations pertaining to the use of salt dome cavities (i.e., storage chambers) for storage of liquid and/or gaseous hydrocarbons, etc., Statewide Order No. 29-M (July 6, 1977, effective July 20, 1977);

(ii) Supplement to Statewide Order No. 29-M (October 2, 1978);

(iii) Second Supplement to Statewide Order No. 29-M (June 8, 1979).

(b) (1) The Memorandum of Agreement (Class I, III, IV and V wells) between EPA Region VI and the Louisiana Department of Natural Resources, Office of Conservation, signed by the EPA Regional Administrator on March 17, 1982;

(2) The Memorandum of Agreement (Class II wells) between EPA Region VI and the Louisiana Department of Natural Resources, Office of Conservation, signed by the EPA Regional Administrator on March 17, 1982.

(c) *Statement of Legal Authority.* (1) Letter from Attorney General of Louisiana to EPA, "Re: Louisiana Underground Injection Control Program Authorization for State of Louisiana" (Class I, III, IV and V Wells), January 13, 1982, (10 pages);

(2) Letter from Attorney General of Louisiana to EPA, "Re: Louisiana Underground Injection Control Program Authorization for State of Louisiana" (Class II Wells), January 13, 1982 (5 pages).

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart U—Maine

##### § 147.1000 State-administered program.

The UIC program for Class I, II, III, IV and V wells in the State of Maine is the program administered by the Maine Department of Environmental Protection, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the **Federal Register** on August 25, 1983 (48 FR 38641); the effective date of this program is September 26, 1983. This program consists of the following elements, as submitted to EPA in the State's program application.

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Louisiana. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Maine Revised Statutes Annotated title 38, §§ 361-A, 363-B, 413, 414, 414-A, 420, and 1317-A (1978);

(2) Rules to Control the Subsurface Discharge of Pollutants by Well Injection, Rules of the Department of Environmental Protection, Chapter 543 (adopted June 22, 1983, effective July 4, 1983).

(b) The Memorandum of Agreement between EPA Region I and the Maine Department of Environmental Protection, signed by the EPA Regional Administrator on May 16, 1983.

(c) *Statement of Legal Authority.* Letter from Attorney General of Maine to EPA Regional Administrator, "Re: Attorney General's Statement: Maine Underground Injection Control Program Primacy Application," June 30, 1983.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart V—Maryland

##### §§ 147.1050-147.1099 [Reserved]

#### Subpart W—Massachusetts

##### § 147.1100 State-administered program.

The UIC program for Class I, II, III, IV and V wells in the State of Massachusetts is the program administered by the Massachusetts Department of Environmental Quality Engineering, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the **Federal Register** on November 23, 1982 (47 FR 52705); the effective date of this program is December 23, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Massachusetts. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Massachusetts General Laws Annotated ch. 21, §§ 27, 43, and 44 (West 1981);

(2) Code of Massachusetts Regulations, title 310, §§ 23.01-23.11 as amended April 26, 1982.

(b) The Memorandum of Agreement between EPA Region I and the Massachusetts Department of Environmental Quality Engineering, signed by the EPA Regional Administrator on August 18, 1982.

(c) *Statement of Legal Authority.* "Underground Injection Control Program—Attorney General's Statement for Class I, II, III, IV and V Injection Wells," signed by Assistant Attorney General for Attorney General of Massachusetts, May 13, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart X—Michigan

##### § 147.1150 State-administered program. [Reserved]

##### § 147.1151 EPA-administered program.

(a) *Contents.* The UIC program for the State of Michigan is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.



(b) *Effective date.* The effective date of the UIC program for Michigan is: June 25, 1984.

**§ 147.1152 Aquifer exemptions.**  
[Reserved]

**§ 147.1153 Existing class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.**

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.800 - 0.433 S_g)d$$

where

$P_m$  = injection pressure at the well head in

pounds per square inch

$S_g$  = specific gravity of injected fluid (unitless)

$d$  = injection depth in feet.

**§ 147.1154 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule.**

(a) *Maximum injection pressure.*

(1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes field rules for maximum injection pressure based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within 1 year following the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)-(3) as needed to protect USDWs.

**§ 147.1155 Requirements for all wells.**

(a) *Area of Review.* Notwithstanding the alternatives presented in § 146.6 of this Chapter, the area of review for Class II wells shall be a fixed radius as described in § 146.6(b) of this chapter.

(b) *Tubing and packer.* The owner or operator of an injection well injecting salt water for disposal shall inject through tubing and packer. The owner of an existing well must comply with this requirement within one year of the effective date of this program.

**Subpart Y—Minnesota**

**§ 147.1200 State-administered program.**  
[Reserved]

**§ 147.1201 EPA-administered program.**

(a) *Contents.* The UIC program for the State of Minnesota is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Minnesota is: June 11, 1984.

**§ 147.1202 Aquifer exemptions.**  
[Reserved]

**Subpart Z—Mississippi**

**§ 147.1250 State-administered program—Class I, III, IV, and V wells.**

The UIC program for Class I, III, IV and V wells in the State of Mississippi is the program administered by the Mississippi Department of Natural Resources, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the *Federal Register* on August 25, 1983 (48 FR 38641); the effective date of this program is September 26, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Mississippi. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Mississippi Air and Water Pollution Control Law, Mississippi Code Annotated §§ 49-17-1 through 49-17-29 (1972) and Supp. 1983;

(2) Mississippi Department of Natural Resources, Bureau of Pollution Control, Underground Injection Control Program Regulations (adopted February 11, 1982);

(3) Mississippi Department of Natural Resources, Bureau of Pollution Control, State of Mississippi Wastewater Permit Regulations for National Pollutant Discharge Elimination System (NPDES), Underground Injection Control (UIC), and State Operating Permits (adopted May 1, 1974; amended February 11, 1982).

(b) The Memorandum of Agreement between EPA Region IV and the Mississippi Department of Natural



Resources, signed by the EPA Regional Administrator on February 8, 1983.

(c) *Statement of Legal Authority.*

(1) Letter from Attorney General of Mississippi (by Special Assistant Attorney General) to Executive Director, Mississippi Department of Natural Resources, "Re: Mississippi Department of Natural Resources, Bureau of Pollution Control, State Underground Injection Control (UIC) Program; Statement of the Attorney General of the State of Mississippi," December 3, 1981;

(2) Letter from Attorney General of Mississippi (by Special Assistant Attorney General) to Executive Director, Mississippi Department of Natural Resources, "Re: Authority to Regulate and Take Samples from Underground Injection Systems," October 18, 1982;

(3) Letter from Attorney General of Mississippi (by Special Assistant Attorney General) to Regional Administrator, EPA Region IV, "Re: Public Participation in State Enforcement Actions, UIC Program," June 10, 1983.

(d) The Program Description and any other materials submitted as part of the application or supplements thereto.

**§ 147.1251 State-administered program—Class II wells. [Reserved]**

**Subpart AA—Missouri**

**§ 147.1300 State-administered program.**

The UIC program for Class II wells in the State of Missouri is the program administered by the Missouri Department of Natural Resources, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on December 2, 1983 (48 FR 54349); the effective date of this program is December 2, 1983. This program consists of the following elements, as submitted to EPA in the State's program application.

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Missouri. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Vernon's Annotated Missouri Statutes §§ 259.010–259.240 (Supp. 1984);

(2) Missouri Code of State Regulations, title 10, division 50, Chapters 1 and 2 (§§ 50–1.010 through 50–2.120) (1982).

(b) The Memorandum of Agreement between EPA Region VII and the Missouri Department of Oil and Gas,

signed by the EPA Regional Administrator on December 3, 1982.

(c) *Statement of Legal Authority.* (1) *Opinion Letter No. 63 and attached Memorandum Opinion, signed by Attorney General of Missouri, March 16, 1982;*

(2) Addendum to Opinion Letter No. 63 (1982), signed by Attorney General of Missouri, October 28, 1982.

(3) Opinion No. 127–83, signed by Attorney General of Missouri, July 11, 1983.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

**§ 147.1301 EPA-administered program—Class I, III, IV, and V wells.**

(a) *Contents.* The UIC program for the State of Missouri is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Missouri is: June 25, 1984.

**§ 147.1302 Aquifer exemptions. [Reserved]**

**Subpart BB—Montana**

**§ 147.1350 State-administered program. [Reserved]**

**§ 147.1351 EPA-administered program.**

(a) *Contents.* The UIC program for the State of Montana is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Montana is: June 25, 1984.

**§ 147.1352 Aquifer exemptions.**

Those portions of aquifers within one-quarter mile of existing Class II wells are exempted for the purpose of Class II injection activities only.

**Note.**—A complete listing of the exemptions and their location is available for review in the EPA Regional Office, 1860 Lincoln Street, Denver, Colorado. An updated list of exemptions will be maintained in the Regional Office.

**§ 147.1353 Existing Class I, II (except enhanced recovery hydrocarbon storage) and III wells authorized by rule.**

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g) d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of inject fluid (unitless)

$d$  = injection depth in feet.

**§ 147.1354 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule.**

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this Chapter.

(2) Prior to such time as the Regional Administrator established rules for maximum injection pressure based on data provided pursuant to paragraph (ii) below the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two



or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within 1 year of the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall when required by the Regional Administrator:

(1) Isolate all USDWs by placing cement between the outermost casing and the well bore as follows:

(i) If the injection well is east of the 108th meridian, cement the outermost casing from a point 50 feet into a major shale formation underlying the uppermost USDW to the surface. For the purpose of this paragraph, major shale formations are defined as the Bearpaw, Clagget, and Colorado formations.

(ii) If the injection well is west of the 108th meridian, cement the outermost casing to a depth of 1,000 feet, or to the base of the lowermost USDW in use as a source of drinking water whichever is deeper. The Regional Administrator may allow an owner or operator to cement to a lesser depth if he can demonstrate to the satisfaction of the Regional Administrator that no USDW will be affected by the injection facilities.

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)–(3) as needed to protect USDWs.

#### § 147.1355 Requirements for all wells.

(a) *Area of review.* Notwithstanding the alternatives presented in § 146.6 of this chapter, the area of review shall be a fixed radius as described in § 146.06(b) of this chapter.

(b) The applicant must give separate notice of intent to apply for a permit to each owner or tenant of the land within one-quarter mile of the site. This requirement may be waived by the

Regional Administrator where individual notice to all land owners and tenants would be impractical. The addresses of those to whom notice is given, and a description of how notice was given, shall be submitted with the permit application. The notice shall include:

(1) Name and address of applicant;

(2) A brief description of the planned injection activities, including well location, name and depth of the injection zone, maximum injection pressure and volume, and fluid to be injected;

(3) EPA contact person; and

(4) A statement that opportunity to comment will be announced after EPA prepares a draft permit.

(c) Owners and operators on or within one-half mile of Indian lands shall provide notice as specified in paragraph (b) of this section, except that such notice shall be provided within a one-half mile radius of the site.

#### Subpart CC—Nebraska

##### § 147.1400 State-administered program—Class II wells.

The UIC program for Class II wells in the State of Nebraska is the program administered by the Nebraska Oil and Gas Conservation Commission, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on February 3, 1983 (48 FR 4777); the effective date of this program is February 3, 1983. This program consists of the following elements:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Nebraska. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Rules and Regulations of the Nebraska Oil and Gas Conservation Commission, Rules 1–6 (as published by the Commission, May 1981);

(2) Nebraska Revised Statutes §§ 57–903, 57–906 (Reissue 1978).

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a) of this section, are also part of the approved state-administered program:

(1) Chapter 57, Oil and Gas Conservation, Nebraska Revised Statutes §§ 57–901 through 57–922 (Reissue 1978).

(c) The Memorandum of Agreement between EPA Region VII and the

Nebraska Oil and Gas Conservation Commission, signed by the EPA Regional Administrator on July 12, 1982.

(d) *Statement of Legal Authority.* (1) "Nebraska Underground Injection Control Program, Attorney General's Statement for Class II Wells," signed by Assistant Attorney General for Attorney General of Nebraska, as submitted with "State of Nebraska Request for Administration of UIC Program," January 23, 1982;

(2) "Re: Nebraska Underground Injection Control Program, Addendum to Attorney General's Statement for Class II Wells," signed by Assistant Attorney General for Attorney General of Nebraska, undated.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.

##### § 147.1401 EPA-administered program—Class I, III, IV and V wells.

(a) *Contents.* The UIC program for the State of Nebraska is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Nebraska is: June 25, 1984.

##### § 147.1402 Aquifer exemptions. [Reserved]

#### Subpart DD—Nevada

##### § 147.1450 State-administered program. [Reserved]

##### § 147.1451 EPA-administered program.

(a) *Contents.* The UIC program for the State of Nevada is administered by EPA. This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Nevada is: June 25, 1984.

##### § 147.1452 Aquifer exemptions.

(a) This section identifies any aquifers or their portions exempted in accordance with §§ 144.7(b) and 146.4 of this chapter at the time of program promulgation. EPA may in the future exempt other aquifers or portions, according to applicable procedures, without codifying such exemptions in this section. An updated list of



exemptions will be maintained in the Regional office.

(b) The following proven oil-bearing portions of the Railroad Valley aquifer in Nye County, Nevada, are exempted, in accordance with the provisions of §§ 144.7(b) and 146.4 of this chapter, for Class II injection activities only.

(1) One-quarter mile radius around the following wells in the Eagle Springs Field:

(i) John Lyndon #1, S35, T9N, R57E.  
(ii) Draycutt Corporation #45, S36, T9N, R57E.

(2) One-quarter mile radius around the following wells in the Trap Spring Field.

(i) Northwest Exploration Co., Trap Spring #13, S26, T9N, R56E.  
(ii) Northwest Exploration Co., Trap Spring #20X, S22, T9N, R56E.  
(iii) Chadco Munson Ranch, #24-1, S24, T9N, R56E.

**§ 147.1453 Existing Class I, II (Except Enhanced Recovery and Hydrocarbon Storage) and III Wells Authorized by Rule.**

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for well head pressure calculated by using the formula:

$$P_m = (0.733 - 0.433 S_g) d$$

where

$P_m$  = injection pressure at the wellhead in pounds per square inch

$S_g$  = specific gravity of injected fluid (unitless)

$d$  = injection depth in feet.

**§ 147.1454 Existing Class II Enhanced Recovery and Hydrocarbon Storage Wells Authorized by Rule.**

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the

Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes field rules for maximum injection pressure based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within one year following the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (1)–(3) as needed to protect USDWs.

**Subpart EE—New Hampshire**

**§ 147.1500 State-administered program.**

The UIC program for Class I, II, III, IV and V wells in the State of New Hampshire is the program administered by the New Hampshire Water Supply and Pollution Control Commission, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the Federal Register on September 21, 1982 (47 FR 41561); the effective date of this program is October 21, 1982. This program consists of the following elements:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of New Hampshire. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) New Hampshire Revised Statutes Annotated § 149:8 III(a) (1978);

(2) New Hampshire Code of Administrative Rules, Part Wc 410 (Protection of Groundwaters of the State, §§ Ws 410.1 through Ws 410.16) (Issue Ws 3–82).

(b)(1) The Memorandum of Agreement between EPA Region I and the New Hampshire Water Supply and Pollution Control Commission, signed by the EPA Regional Administrator on August 23, 1982;

(2) Amendment No. 1 to the Memorandum of Agreement, signed by the EPA Regional Administrator on July 18, 1982.

(c) *Statement of Legal Authority.* (1) Letter from Attorney General of New Hampshire to Regional Administrator, EPA Region I, "Re: Attorney General's Statement—Underground Injection Control Program," March 23, 1982;

(2) Letter from Attorney General of New Hampshire to Regional Administrator, EPA Region I, "Re: Attorney General's Statement—Underground Injection Control Program," July 1, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

**Subpart FF—New Jersey**

**§ 147.1550 State-administered program.**

The UIC program for Class I, II, III, IV, and V wells in the State of New Jersey is the program administered by the New Jersey Department of Environmental Protection, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the



Federal Register on July 15, 1983 (48 FR 32343); the effective date of this program is August 15, 1983. This program consists of the following elements, as submitted to EPA in the State's program application.

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of New Jersey. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Water Pollution Control Act, New Jersey Statutes Annotated §§58:10A-1 through 58:10A-14 (1982);

(2) Regulations Concerning the New Jersey Pollutant Discharge Elimination System, New Jersey Administrative Code §§ 7:14A-1.1 through -1.10 (subchapter 1), 7:14A-2.1 through 2.15 (subchapter 2), 7:14A-5.1 through -5.18 (subchapter 5), and 7:14A-10.13 (as published by the State of New Jersey Department of Environmental Protection, March 1981).

(b)(1) The Memorandum of Agreement between EPA Region II and the New Jersey Department of Environmental Protection, signed by the EPA Regional Administrator on September 9, 1982;

(2) Letter from Commissioner, New Jersey Department of Environmental Protection, to Regional Administrator, EPA Region II, March 21, 1983.

(c) *Statement of Legal Authority.* (1) Letter from Attorney General of New Jersey (by Deputy Attorney General) to Commissioner, Department of Environmental Protection, "Re: New Jersey Pollutant Discharge Elimination System—Underground Injection Control," February 9, 1982;

(2) Letter from Attorney General of New Jersey (by Deputy Attorney General) to Commissioner, Department of Environmental Protection, "Re: New Jersey Pollutant Discharge Elimination System—Underground Injection Control," April 15, 1983 (six pages);

(3) Letter from Attorney General of New Jersey (by Assistant Attorney General) to Commissioner, Department of Environmental Protection, "Re: New Jersey Pollutant Discharge Elimination System—Underground Injection Control," April 15, 1983 (two pages).

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

## Subpart GG—New Mexico

### § 147.1600 State-administered program—Class II wells.

The UCI program for Class II wells in the State of New Mexico is the program administered by the New Mexico Energy and Minerals Department, Oil Conservation Division, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on February 5, 1982 (47 FR 5412); the effective date of this program is March 7, 1982. This program consists of the following elements as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of New Mexico. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Oil and Gas Act, New Mexico Statutes Annotated §§ 70-2-1 through -36 (1978);

(2) *State of New Mexico Energy and Mineral Department, Oil Conservation Division—Rules and Regulations* (dated 10-1-78), §§ B-3, I-701 through I-708, M-1100 through M-1121.

(b)(1) The Memorandum of Agreement between EPA Region VI and the New Mexico Energy and Minerals Department, Oil Conservation Division, signed by the EPA Regional Administrator on December 10, 1981;

(2) Addendum No. 1 to the Memorandum of Agreement, signed by the EPA Regional Administrator on June 28, 1982;

(3) Addendum No. 2 to the Memorandum of Agreement, signed by the EPA Regional Administrator on November 18, 1982;

(4) Letter from Director, Oil Conservation Division, New Mexico Energy and Minerals Department, and Assistant Attorney General of New Mexico, to Regional Administrator, EPA Region VI, November 6, 1981.

(c) *Statement of Legal Authority.* "Statement of Legal Authority of the State of New Mexico by and through its Oil Conservation Division of the Energy and Mines Department to conduct an Underground Injection Control Program," signed by Assistant Attorney General and General Counsel to the Oil Conservation Division.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

### § 147.1601 State-administered program—Class I, III, IV and V wells.

The UIC program for Class I, III, IV and V injection wells in the State of New Mexico is the program administered by the New Mexico Water Quality Control Commission, the Environmental Improvement Division, and the Oil Conservation Division, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the *Federal Register* on July 11, 1983 (48 FR 31640); the effective date of this program is August 10, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of New Mexico. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) New Mexico Water Quality Control Commission Regulations (WQCC 82-1) §§ 1-100 through 5-300 (September 20, 1982).

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference, are also part of the approved State-administered UIC program:

(1) Water Quality Act, New Mexico Statutes Annotated §§ 74-6-1 through 74-6-13 (1978 and Supp. 1982);

(2) Geothermal Resources Conservation Act, New Mexico Statutes Annotated §§ 71-5-1 through 71-5-24 (1978 and Supp. 1982);

(3) Surface Mining Act, New Mexico Statutes Annotated §§ 69-25A-1 through 69-25A-35 (1978 and Supp. 1980).

(c)(1) The Memorandum of Agreement between EPA Region VI and the New Mexico Water Quality Control Commission, the Environmental Improvement Division, and the Oil Conservation Division, signed by the EPA Regional Administrator on April 13, 1983;

(2) Letter from the Director, Environmental Improvement Division and the Director, Oil Conservation Division, to Regional Administrator, EPA Region IV, "Re: New Mexico Underground Injection Control Program—Clarification," February 10, 1983.

(d) *Statement of Legal Authority.* "Attorney General's Statement," signed by the Assistant Attorney General for the Environmental Improvement Division, the Assistant Attorney General



for Oil Conservation Division, and the Deputy Attorney General, Civil Division, Counsel for the Mining and Minerals Division, undated, submitted December 8, 1982.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart HH—New York

##### §147.1650 State-administered program. [Reserved]

##### §147.1651 EPA-administered program.

The UIC program for the State of New York is administered by EPA.

(a) *Contents.* The UIC program that applies to all injection activities in New York, except those on lands of the Seneca Indian Tribe, consists of the UIC program requirements in 40 CFR Parts 124, 144, and 146, and additional requirements set forth in §§ 147.1625–147.1655. Injection well owners and operators and EPA shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for New York that applies to all injection activities except those on lands of the Seneca Indian Tribe is: June 25, 1984.

(c) The UIC Program for injection activities on lands of the Seneca Indian Tribe is set forth in § 147.1660.

##### §147.1652 Aquifer exemptions.

(a) This section identifies any aquifer or their portions exempted in accordance with §§ 144.7(b) and 146.4 of this chapter at the time of program promulgation. EPA may in the future exempt other aquifers or portions, according to applicable procedures, without codifying such exemptions in this section. An updated list of exemptions will be maintained in the Regional office.

(b) The following portions of aquifers are exempted in accordance with the provisions of §144.7(b) and § 146.4 of this Chapter for Class II injection activities only:

(1) The Bradford First, Second, and Third Sand Members and the Kane Sand Member in the Bradford Field in Cattaraugus County.

(2) The Chipmunk Oil field in Cattaraugus County.

##### §147.1653 Existing Class I, II (Except Enhanced Recovery and Hydrocarbon Storage) and III Wells Authorized by Rule.

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable; or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g)d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of inject fluid (unitless)

$d$  = injection depth in feet.

##### § 147.1654 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule.

###### (a) Maximum injection pressure.

(1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure, or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressure based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within one year of the effective date of this program.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(iii) For wells as described in § 146.8(b)(3)(ii), installing a smaller diameter pipe inside the existing injection tubing and setting it on an appropriate packer; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 50 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (b)(1)–(3) of this section as needed to protect USDWs.

##### § 147.1655 Requirements for wells authorized by permit.

(a) The owner or operator of a Class I well authorized by permit shall install or shall ensure that the well has:

(1) Surface casing present;

(i) Extending from the surface to a depth at least 50 feet below the base of the lowermost USDW; and

(ii) Cemented back to the surface by recirculating the cement; and

(2) Long string casing and tubing;

(i) Extending to the injection zone; and

(ii) Cemented back to 50 feet above the base of the next largest casing string.

(b) The owner or operator of a new Class II well authorized by permit shall:

(1) Install surface casing from the surface to at least 50 feet below the base of the lowermost USDW.

(2) Cement the casing by recirculating to the surface or by using no less than 120% of the calculated annular volume.



(3) For new enhanced recovery wells, install tubing or long string casing extending to the injection zone.

(4) For new salt water disposal wells, install long string casing and tubing extending to the injection zone.

(5) Isolate any injection zone by placing sufficient cement to fill the calculated volume to a point 50 feet above the injection zone.

(c) The Regional Administrator may specify casing and cementing requirements other than those listed in paragraphs (a) and (b) of this section on a case by case basis as conditions of the permit.

**§ 147.1660 EPA-administered program—Seneca Indian lands. [Reserved]**

**Subpart II—North Carolina**

**§§ 147.1700–147.1749 [Reserved]**

**Subpart JJ—North Dakota**

**§ 147.1750 State-administered program—Class II wells.**

The UIC program for Class II wells in the State of North Dakota is the program administered by the North Dakota Industrial Commission, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on August 23, 1983 (48 FR 38237); the effective date of this program is September 24, 1983. This program consists of the following elements, as submitted to EPA in the State's program application.

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of North Dakota. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) North Dakota Century Code §§ 38-08–05 (Supp. 1983);

(2) North Dakota Administrative Code, Chapter 43-02-05 (Underground Injection Control, §§ 43-02-05-01 through -14 as published in *Statutes and Rules for the Conservation of Oil and Gas*, North Dakota Industrial Commission, January 1, 1983);

(b) The Memorandum of Agreement between EPA Region VIII and the North Dakota Industrial Commission, Oil and Gas Division, signed by the EPA Regional Administrator on June 16, 1983.

(c) *Statement of Legal Authority.* "Underground Injection Control Program Attorney General's Statement," as submitted with the North Dakota Underground Injection Control Program

Primacy Application for Class II Injection Wells, transmitted by the Governor on July 15, 1982 (16 pages).

(d) The Program Description and other materials submitted as part of the application or as supplements thereto.

**§ 147.1751 State-administered program—Class I, III, IV and V wells. [Reserved]**

**Subpart KK—Ohio**

**§ 147.1800 State-administered program—Class II wells.**

The UIC program for Class II wells in the State of Ohio is the program administered by the Ohio Department of Natural Resources, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on August 23, 1983 (48 FR 38238); the effective date of this program is September 22, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Ohio. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Ohio Revised Code Annotated, §§ 1509.01–1509.22 (Page 1978 and Supp. 1982);

(2) Rules of the Division of Oil and Gas, Ohio Administrative Code §§ 1501.91–01, through 1501.9–11–13 (1983).

(b) The Memorandum of Agreement between EPA Region V and the Ohio Department of Natural Resources.

(c) *Statement of Legal Authority.* "Underground Injection Control Program—Attorney General's Statement," signed by the Assistant Attorney General, Chief, Environmental Law Section, for the Attorney General of Ohio, September 30, 1982.

(d) The Program Description and any other materials submitted as part of the application or as supplements thereto.

**§ 147.1801 State-administered program—Class I, III, IV, and V wells. [Reserved]**

**Subpart LL—Oklahoma**

**§ 147.1850 State-administered program—Class I, III, IV, and V wells.**

The UIC program for Class I, III, IV, and V wells in the State of Oklahoma is the program administered by the Oklahoma State Department of Health, approved by EPA pursuant to SDWA Section 1422. Notice of this approval was published in the *Federal Register* on

June 24, 1982 (47 FR 27273). The effective date of this program is July 24, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Oklahoma. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Oklahoma Statutes title 63 §§ 1-901, 1-903 (1981);

(2) Oklahoma Controlled Industrial Waste Disposal Act, Oklahoma Statute Annotated title 63 §§ 1-2002, 1-2014 (West Supp. 1983–1984);

(3) [Regulations] [Reserved]

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a), are also part of the approved State-administered UIC program:

(1) Oklahoma Open Meeting Act, Oklahoma Statutes title 25 §§ 301–314 (Supp. 1978);

(2) Oklahoma Statutes Annotated title 63 §§ 1-101 to 1-114, 1-901 to 1-911, 1-1601 *et seq.*, 1-1701, 1-2001 to 1-2014 (West 1973 and Supp. 1982);

(3) Oklahoma Statutes Annotated title 75 §§ 301–327 (West 1976 and Supp. 1982).

(c) (1) The Memorandum of Agreement between EPA Region VI and the Oklahoma State Department of Health, signed by the EPA Regional Administrator on April 13, 1982;

(2) Memorandum of Understanding between the Oklahoma State Department of Health and the Oklahoma Corporation Commission (OCC), signed by members of the OCC on February 12, 1982;

(3) Memorandum of Understanding between the Oklahoma State Department of Health and the Oklahoma Department of Mines (ODM), signed by the Deputy Chief Mine Inspector, ODM, on February 15, 1982.

(d) *Statement of Legal Authority.* Letter from Attorney General of Oklahoma to Commissioner of Health, Oklahoma State Department of Health, "Re: Statement and Memorandum of Law Concerning the Authority for the Oklahoma State Department of Health's Underground Injection Control Program," February 12, 1982.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.



**§ 147.1851 State-administered program—Class II wells.**

The UIC program for Class II wells in the State of Oklahoma is the program administered by the Oklahoma Corporation Commission, approved by EPA pursuant to SDWA Section 1425. Notice of this approval was published in the *Federal Register* on December 2, 1981 (46 FR 58588). This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.*  
[Reserved]

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference, are also part of the approved State-administered UIC program:

(1) Oklahoma Statutes, title 17 §§51-53; title 52 §§ 86.1-86.5, 139-153, 243, 307-318.1 (1971).

(2) OCC-OGR Rules No. 1-101-3-303.

(c) (1) The Memorandum of Agreement between EPA Region VI and the Oklahoma Corporation Commission, signed by the EPA Regional Administrator on April 13, 1981;

(2) Letter from the Manager, Underground Injection Control, Oklahoma Corporation Commission, to EPA, June 18, 1981.

(d) *Statement of Legal Authority.* "Statement of Legal Authority of the Oklahoma Corporation Commission to Conduct an Underground Injection Control Program," (Part IV, pages 30-41 of "State of Oklahoma Primacy Application for Authority to Regulate Class II Injection Wells," submitted April 14, 1981), signed by the Conservation Attorney, Counsel to the Director and the Oklahoma Corporation Commission.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.

**Subpart MM—Oregon**

§§ 147.1900-147.1949 [Reserved]

**Subpart NN—Pennsylvania**

§ 147.1950 State-administered program.  
[Reserved]

§ 147.1951 EPA-administered program.

(a) *Contents.* The UIC program for the State of Pennsylvania is administered by EPA. (This program consists of the UIC program requirements for 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.)

(b) *Effective date.* The effective date of the UIC program for Pennsylvania is: June 25, 1984.

**§ 147.1952 Aquifer exemptions.**

(a) This section identifies any aquifers or their portions exempted in accordance with §§ 144.7(b) and 146.4 of this chapter at the time of program promulgation. EPA may in the future exempt other aquifers or portions, according to applicable procedures, without codifying such exemptions in this section. An updated list of exemptions will be maintained in the Regional office.

(b) Those portions of the following oil bearing aquifers, which would otherwise meet the definition of a USDW, are exempted in accordance with the provisions of §§ 144.7(b) and 146.4 of this Chapter for Class II enhanced recovery injection activities only.

(1) The Sugar Run and Bradford series of oil producing sands of the Bradford Field, in McKean County; including the Bradford, West Branch, Stack, Bennett Brook, Marilla Brook, Brooder Hollow, Cyclone, Minard Run, Minard Run School, and Sugar Run (or Watsonville) Pools.

(2) The Bradford Third oil producing sand of the Guffey Field in McKean County.

(3) The Bradford series of oil producing sands of the Lewis Run Field in McKean County.

(4) The Bradford series of oil producing sands of the Windfall Field and Kings Run Pool in McKean County.

(5) The Red Valley member of the Second Sand formation of the Venango Group of oil producing sands in the Foster-Reno Field in Venango County; including the Foster, Bully Hill, Victory, Bredinsburg, Egypt Corners, Reno, Monarch Park and Seneca Pools.

(6) The Glade and Clarendon oil producing sands of the Morrison Run Field and Elk Run Pool in Warren County.

(7) The Clarendon and Glade oil producing sands of the Clarendon Field in Warren County.

(8) The Bradford Third oil producing sand in the Shinglehouse Field, including the Kings Run, Janders Run and Ceres Pools in Potter and McKean Counties.

**§ 147.1953 Existing class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.**

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.733 - 0.433 S_g) d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of injection fluid (unitless)

$d$  = injection depth in feet.

**§ 147.1954 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule**

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph(a)(1)(i) of this section for the field or formation in which he is operating provided he submits a request in writing to the Regional Administrator, and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressure based on data provided pursuant to paragraph(a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The information shall be submitted to the Regional Administrator within one year of the effective date of this regulation.



(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:

(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(iii) For wells as described in § 146.8(b)(3)(ii), installing a smaller diameter pipe inside the existing injection tubing and setting it on an appropriate packer; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 50 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraphs (b)(1)-(3) of this section as needed to protect USDWs.

**§ 147.1955 Requirements for wells authorized by permit.**

(a) The owner or operator of a Class I well authorized by permit shall install or shall ensure that the well has:

(1) Surface casing present;

(i) Extending from the surface to a depth at least 50 feet below the base of the lowermost USDW; and

(ii) Cemented back to the surface by recirculating the cement; and

(2) Long string casing and tubing;

(i) Extending to the injection zone; and

(ii) Cemented back to 50 feet above the base of the next largest casing string.

(b) The owner or operator of a new Class II well authorized by permit shall:

(1) Install surface casing from the surface to at least 50 feet below the base of the lowermost USDW.

(2) Cement the casing by recirculating to the surface or by using no less than 120% of the calculated annular volume.

(3) For new enhanced recovery wells, install tubing or long string casing extending to the injection zone.

(4) For new salt water disposal wells, install long string casing and tubing extending to the injection zone.

(5) Isolate any injection zone by placing sufficient cement to fill the calculated volume to a point 50 feet above the injection zone.

(c) The Regional Administrator may specify casing and cementing requirements other than those listed in paragraph (a) and (b) of this section on a case by case basis as conditions of the permit.

**Subpart OO—Rhode Island**

§§ 147.2000-147.2049 [Reserved]

**Subpart PP—South Carolina**

§§ 147.2050-147.2099 [Reserved]

**Subpart QQ—South Dakota**

§§ 147.2100-147.2149 [Reserved]

**Subpart RR—Tennessee**

§ 147.2150 State-administered program. [Reserved]

§ 147.2151 EPA-administered program.

(a) *Contents.* The UIC program for the State of Tennessee is administered by EPA. (This program consists of the UIC program requirements for 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.)

(b) *Effective date.* The effective date of the UIC program for Tennessee is: June 25, 1984.

§ 147.2152 Aquifer exemptions. [Reserved]

§ 147.2153 existing class I, II (except enhanced recovery and hydrocarbon storage) and III wells authorized by rule.

*Maximum injection pressure.* The owner or operator shall limit injection pressure to the lesser of:

(a) A value which will not exceed the operating requirements of § 144.28(f)(3) (i) or (ii) as applicable or

(b) A value for well head pressure calculated by using the following formula:

$$P_m = (0.600 - 0.433 S_g) d$$

where

$P_m$  = injection pressure at the well head in pounds per square inch

$S_g$  = specific gravity of inject fluid (unitless)

$d$  = injection depth in feet.

§ 147.2154 Existing class II enhanced recovery and hydrocarbon storage wells authorized by rule.

(a) *Maximum injection pressure.* (1) To meet the operating requirements of §§ 144.28(f)(3)(ii) (A) and (B) of this chapter, the owner or operator:

(i) Shall use an injection pressure no greater than the pressure established by the Regional Administrator for the field or formation in which the well is located. The Regional Administrator shall establish such a maximum pressure after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this chapter, and will inform owners and operators in writing of the applicable maximum pressure; or

(ii) May inject at pressures greater than those specified in paragraph (a)(1)(i) of this section for the field or formation in which he is operating, provided he submits a request in writing to the Regional Administrator and demonstrates to the satisfaction of the Regional Administrator that such injection pressure will not violate the requirement of §§ 144.28(f)(3)(ii) (A) and (B). The Regional Administrator may grant such a request after notice, opportunity for comment, and opportunity for a public hearing, according to the provisions of Part 124, Subpart A of this Chapter.

(2) Prior to such time as the Regional Administrator establishes rules for maximum injection pressure based on data provided pursuant to paragraph (a)(2)(ii) of this section the owner or operator shall:

(i) Limit injection pressure to a value which will not exceed the operating requirements of § 144.28(f)(3)(ii); and

(ii) Submit data acceptable to the Regional Administrator which defines the fracture pressure of the formation in which injection is taking place. A single test may be submitted on behalf of two or more operators conducting operations in the same formation, if the Regional Administrator approves such submission. The data shall be submitted to the Regional Administrator within one year of the effective date of this regulation.

(b) *Casing and Cementing.* Where the Regional Administrator determines that the owner or operator of an existing enhanced recovery or hydrocarbon storage well may not be in compliance with the requirements of §§ 144.28(e) and 146.22, the owner or operator shall comply with paragraphs (b) (1) through (4) of this section, when required by the Regional Administrator:

(1) Protect USDWs by:



(i) Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or

(ii) Isolating all USDWs by placing cement between the outermost casing and the well bore; and

(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and

(3) Use cement:

(i) Of sufficient quantity and quality to withstand the maximum operating pressure;

(ii) Which is resistant to deterioration from formation and injection fluids; and

(iii) In a quantity no less than 120% of the calculated volume necessary to cement off a zone.

(4) The Regional Administrator may specify other requirements in addition to or in lieu of the requirements set forth in paragraph (1)-(3) as needed to protect USDWs.

#### § 147.2155 Requirements for all wells—area of review.

Notwithstanding the alternatives presented in § 146.6 of this Chapter, the area of review shall be a minimum fixed radius as described in § 146.6(b) of this Chapter.

#### Subpart SS—Texas

##### § 147.2200 State-administered program—Class I, III, IV, and V wells.

*Requirements for Class I, III, IV, and V wells.* The UIC program for Class I, III, IV, and V wells in the State of Texas is the State-administered program approved by EPA pursuant to SDWA Section 1422. Notice of this approval was published on January 6, 1982 (47 FR 618); the effective date of this program is February 7, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Texas. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Injection Well Act, Texas Water Code §§ 27.002, 27.011 (Vernon Supp. 1984);

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a), are also part of the approved State-administered UIC program:

(1) Texas Water Code Annotated, Chapter 5 (Vernon 1972 and Supp. 1982);

(2) Injection Well Act, Texas Water Code Annotated, Chapter 27 (Vernon 1972 and Supp. 1982);

(3) Rules of Texas Department of Water Resources, Chapter 27; Rules of Texas Water Development Board, Chapter 22.

(c) The Memorandum of Agreement between EPA Region VI and the Texas Department of Water Resources, signed by the EPA Regional Administrator on October 11, 1981.

(d) *Statement of Legal Authority.*

"Underground Injection Control Program—Attorney General's Statement for Class I, III, IV, and V Injection Wells," signed by the Attorney General of Texas, June 11, 1981.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.

(f) Certain Class V wells are under the UIC program of the Texas Railroad Commission approved on April 23, 1982, under the authorities cited in § 147.2201 below.

##### § 147.2201 State-administered program—Class II wells

The UIC program for Class II wells in the State of Texas is the program administered by the Railroad Commission of Texas, approved by EPA pursuant to SDWA Section 1425. Notice of this approval was published in the *Federal Register* on April 23, 1982 (47 FR 17488). The effective date of this program was May 23, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Texas. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Injection Well Act, Texas Water Code Annotated §§ 27.031 and 27.033 (Vernon Supp. 1984);

(2) Texas Natural Resources Code Annotated §§ 85.041, 85.045, 85.046 and 85.052 (Vernon 1978 and Supp. 1982);

(3) Rules Having Statewide General Application to Oil, Gas, and Geothermal Resource Operations, §§ .051.02.02.000 to .051.02.02.080 (Railroad Commission of Texas, Oil and Gas Division, Revised 12-22-81), amended as follows:

(i) Amendment to 16 TAC § 3.9 (§ .051.02.02.009) issued December 21, 1981, effective April 1, 1982;

(ii) Amendment to 16 TAC § 3.46 (§ .051.02.02.046) issued December 21, 1981, effective April 1, 1982.

(iii) Amendment to 16 TAC § 3.71 (§ .051.02.02.074) issued December 21, 1981, effective April 1, 1982.

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference, are also part of the approved State-administered UIC program:

(1) Texas Water Code, Chapters 26, 27 and 29 (Vernon 1972 and Supp. 1982);

(2) Texas Natural Resources Code, Chapters 81, 85-89, 91 and 141 (Vernon 1978 and Supp. 1982);

(3) General Rules of Practice and Procedure, Subchapters A-J (Railroad Commission of Texas, adopted November 24, 1975, revised December 1980).

(c)(1) The Memorandum of Agreement between EPA Region VI and the Railroad Commission of Texas, signed by the EPA Regional Administrator on March 24, 1982.

(2) Letter from Director of Underground Injection Control, Railroad Commission of Texas, to Chief, Ground Water Protection Section, EPA Region VI, "Re: Letter of Clarification—UIC Program Application," March 21, 1982.

(d) *Statement of Legal Authority.* "Statement of Legal Authority of the Railroad Commission of Texas to conduct the Underground Injection Control Program," signed by Special Counsel, Railroad Commission of Texas, as submitted with "State of Texas Underground Injection Control Program Application for Primacy Enforcement Authority," prepared by the Railroad Commission of Texas, January 15, 1982.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart TT—UTAH

##### § 147.2250 State-administered program—Class I, III, IV, and V wells.

The UIC programs for Class I, III, IV, and V wells in the State of Utah is the program administered by the Utah Department of Health, Division of Environmental Health, approved by EPA pursuant to SDWA Section 1422. Notice of this approval was published in the *Federal Register* on January 9, 1983 (47 FR 2321). The effective date of this program is February 10, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by references.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by



reference and made a part of the applicable UIC program under the SDWA for the State of Utah. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Utah Pollution Control Act, Utah Code Annotated §§ 26-11-2, -8 and -10 (Supp. 1983);

(2) State of Utah Department of Health, Division of Environmental Health, Wastewater Disposal Regulations, Part VII: Underground Injection Control Program (adopted January 20, 1982) (Certified Official Copy signed by Chairman, Utah Water Pollution Control Committee).

(b) *Other laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a) of this section, are also part of the approved State-administered program:

(1) Utah Pollution Control Act, Utah Code Annotated §§ 26-11-1 to -20 (Supp. 1983).

(c)(1) The Memorandum of Agreement between EPA, Region VIII and the Utah Department of Health, Division of Environmental Health, signed by the Regional Administrator on August 16, 1982.

(2) Letter from Director, Utah Department of Health, Division of Environmental Health, Bureau of Water Pollution Control, to EPA Region VIII, "Re: Underground Injection Control Program—Utah," March 15, 1982.

(d) *Statement of Legal Authority.* (1) "Underground Injection Control Program—Attorney General's Statement," signed by Attorney General, State of Utah, January, 1982;

(2) Letter from Assistant Attorney General of Utah to Chief, Drinking Water Branch, EPA Region VIII, June 18, 1982.

(e) The Program Description and any other materials submitted as part of the application or supplements thereto.

#### § 147.2251 State-administered program—Class II wells.

The UIC program for Class II wells in the State of Utah is the program administered by the Utah Department of Natural Resources, Division of Oil, Gas and Mining, approved by EPA pursuant to SDWA Section 1425. Notice of this approval was published in the *Federal Register* on October 8, 1982 (47 FR 44561); the effective date of this program is November 7, 1982. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this

paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Utah. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) General Rules and Regulations and Rules of Practice and Procedure, by Order of: Board of Oil, Gas and Mining (of the State of Utah) (amended to March 23, 1978), as amended by Cause No. 190-4, Rule I—Underground Injection Criteria and Standards (adopted May 27, 1982).

(b) *Other laws.* [Reserved]

(c)(1) The Memorandum of Agreement between EPA, Region VIII and the Utah Department of Natural Resources, Division of Oil, Gas, and Mining and the Board of Oil, Gas and Mining, signed by the EPA Regional Administrator on July 19, 1983;

(2) Letter from Director, Division of Oil, Gas and Mining, Utah Department of Natural Resources and Energy, to Regional Administrator, EPA Region VIII, "Re: Aquifer Exemption Process," June 16, 1982;

(3) "Memorandum of Understanding" between Utah Department of Health and Utah Department of Natural Resources, dated March 5, 1981;

(4) "Second Addition to Agreement between the Department of Health and the Department of Natural Resources and Energy," dated December 15, 1981.

(d) *Statement of Legal Authority.* (1) Part III of "Primacy Application—Class II Underground Injection Wells," consisting of "Synopsis of Pertinent Statutes and Regulations," "Statement of Legal Authority," and "Certification by the Attorney General," by Assistant Attorney General, Department of Natural Resources and Energy, dated December 18, 1981;

(2) Letter from Assistant Attorney General, State of Utah, to EPA Region VIII, undated, received in the EPA Office of Regional Counsel June 10, 1982.

(e) The Program Description and any other materials submitted as part of the application or amendments thereto.

#### Subpart UU—Vermont

§§ 147.2300-147.2349 [Reserved]

#### Subpart VV—Virginia

§ 147.2350 State-administered program. [Reserved]

§ 147.2351 EPA-administered program.

(a) *Contents.* The UIC Program for the State of Virginia is administered by EPA. This program consists of the UIC program requirements for 40 CFR Parts 124, 144, and 146, and additional

requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements.

(b) *Effective date.* The effective date of the UIC program for Virginia is: June 25, 1984.

§ 147.2352 Aquifer exemptions. [Reserved]

#### Subpart WW—Washington

§§ 147.2400-147.2449 [Reserved]

#### Subpart XX—West Virginia

§§ 147.2450-147.2499 [Reserved]

#### Subpart YY—Wisconsin

§ 147.2500 State-administered program.

The UIC program for Class I, II, III, IV, and V wells in the State of Wisconsin is the program administered by the Wisconsin Department of Natural Resources, approved by EPA pursuant to SDWA Section 1422. Notice of this approval was published in the *Federal Register* on September 30, 1983 (48 FR 44783); the effective date of this program is November 30, 1983. This program consists of a prohibition of all injection wells except heat pump wells and may be found in the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirement set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Wisconsin. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Wisconsin Statutes Annotated §§ 147.015, 147.02 and 147.04 (West 1974 and Supp. 1983);

(2) Chapter NR 112, Well Construction and Pump Installation, Wisconsin Administrative Code §§ NR 112.03 and 112.20 (1981), as amended by Natural Resources Board Order No. WQ-25-82, approved by the Wisconsin Natural Resources Board on August 25, 1982;

(3) Chapter NR 113, Servicing Septic Tanks, Seepage Pit, Grease Traps or Privies, Wisconsin Administrative Code §§ NR 113.07-113.08 (1979), as amended by Natural Resources Board Order No. WQ-25-82, approved by the Wisconsin Natural Resources Board on August 25, 1982;

(4) Chapter NR 181, Hazardous Waste Management, Wisconsin Administrative Code §§ NR 181.04 and 181.415 (1981);

(5) Chapter NR 210, Sewage Treatment Works, Wisconsin



Administrative Code § 210.05, created by Natural Resources Board Order No. WQ-25-82, approved by the Wisconsin Natural Resources Board on August 25, 1982;

(6) Chapter 214, Land Application and Disposal of Liquid Industrial Wastes and By-Products, Wisconsin Administrative Code §§ 214.03 and 214.08 (1983).

(b) *Other Laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a), are also part of the approved State-administered program:

(1) Chapter 144, Water, Sewage, Refuse, Mining and Air Pollution, Wisconsin Statutes Annotated (West 1974 and Supp. 1983);

(2) Chapter 147, Pollution Discharge Elimination, Wisconsin Statutes Annotated (West 1974 and Supp. 1983);

(3) Chapter 162, Pure Drinking Water, Wisconsin Statutes Annotated (West 1974 and Supp. 1983);

(4) Laws of 1981, Chapter 20, § 2038 (re: heat pump injection);

(5) Wisconsin Statutes § 803.09(1) (West 1977) (intervention as of right in civil actions).

(c) The Memorandum of Agreement between EPA Region V and the Wisconsin Department of Natural Resources, signed by the Regional Administrator on December 6, 1983.

(d) *Statement of Legal Authority.* (1) "Attorney General's Statement," signed by Attorney General, State of Wisconsin;

(2) Letter from Assistant Attorney General, State of Wisconsin, to EPA Region V, "Re: Amendments to Attorney General's Statement—UIC," June 30, 1983.

(e) The Program Description and any other materials submitted as part of the application or as supplements thereto.

#### Subpart ZZ—Wyoming

##### § 147.2550 State-administered program—Class I, III, IV, and V Wells.

The UIC program for Class I, III, IV and V wells in the State of Wyoming is the program administered by the Wyoming Department of Environmental Quality, approved by EPA pursuant to Section 1422 of the SDWA. Notice of this approval was published in the *Federal Register* on July 15, 1983 (48 FR 32344); the effective date of this program is August 17, 1983. The program consists of the following elements as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the

SDWA for the State of Wyoming. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Wyoming Environmental Quality Act, Wyoming Statutes §§ 35-11-103, -301, -401, -405, -406, -408, -410, -415, -426 through -430 (1977 and Supp. 1983);

(2) Water Quality Rules and Regulations, Wyoming Department of Environmental Quality, Chapter III: Regulations for Permit to Construct, Install or Modify Public Facilities Capable or, (sic) Causing or Contributing to Pollution (certified copy, signed December 21, 1983);

(3) Water Quality Rules and Regulations, Wyoming Department of Environmental Quality, Chapter VIII: Quality Standards for Groundwaters of Wyoming (certified copy, signed April 9, 1980);

(4) Water Quality Rules and Regulations, Wyoming Department of Environmental Quality, Chapter IX: Wyoming Groundwater Pollution Control Permit (certified copy, signed April 9, 1980);

(5) Land Quality Rules and Regulations, Wyoming Department of Environmental Quality, Chapter XXI: In-Situ Mining.

(b) *Other Laws.* The following statutes and regulations, although not incorporated by reference except for select sections identified in paragraph (a), are also part of the approved State-administered program:

(1) Wyoming Environmental Quality Act, Wyoming Statute §§ 35-11-101 through 35-11-1207 (1977 and Supp. 1983);

(2) Article 9, Underground Water, Wyoming Statutes §§ 41-3-901 through 41-3-938 (1977);

(3) Wyoming Administrative Procedure Act, Wyoming Statutes §§ 9-4-101 through 9-4-115 (1977).

(c)(1) The Memorandum of Agreement between EPA, Region VIII and the Wyoming Department of Environmental Quality, signed by the EPA Regional Administrator on April 26, 1983.

(2) Letter from Regional Administrator, EPA Region VIII, to Governor of Wyoming, May 21, 1982, with Attachment (regarding aquifer exemptions);

(3) Letter from Governor of Wyoming to Regional Administrator, EPA Region VIII, "Re: Underground Injection Control (UIC) Program—Aquifer Exemption Issues," June 7, 1982;

(4) Letter from Regional Administrator, EPA Region VIII to Governor of Wyoming, "Re: Underground Injection Control (UIC) Program—Aquifer Exemption Issues," June 25, 1982;

(5) Letter from Director, Wyoming Department of Environmental Quality, to Acting Director, Water Management

Division, EPA Region VIII, December 1, 1982.

(d) *Statement of Legal Authority.* (1) "Attorney General's Statement—Wyoming Statutory and Regulatory Authority for Assumption of the Underground Injection Control Program Pursuant to the Federal Safe Drinking Water Act," signed by Attorney General and Assistant Attorney General for the State of Wyoming, September 22, 1982;

(2) Letter from Attorney General for the State of Wyoming to Acting Regional Counsel, EPA Region VIII, "Re: Wyoming Assumption of the UIC Program—\$36, Chapter IX, Wyoming Water Quality Rules and Regulations," November 24, 1982.

(e) The Program Description and any other materials submitted as part of the application or amendment thereto.

##### § 147.2551 State-administered program—Class II wells.

The UIC program for Class II wells in the State of Wyoming is the program administered by the Wyoming Oil and Gas Conservation Commission, approved by EPA pursuant to Section 1425 of the SDWA. Notice of this approval was published in the *Federal Register* on November 23, 1982 (47 FR 52434); the effective date of this program is December 23, 1982. This program consists of the following elements as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the State of Wyoming. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Rules and Regulations of the Wyoming Oil and Gas Conservation Commission, as amended by Cause No. 1, Order No. 29, Docket No. 222-81 (dated October 23, 1981), as amended by Correction Order, Cause No. 1, Order No. 29, Docket No. 222-81 (dated November 10, 1981).

(b) *Other Laws.* The following statutes and regulations, although not incorporated by reference, are also part of the approved State-administered program:

(1) Chapter 5, Oil and Gas, Wyoming Statutes Annotated §§ 30-5-101 through 30-5-126 (1977).

(c)(1) The Memorandum of Agreement between EPA, Region VIII and the Wyoming Oil and Gas Conservation Commission, signed by the EPA Regional Administrator on June 2, 1982.

(2) Amendment No. 1 to the



Memorandum of Agreement, dated December 22, 1982;

(3) Letter from State Oil and Gas Supervisor, Wyoming Oil and Gas Conservation Commission, to Acting Director, Water Management Division, EPA, Region VIII, "Re: Application for Primacy in the Regulation of Class II Injection Wells," March 8, 1982;

(4) Letter from State Oil and Gas Supervisor, Wyoming Oil and Gas Conservation Commission, to EPA Region VIII, "Re: Regulation of Liquid Hydrocarbon Storage Wells Under the UIC Program," July 1, 1982;

(5) Memorandum of Agreement Between the Wyoming State Board of Control, State Engineer, Oil and Gas Conservation Commission, and the Department of Environmental Quality, dated October 14, 1981.

(d) *Statement of Legal Authority.* (1) "Statement of Legal Authority" and "State Review of Regulations and Statutes Relevant to the UIC Program—Class II Wells," signed by Special Assistant Attorney General for the State of Wyoming, as submitted with "Wyoming Oil and Gas Conservation Commission, Application for Primacy in the Regulation of Class II Injection Wells under Section 1425 of the Safe Drinking Water Act," November 1981;

(2) Letter from Special Assistant Attorney General for the State of Wyoming to Assistant Regional Counsel, EPA Region VIII, May 13, 1982;

(3) Letter from Special Assistant Attorney General for the State of Wyoming to Assistant Regional Counsel, EPA Region VIII, July 1, 1982.

(e) The Program Description and other material submitted as part of the application or amendments thereto.

#### Subpart AAA—Guam

##### § 147.2600 State-administered program.

The UIC program for Class I, II, III, IV, and V wells in the territory of Guam is the program administered by the Guam Environmental Protection Agency, approved by EPA pursuant to SDWA Section 1422. Notice of this approval was published in the *Federal Register* on May 2, 1983 (47 FR 19717); the effective date of this program is June 1, 1983. This program consists of the following elements, as submitted to EPA in the State's program application:

(a) *Incorporation by reference.* The requirements set forth in the State statutes and regulations cited in this paragraph are hereby incorporated by reference and made a part of the applicable UIC program under the SDWA for the territory of Guam. This incorporation by reference was approved by the Director of the Federal Register on June 25, 1984.

(1) Water Resources Conservation Act, Government Code of Guam

§§ 57021–57025, Pub. L. 9–31 (March 9, 1967), as amended by Pub. L. 9–76 (July 29, 1967), as amended by Pub. L. 12–191 (December 30, 1974);

(2) Water Pollution Control Act, Government Code of Guam §§ 57042 and 57045, Pub. L. 9–76 (July 29, 1967), as amended by Pub. L. 9–212 (August 5, 1968), as amended by Pub. L. 10–31 (March 10, 1969), as amended by Pub. L. 12–191 (December 30, 1974);

(3) Guam Environmental Protection Agency, Underground Injection Control Regulations, Chapters 1–9, as revised by amendments adopted September 24, 1982;

(4) Guam Environmental Protection Agency, Water Quality Standards, Section I–IV (approved September 25, 1981, effective November 16, 1981).

(b) *Other Laws.* The following statutes and regulations, although not incorporated by reference except for specific sections identified in paragraph (a), are also part of the approved State-administered program:

(1) Government Code of Guam, Title XXV, Chapters I–III (§§ 24000–24207);

(2) Government Code of Guam, Title LXI, Chapters I–III (§§ 57000–57051);

(3) Government Code of Guam, Title LXI, Chapters VI (§§ 57120–57142);

(4) Government Code of Guam, Title LXI, Chapters VIII (§§ 57170–57188);

(5) Government Code of Guam, Title LXI, Chapters XII (§§ 57285–57299);

(c) The Memorandum of Agreement between EPA, Region IX and the Guam Environmental Protection Agency signed by the Regional Administrator on January 14, 1983.

(d) *Statement of Legal Authority.* (1) Letter from Attorney General of Guam to Regional Administrator, Region IX, "Re: Attorney General's Statement for Underground Injection Control Program (UIC), Ground Water Program Guidance #16" May 12, 1982;

(2) Letter from Attorney General of Guam to Regional Administrator, Region IX, "Re: Additional comments to be incorporated into the May 12, 1982, Attorney General's Statement for Underground Injection Control Program," September 2, 1982.

(e) The Program Description and any other materials submitted as part of the application or amendments thereto.

#### Subpart BBB—Puerto Rico

§§ 147.2650–147–2699 [Reserved]

#### Subpart CCC—Virgin Islands

§§ 147.2700–147.2749 [Reserved]

#### Subpart DDD—American Samoa

§ 147.2750 State-administered program. [Reserved]

#### § 147.2751 EPA-administered program.

(a) *Contents.* The UIC program for the State of American Samoa is administered by EPA. (This program consists of the UIC program requirements of 40 CFR Parts 124, 144, and 146, and additional requirements set forth in the remainder of the subpart. Injection well owners and operators, and EPA, shall comply with these requirements).

(b) *Effective date.* The effective date of the UIC program for American Samoa is: June 25, 1984.

§ 147.2752 Aquifer exemptions. [Reserved]

#### Subpart EEE—Commonwealth of the Northern Mariana Islands

§ 147.2800 State-administered program. [Reserved]

#### § 147.2801 EPA-administered program.

(a) *Contents.* The UIC program for the Commonwealth of the Northern Mariana Islands is administered by EPA. (This program consists of the UIC program requirements of 40 CFR Parts 124, 144, 146, and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements).

(b) *Effective date.* The effective date of the UIC program for the Northern Mariana Islands is: June 25, 1984.

§ 147.2802 Aquifer exemptions. [Reserved]

#### Subpart FFF—Trust Territory of the Pacific Islands

§ 147.2850 State-administered program. [Reserved]

#### § 147.2851 EPA-administered program.

(a) *Contents.* The UIC program for the Trust Territory of the Pacific Islands is administered by EPA. (This program consists of the UIC program requirements for 40 CFR Parts 124, 144, and 146 and additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA, shall comply with these requirements).

(b) *Effective date.* The effective date of the UIC program for the Trust Territory of the Pacific Islands is: June 25, 1984.

§ 147.2852 Aquifer exemptions. [Reserved]

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