



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 13 1991

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Modification of Class I Hazardous Waste Injection Well
"No Migration" Exemptions -- Underground Injection
Control Program Guidance # 74

FROM: Michael B. Cook, Director *Peter S. Cook for*
Office of Drinking Water (WH-550)

TO: Water Division Directors
EPA Regions I - X

PURPOSE

This document provides guidance for modifying "no migration" exemptions from the land disposal restrictions imposed by the Agency in response to the Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA). Class I injection well operators, who have received approval of their petition to the Agency for such an exemption (see 40 CFR 148.20), may seek the Agency's approval to update, alter, modify, or amend the terms of that exemption.

This guidance describes procedures for notifying EPA of technical changes which an operator seeks to make or, where necessary, for seeking a formal modification or reissuance of an exemption. This document provides the following guidance:

- The circumstances when an operator should notify EPA of changes which relate to an exemption
- When it is appropriate to seek formal petition modification or reissuance of the exemption
- When a modification is appropriate, or whether an exemption must be reissued after a review of additional data relating to the proposed change, and
- Under which circumstances and to what extent will public participation be required for comment on any changes.

This document is not intended to be an exhaustive review of all aspects of exemption modifications, but it is intended to provide a basis for updating, modifying, or reissuing exemptions

in a manner which recognizes the objective of the Underground Injection Control Program to protect underground sources of drinking water (USDW) and human health and the environment. Also, the technical guidance contained in this document for exemption modifications and reissuance of no migration petitions may be more appropriate for fluid flow and transport demonstrations under 40 CFR 148.20 (a)(1)(i). We will provide additional guidance to the Regions for chemical transformation petitions under 40 CFR 148.20 (a)(1)(ii) if it comes necessary.

BACKGROUND

Exemptions to the land disposal restrictions for the deep well injection of hazardous waste are granted upon a successful demonstration that -- to a reasonable degree of certainty -- there will be no migration of hazardous constituents from the injection zone for as long as the wastes remains hazardous. See RCRA Section 3004 and 40 CFR §148.20. After a no migration petition is approved by the Agency, an operator may need or wish to make changes relating to the petition which were not anticipated at the time the initial petition was filed, but which should be reflected in the petition or the scope of the petition approval. These changes may be administrative in nature (corporate name change, equipment change in the facility) which do not affect the wastes addressed in the petition, or they may be changes directly relating to the injection operation. This latter category of changes can range from the identification or new listing of a waste that was the subject of, or described in, an initial exemption demonstration, to substantive changes such as the injection of new wastes which differ hydraulically and chemically from the wastes which were the subject of the initial petition.

The Agency has promulgated regulations that outline, in broad terms, the procedures for altering exemptions where the changes an operator seeks to make are more than clerical in nature, and may affect the demonstration. See 40 CFR 148.20 (e) and (f). These regulations provide a framework for assessing changes that a well operator may wish to make, and for determining whether the changes are supported by data submitted with the petition for exemption or whether the review of additional data is appropriate.

A modification of an exemption under §148.20 is intended to be an efficient mechanism for apprising the Agency of a proposed change, and providing assurance that data supports the modification. In general, a modification request involving the addition of a waste requires a showing that the additional waste will behave hydraulically and chemically in a manner similar to wastes for which a demonstration has already been made, and that the inclusion of the additional waste will not interfere with the containment capability of the injection zone. For flow and

transport petitions, similarity is shown by demonstrating that the new waste will not alter the hydraulic and chemical behavior of the waste stream, and that the location of the waste plume will not change significantly from the initial demonstration. If the Agency accepts this demonstration, the scope of an exemption should be modified accordingly.

A petition for reissuance is more involved, and also requires proof of compliance with the no migration standard by meeting the requirements set forth at § 148.20, as well as compliance with public notice and comment procedures of 40 CFR 124.10.

I. Nonsubstantive Revisions

Nonsubstantive revisions are changes which do not affect the actual no migration demonstration, but relate to matters addressed in the petition. These types of revisions include changes at an injection facility that are unrelated to the petition or that do not alter technical matters in a petition (an example of a technical matter includes waste stream parameters modeled in the petition). Equipment or process changes at a facility are generally nonsubstantive, although the reporting of such changes may be required for other purposes under the terms of EPA or State-issued permits or regulations.

Examples of nonsubstantive changes include, but are not limited to the following:

- Typographical errors in the petition approval notice or underlying documentation.
- Facility change of corporate name, where there is no change in ownership.
- Removal or expiration of conditions imposed prior to well completion and that are no longer operative after final field work for the new or recompleted well (e.g. exact injection interval depths are not identical).
- Well perforation location change in an injection interval already modeled in the approved petition.

Facility operators should give the Agency notice of such nonsubstantive changes promptly in writing, or when the need for a typographical change is recognized. Although nonsubstantive revisions do not require the Director's approval, a reply indicating agreement or disagreement that the change is nonsubstantive will be sent by the Agency. All correspondence regarding nonsubstantive changes will be placed in the Administrative Record for the petition. Public notice or a comment period are not necessary for nonsubstantive changes

because all essential aspects of the demonstration have already been made available during the approval process.

The Agency does not need to be notified of changes that are unrelated to injection operations and the petition exemption process. For example, notice is not necessary for facility personnel changes, and changes in plant operations or process equipment changes unrelated to injection operations.

II. Exemption Modification

Under §148.20(f), an exemption may be modified if the Director determines that any additional waste will behave hydraulically and chemically as previously included wastes, and will not interfere with the containment capability of the injection zone. For flow and transport modeling, the fundamental determinants of whether a change could be addressed by a modification are the upward and outward movement of the injected waste plume, and any pressure buildup in the injection zone. Where movement of the waste plume will not extend significantly beyond what was modeled in the initial demonstration, using the same degree of conservatism, a modification (rather than a reissuance) would be appropriate. A reissuance would be required if the location of the injected waste plume was shown to move significantly beyond upward and outward limits defined by the petition demonstration, or if an increased pressure buildup in the injection zone were to affect the initial petition demonstration. Similarity should be judged by examining the effect of the change on the entire injected waste stream and the overall injection operation.

Examples of changes which may be addressed by an exemption modification include:

- The addition of waste constituents already addressed in the no migration demonstration, which have become newly listed or identified as hazardous in 40 CFR Part 261.
- The operator seeks to alter operational flow rate or volume of wastes for a particular well, only if these changes were covered in the initial demonstration and that the results of the new changes, such as waste plume location and pressure, fall within the results of the initial demonstration.
- The operator seeks to inject a waste that was the subject of the demonstration, but includes a new hazardous constituent which will not significantly affect plume behavior (unless the new constituent has a health-based level which results in the need to model distances greater than those modeled in the initial petition).

In these examples, it must be demonstrated that the location of the waste plume will not move significantly beyond what was modeled in the initial demonstration. In all such cases, the operator must receive the Director's approval prior to the initiation of any changes.

Changes consistent with operational parameters, or within defined ranges, described in the petition can be made at any time without notice.

A. Newly Listed or Identified Hazardous Waste

Where a waste component covered by the initial demonstration becomes newly listed or identified by the Agency as hazardous pursuant to 40 CFR Part 261 (such as wastes in the Toxicity Characteristics Rule. See 55 FR 11798.), it is not necessary to make a more detailed showing. However, the operator should inform the Agency in writing, that a waste which is already being injected under an existing exemption has been newly listed or identified. Notice should be given by the operator prior to the effective date of any rules prohibiting the land disposal of such waste, and should identify the rule and waste affected. This notice should also state that the waste was already the subject of a no migration demonstration and reference applicable portions of the petition. A request for exemption modification pursuant to 40 CFR 148.20 (f) on the basis of the demonstration that accompanied the initial petition should be made. The Director will send his decision regarding the modification to the facility operator prior to the date(s) restricting injection of such waste.

B. Modification for New Waste or New Constituent

Where an operator seeks to inject a new waste not the subject of the initial demonstration, but the new waste is similar to wastes included in the initial petition, the operator should submit data to demonstrate that the additional waste will behave hydraulically and chemically in a similar manner to injected wastes. A demonstration must be made that the new or altered waste will not interfere with the containment capability of the injection zone and the location of the waste plume will not significantly differ from the initial demonstration. The demonstration should be judged by determining whether the new or altered waste, when added to the injected waste stream, will cause the injected wastes to behave differently from the waste stream modeled in the initial demonstration.

The submission should include a demonstration that the new waste is compatible, of similar density, and mobility. The demonstration should be submitted in writing, and should include supporting documentation sufficient to establish the hydraulic

and chemical similarity of the injectate after the addition of the new waste. The documentation may include references to texts, treatises, or affidavits that describe the properties of the new waste. Appropriate references to the initial demonstration describing relevant hydraulic and chemical parameters, both for the injectate and formation fluids, should be made by the operator. The operator should reference UIC Guidance No. 71 for applicable health-based limits.

C. Change in Rate or Volume of Injected Waste

In some cases, an operator may wish to inject the same waste stream at a greater rate or volume than was contemplated by the original exemption issued. In these cases, the waste characteristics have not changed, therefore the waste will, by definition, behave in a chemically similar manner. The operator should submit data, however, sufficient to demonstrate that the hydraulic behavior of the changed rate or volume will not be significantly different from what was described in the initial petition demonstration.

D. Change in Density of Fluids

Where an operator seeks to modify the density of injected fluids, a demonstration of hydraulic similarity will depend largely upon the characteristics of formation fluids. If a new or altered waste causes the injected waste stream to vary in density from the waste stream modeled in the initial petition, and this change in density does not significantly expand the waste plume beyond what was previously modeled, then a request for modification is appropriate. Changes in waste density which will significantly expand the waste plume beyond the initial demonstration should be addressed in a petition reissuance.

E. Similarity Standard for Modifications

The determination of similarity will depend largely upon the modeling parameters of the initial petition demonstration and site-specific conditions. For example, if the modeling conducted for the initial petition was based upon a range of fluid densities and the injectate including the new or altered waste is within the limits of the range, then the waste is sufficiently similar to injected wastes with regard to density.

The operator should explain how the original modeling is sufficient to describe the behavior of injected wastes when a modification is made, or submit such additional modeling as is necessary to describe the behavior of the injected wastes. If a new waste has a health-based maximum concentration level (MCL) which results in the need to model lateral or upward movement

greater than previously modeled, then a reissuance of the exemption is necessary. Otherwise, if there is no need for expanding the size or location of the waste plume, then the similarity standard is met and a modification is appropriate.

F. Agency Approval and Public Notice

If the Director has been satisfied that the similarity standard has been met for a modification, then a modification for the exemption should be issued. If review of further data is necessary, or if the Agency believes that the contemplated change is not sufficiently similar, the Director will inform the operator. If the Agency determines that the addition of a new waste will change the character of the waste stream, or any other change will not meet the similarity standard, the operator then has the option of submitting a petition for reissuance of the exemption pursuant to 40 CFR 148.20 (e).

Public notice following the procedures in 40 CFR Part 124 should be given of the Director's determination regarding modification, unless the Director has denied the modification request and informed an operator that a petition for reissuance should be sought. Public notice should specify the original petition and the modification sought, and should be limited to the modification and supporting documentation, and should not extend to issues raised by the original petition, or any prior modification, because the essential site data and modeling parameters have already been noticed for public comment.

III. Exemption Reissuance

Where an operator seeks to inject an additional waste that will cause the injected fluid to behave in a manner that is not sufficiently similar, where an operator seeks to expand the injection zone either upward or outward or by increasing pressure build-up, where an attempt to demonstrate similarity under §148.20 (f) is unsuccessful, or where new information is available which invalidates the original petition demonstration, it is necessary to submit a petition for reissuance of an exemption under §148.20 (e). Modifications of any conditions for no migration exemptions must also follow reissuance procedures under §148.20 (e), unless the conditions are self-expiring or can qualify as a non-substantive revision.

Petition reissuance for flow and transport demonstrations is directed primarily at those situations where the injected waste plume will move significantly beyond the outward and upward limits defined by the initial petition demonstration. A petition for reissuance must meet the no migration standard set forth in § 148.20.

Where an operator seeks to recomplete a well within an injection interval not specified in the demonstration, and if the injection interval location is specified as a petition condition, then the location of the new well completion and the injection interval modeled in the petition should both be identified.¹ The new completion should be in a comparable injection interval (i.e. similar porosity and permeability) to the modeled interval in order for the original demonstration to be still applicable. The operator should submit data to demonstrate that the change in the perforation location will not expand the location of the waste plume as modeled in the petition. If additional modeling is necessary, it must be submitted with the request for reissuance.

Much of the data submitted in connection with the initial petition may be relied upon to support a reissuance. For example, data regarding underground water sources, and geochemical and geologic conditions at the site should be unchanged. Data regarding hydraulic gradient and hydrostatic pressure in the injection zone will be unchanged unless the limits of the injection zone change significantly. This type of material can be incorporated by reference into a petition for reissuance. It is necessary, however, to submit waste-specific information, as well as new computer modeling data that is appropriate to the characteristics of the injectate bearing the new waste.

The requirements of §148.22, including public notice and comment provisions set forth at §124.10, should be applicable to petitions for reissuance. All aspects of the demonstration should be made available for public comment during the approval process for petition reissuance.

CONTACT

This guidance should be used by the Regions when modifying or reissuing Class I hazardous waste injection well no migration exemptions. Injection well facility operators should contact the appropriate EPA regional office when seeking exemption modification or reissuance. For any questions regarding this guidance contact Bruce J. Kobelski, EPA Headquarters, at FTS 382-7275.

¹ If the exact location of perforations has not been specified as a condition of the petition, and the entire injection interval has been modeled in the demonstration, a nonsubstantive revision is appropriate when the operator needs to recomplete the well.