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OPINION LETTER NO. 63

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Mr. Fred A. Lafser
Director, Missouri Department
of Natural Resources
1915 Southridge Plaza
Jefferson City, MO 65101

Dear Mr. Lafser:

This letter, and the attached Memorandum Opinion which was prepared by my assistant, Kirk Lohman, and which I approve, constitute the Attorney General's Statement required by 40 CFR 123.5 as part of the Application for Authorization submitted to the U.S. Environmental Protection Agency by the Missouri Department of Natural Resources, pursuant to 40 CFR 123, Subpart C.

I hereby certify, pursuant to my authority as Attorney General of the State of Missouri, that in my opinion the laws of the State of Missouri, as discussed in the following Memorandum, provide adequate authority to carry out the program for the regulation of underground injection set forth in the "Program Description" submitted to the U.S. Environmental Protection Agency by the Missouri Department of Natural Resources. The specific authorities discussed are contained in statutes and regulations lawfully adopted and in force at the time of this statement.

Sincerely,

John Ashcroft

JOHN ASHCROFT
Attorney General

MEMORANDUM OPINION

This memorandum opinion will be divided into two parts. The first part will relate to Missouri's Underground Injection Control Program governing Class II wells. The Class II part of the program is being submitted pursuant to § 1425 of the Safe Drinking Water Act, 42 U.S.C.A. § 300(f) et seq., and is subject to the requirements of § 1421(b)(1)(A) through (D) of the Act. The second part of the opinion will address the state's legal authority to carry out its UIC program in regard to Class I, III, IV, and V wells. This part of the program is being submitted under § 1422 of the Safe Drinking Water Act and is subject to the regulations contained in 40 CFR Parts 122, 123, 124, and 146.

Injection wells are classified in 40 CFR 146.05 as follows:

Class I

(1) Wells used by generators of hazardous wastes or owners or operators of hazardous waste management facilites to inject hazardous waste, other than Class IV wells.

(2) Other industrial and municipal disposal wells which inject fluids beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

Class II

Wells which inject fluids:

(1) Which are brought to the surface in connection with conventional oil or natural gas production;

(2) For enhanced recovery of oil or natural gas; and

(3) For storage of hydrocarbons which are liquid at standard temperature and pressure.

Class III

Wells which inject for the extraction of minerals or energy, including:

(1) Mining of sulfur by the Frasch process;

(2) In situ production of uranium and other metals. This category includes only in situ production from ore bodies which have not been conventionally mined. Solution mining of conventional mines such as stopes leaching is included in Class V;

(3) Solution mining of salts or potash;

(4) In situ combustion of fossil fuel; and

(5) Recovery of geothermal energy to produce electric power.

Class IV

Wells used by generators of hazardous wastes or of radioactive wastes, by owners or operators of hazardous waste management facilities, or by owners or operators of radioactive waste disposal sites to dispose of hazardous wastes or radioactive wastes into or above a formation which within one quarter mile of the well contains an underground source of drinking water.

Class V

Injection wells not included in Class I, II, III, or IV.

All statutory references in this memorandum are to the Revised Statutes of Missouri (RSMo 1978), unless otherwise indicated. All regulatory references are to the Code of State Regulations (CSR).

I. Class II Wells

A. Statutory and Regulatory Framework

Chapter 259, the Missouri Oil and Gas Production Law, was adopted in 1965 to regulate oil and gas production in Missouri and provides the basic authority for regulation of injection well activities. The statute created the "State Oil and Gas Council" to administer the provisions of the law. Section 259.070 describes the powers and duties of the Council. This section provides that the Council, acting through the office of the state geologist, has the authority:

> (1) To require:
>
> (a) Identification of ownership of oil or gas wells, producing leases, tanks, plants, structures, and facilities for the refining or intrastate transportation of oil and gas;
>
> (b) The making and filing of all mechanical well logs and the filing of directional surveys if taken, and the filing of reports on well location, drilling and production, and the filing free of charge of samples and core chips and of complete cores less tested sections, when requested in the office of the state geologist within six months after the completion or abandonment of the well;
>
> (c) The drilling, casing, operation, and plugging of wells in such manner as to prevent the escape of oil or gas out of one stratum into another; the intrusion of water into oil or gas stratum; the pollution of fresh water supplies by oil, gas, or highly

mineralized water; to prevent blowouts, cavings, seepages, and fires; and to prevent the escape of oil, gas, or water into workable coal or other mineral deposits;

(d) The furnishing of a reasonable bond with good and sufficient surety, conditioned upon the full compliance with the provisions of this chapter, and the rules and regulations of the council prescribed to govern the production of oil and gas on state and private lands within the state of Missouri;

***

(i) That every person who produces, sells, purchases, acquires, stores, transports, refines, or processes native and indigenous Missouri produced crude oil or gas in this state complete and accurate records of the quantities thereof, which records shall be available for examination by the council or its agents at all reasonable times, and that every such person file with the council such reports as it may prescribe with respect to such oil or gas or the products thereof;

(2) To regulate pursuant to rules adopted by the council:

(a) The drilling, producing, and plugging of wells, and all other operations for the production of oil or gas;

(b) The shooting and chemical treatment of wells;

(c) The spacing of wells;

(d) Operations to increase ultimate recovery such as cycling of gas, the maintenance of pressure, and the introduction of gas, water, or other substances into producing formations; and

(e) Disposal of highly mineralized water and oil field wastes;

(3) To limit and to allocate the production of oil and gas from any field, pool, or area;

(4) To classify wells as oil or gas wells for purposes material to the interpretation or enforcement of this chapter;

(5) To promulgate and to enforce rules, regulations, and orders to effectuate the purposes and the intent of this chapter.

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Pursuant to its rule-making authority, the Council has adopted rules regulating the permitting, drilling, plugging, and spacing of oil and gas wells. More recently, the Council has established rules relating to the drilling and operation of injection wells. These rules were adopted by the Council on January 4, 1982, and became effective ten days after publication in the Missouri Register on February 1, 1982. All rules of the Oil and Gas Council are contained in 10 CSR 50, chapters 1-5.

B. Review Criteria

Under § 1425 of the Safe Drinking Water Act, a state may submit that part of its UIC program relating to Class II wells if it can demonstrate that a Class II well program meets the requirements of § 1421(b)(1)(A) through (D). The requirements under § 1421(b)(1) are that:

(A) The state program prohibit any underground injection not authorized by permit;

(B) The state program requires a permit applicant to show that underground injection will not endanger drinking water sources;

(C) The state program includes inspection, monitoring, recordkeeping, and reporting requirements; and

(D) The state program applies to federal agencies and to persons on property owned or leased by the United States.

In addition to these four requirements, the state must also show that its program represents an effective program to prevent underground injection which endangers drinking water sources. These five criteria will each be discussed separately.

1. Prohibition of Unauthorized Injection (SDWA § 1421(b)(1)(A))

The state prohibits any unauthorized Class II underground injection by requiring that a permit be obtained for all wells drilled for oil or gas production, or wells used for fluid injection or waste disposal.

Citation of Laws and Regulations

Section 259.070

Section 259.080

Section 250.200

Section 259.210

10 CSR 50-2.010

10 CSR 50-2.020

10 CSR 50-2.030

10 CSR 50-2.090

Explanation of Authority

Section 259.080 provides that it shall be unlawful to drill or deepen any well for oil or gas without first obtaining a permit from the state geologist under such regulations as may be prescribed by the Missouri Oil and Gas Council. Under § 259.070, the Oil and Gas Council has the authority to require the drilling, casing, operation, and plugging of wells in such

manner as to prevent the pollution of fresh water supplies by oil, gas, or highly mineralized water. It also has the authority to regulate pursuant to rules adopted by the council the drilling, producing, plugging and all other operations for the production of oil and gas; operations to increase recovery by the introduction of gas, water, or other substances into producing formations; and the disposal of highly mineralized water and oil field waste.

Pursuant to the authority granted it by §§ 259.070 and 259.080, the Oil and Gas Council has adopted regulations which require that all wells related to oil or gas production, be they primary recovery, injection, or waste disposal wells, be permitted. Oil and Gas Council regulation 10 CSR 50-2.030 requires that prior to the commencement of operations, an application for permit must be made with the state geologist. To obtain a permit for a Class II injection well, the applicant must submit Form OGC-3I. An organization report and a bond must also be filed prior to the commencement of operations (10 CSR 50-2.010, 10 CSR 50-2.020). In addition, 10 CSR 50-2.090 provides that prior to the disposal of fluid by injection, a permit application must be submitted and approved by the state geologist. Together with Form OGC-3I (application for permit), the applicant must also submit a location plat (Form OGC-4I), a schematic drawing of the well (Form OGC-11), and any other pertinent data concerning the details of the proposed operation which may be required by the state geologist.

The state program also provides an appropriate formal mechanism for modifying permits in cases where the operation has undergone a significant change. Regulation 10 CSR 50-2.030(14) provides that prior to any substantial change in the method of operation of any well, the operator of such well shall submit a revised application form to the state geologist. The state geologist shall have at least 15 days to review the revised application, and to either approve or deny the proposed modification. No substantial change in the operation of a well may be commenced until it has been approved in writing by the state geologist.

Under these regulations, it is clear that a permit must be obtained for all Class II injection wells and that no substantial change may take place in the operations of a permitted Class II well unless such change has been approved in writing by the state geologist. Section 259.080 provides that it shall be unlawful to commence operations for the drilling of any well for oil or gas without first obtaining a permit from the state geologist under the rules and regulations prescribed by the Oil and Gas Council. Violations of § 259.080, and the rules and regulations of the Oil and Gas Council, are subject to the penalties provided in § 259.200. Section 259.200 provides that such violations are subject to a penalty of up to $1,000 for each violation and for each day that such violation continues. The Attorney General is authorized to file suit in the name and on behalf of the Oil and Gas Council to recover such penalties. Section 259.210 authorizes

suit for injunctive relief to restrain any person who is violating or threatening to violate any provison of Chapter 259, or any rule, regulation or order of the Oil and Gas Council. Injection wells drilled or operated without a permit would be subject to a penalty of up to $1,000 per day under § 259.200. The operation of an unpermitted injection well would be enjoinable pursuant to § 259.210.

2. Permit applicant to show that underground injection will not endanger drinking water sources. (SDWA § 1421(b)(1)(B))

The state requires a permit applicant to show that the proposed injection will not endanger drinking water sources by requiring the applicant to provide detailed information concerning the nature of the injection project, the injection interval, and any underground sources of drinking water which may be affected. Based upon this information, the state geologist may grant the permit or deny it if he feels that an underground source of drinking water will be endangered.

Citation of Laws and Regulations

10 CSR 50-2.030

10 CSR 50-2.040

10 CSR 50-2.090

Explanation of Authority

A permit applicant is required to submit to the state geologist sufficient information to allow the state geologist to make a knowledgeable decision to grant or deny the permit. Regulation 10 CSR 50-2.030 provides that a permit applicant

for an injection well shall file Form OGC-3I with the state geologist. On Form OGC-3I, the applicant must provide detailed information concerning the nature and operation of the proposed injection project. Data to be provided on Form OGC-3I includes:

a. Well location and lease description, including the size of the lease and the distances from the proposed well to other wells on the lease and to the lease lines;

b. An outline of the proposed stimulation program;

c. Proposed casing to be used, including amount, size, weight per foot, and cement;

d. Average and maximum daily injection, including rate, pressure, and volume of injection;

e. Estimated fracture pressure/gradient of injection zone;

f. Source and analysis of injection fluid;

g. Description of the compatibility of the injection fluid with the receiving formation;

h. Descriptions of the injection and confining zones, including lithographic description, geologic name, thickness, depth, porosity, and permeability;

i. All available logging and testing data on the well;

j. Detailed description of any well needing corrective action which penetrates the injection zone in the area of review, including the reason for and proposed corrective action.

Regulation 10 CSR 50-2.030(3) provides that an accurate location plat (Form OGC-4I) shall accompany the application.

Such a plat shall show the area of review for the applicant well and all area of review wells of public record that penetrate the injection interval. Descriptions of all area of review wells shall be provided and shall include the lease name, well number, location, owner, depth, type, date spudded, date completed, and the construction.

Regulation 10 CSR 50-2.030(4) requires that a schematic diagram (Form OGC-11) of the injection well be submitted prior to approval of the application. The schematic diagram shall include:

a. Configuration of the well head;

b. Total depth and/or plug-back total depth;

c. Depth of all injection or disposal intervals and their formation names;

d. Lithography of all formations penetrated;

e. Depths of the tops and bottoms of all casing and tubing;

f. Type and depth of packer;

g. Depth, location, and type of all cement;

h. Depth of all perforations and squeeze jobs;

i. Geologic name and depth to bottom of all underground sources of drinking water which may be affected by the injection.

Based upon the information provided in Forms OGC-3I, OGC-4I, and OGC-11, the state geologist makes a determination to issue or deny the permit for an injection well. In addition to the permit requirements, all new or newly converted injection wells

are required to demonstrate mechanical integrity for the absence of significant leaks and the absence of significant fluid movement in vertical channels prior to the commencement of operations under Regulation 10 CSR 50-2.040. All logs and test data are to be sent to the state geologist prior to the commencement of operations. Under 10 CSR 50-2.040(7), the state geologist will establish maximum injection pressure for the well to insure that fractures are not created or enlarged and that injected fluid will not migrate into an underground source of drinking water. Regulation 10 CSR 50-2.090 also provides that before any produced fluids may be disposed of by injection, Forms OGC-3I, OGC-4I, and OGC-11, and any other information required must be submitted to and approved by the state geologist prior to any injection.

By requiring the permit applicant to provide detailed information concerning the geology of the proposed injection and the nature of the proposed injection project, the state program places the burden on the permit applicant to show that the proposed injection will not endanger underground drinking water sources.

3. Inspection, Monitoring, Recordkeeping, and Reporting (SDWA § 142(b)(1)(c))

State statutes and regulations provide for inspection, monitoring, recordkeeping, and reporting of injection well operations.

Citation of Laws and Regulations

Section 259.070

10 CSR 50-2.040

10 CSR 50-2.050

10 CSR 50-2.080

10 CSR 50-2.100

Explanation of Authority

Section 259.070 delegates to the Oil and Gas Council "the duty and the authority to make such investigations as it deems proper to determine whether waste exists or is imminent or whether other facts exist which justify action." Section 259.070 (1)(b) further authorizes the Council to require the making and filing of mechanical well logs, directional surveys, reports on well location, drilling, and production, and the filing of samples and core chips if requested by the state geologist. Section 259.070(2) authorizes the Council to regulate by rule:

> (a) the drilling, producing, and plugging of wells, and all other operations for the production of oil or gas;
>
> (b) the shooting and chemical treatment of wells;
>
> (c) the spacing of wells;
>
> (d) operations to increase ultimate recovery such as cycling of gas, the maintenance of pressure, and the introduction of gas, water, or other substances into producing formations; and
>
> (e) disposal of highly mineralized water and oil field wastes.

Finally, under § 259.070(5), the Council is authorized to promulgate and enforce rules, regulations, and orders to effectuate the purposes and the intent of Chapter 259. We construe these provisions to empower the Council to inspect and monitor injection wells, to require that accurate records concerning

injection well activities be maintained and filed with the Council, and to adopt rules and regulations to accomplish these ends.

The regulations contained in 10 CSR 50-2.040, 2.050, 2.080, and 2.100 flesh out the inspection and reporting requirements of the state program. Regulation 10 CSR 50-2.040(11) provides that the state geologist or an authorized representative shall have the authority to sample injected fluids at any time during an injection operation. Regulation 10 CSR 50-2.080(2) states that an operator shall file monthly reports of injected fluids, describing the method of disposal of all water produced from oil or gas wells and enhanced recovery operations. Regulation 10 CSR 50-2.100(3) also requires that monthly reports be submitted for fluid injection projects. The operator is required to monitor the injection pressure and rate on each injection well on at least a monthly basis with the results reported annually to the state geologist under 10 CSR 50-2.080(6). All monitoring reports will be retained for at least five years by the state geologist (10 CSR 50-2.080(7)). The requirement that an operator provide prompt notice of mechanical failure is addressed in both 10 CSR 50-2.080(5) and 10 CSR 50-2.040(10). Regulation 10 CSR 50-2.080(5) provides that an operator shall notify the state geologist of any mechanical failure of an injection well or of any other condition which threatens to contaminate an aquifer. Regulation 10 CSR 50-2.040(10) requires an operator to inform the state geologist of any well which cannot demonstrate mechanical integrity and to

cease operation of the well. If corrective action cannot restore mechanical integrity within 30 days, the operator must again inform the state geologist, who may grant an additional 30 days to restore mechanical integrity before ordering the well plugged.

We conclude that the state has an adequate program to carry out an effective system of inspection, monitoring, reporting, and recordkeeping.

4. Authority to Regulate Federal Agencies and Persons on Property Owned or Leased by the United States (SDWA § 1421(b)(1)(D))

State statutes provide authority to regulate injection well activites by federal agencies and by persons on property owned or leased by the United States.

Citation of Laws and Regulations

Section 1.020

Section 259.050

Section 259.070

Section 259.090

Section 259.200

Section 259.210

Explanation of Authority

Chapter 259 does not specifically address the question of its applicabilty to federal agencies and facilities, but it is the opinion of this office that the provisions of Chapter 259 govern Class II injection well activities by federal agencies and on federal lands.

Section 259.080, which states that it shall be unlawful to commence oil or gas drilling operations without a permit, does

not specify who it is that must obtain a permit. However, §§ 259.200 and 259.210, the sections relating to injunctive relief and penalties, both provide that action may be taken against any person who violates the provisions of Chapter 259, or the rules, regulations, or orders of the Oil and Gas Council. "Person" is not defined in Chapter 259. Section 1.020 does provide a definition. It states:

> 1. As used in the statutory laws of the state, unless otherwise specially provided or unless plainly repugnant to the intent of the legislature or to the context thereof:
>
> ***
>
> (7) The word "person" may extend and be applied to bodies politic and corporate, and to partnerships and other unincorporated associations.

The term "body politic" has not been further defined by Missouri law or statute. However, this term has generally been construed to include the United States and agencies of the federal government (See Body, 11 C.J.S. 380; United States v. Maurice, 26 Fed. Cas. 1211, 1216, No. 15, 747 (C.J. Marshall): "The United States is a government, and, consequently, a body politic and corporate."). Thus, we construe "bodies politic" to include federal agencies, and conclude that "person" as defined in § 1.020 and as used in Chapter 259 includes agencies of the federal government.

Other language in Chapter 259 indicates that its provisions apply to all oil or gas operations within the state, regardless of ownership or location. Section 259.070(3) provides that the

Oil and Gas Council has the authority "to limit and allocate the production of oil and gas from any field, pool, or area." In the definition contained in § 259.050, "illegal gas" it is defined as gas which has been produced from any well within the state in excess of the quantity permitted. . . ." "Illegal oil" is defined in the same fashion as excess oil produced from any well within the state. Section 259.090, concerning the regulation of production, contains similar language. Paragraph 3 provides:

> Whenever the council limits the total amount of oil or gas which may be produced in any pool in this state. . . . (emphasis ours)

We construe these provisions to include all oil or gas production within the state, regardless of ownership or location.

One exception to the general application of the Oil and Gas Law to federal agencies and facilities may exist. Section 259.070 (1)(d) provides that:

> The council acting through the office of the state geologist has the authority
>
> (1) To require:
>
> (D) The furnishing of a reasonable bond with good and sufficient surety, conditioned upon the full compliance with the provisions of this chapter, and the rules and regulations of the council prescribed to govern the production of oil and gas on state and private lands within the state of Missouri.

This provision may preclude the council from requiring a bond to be furnished for wells drilled or operated on federal lands. However, because this exclusionary language occurs nowhere else in

Chapter 259, we conclude that all other provisions of the statute and the rules and regulations of the council with the exception of those relating to bonds, do apply to injection well activities conducted on federal lands.

We also note that § 1447 of the Safe Drinking Water Act provides that federal agencies engaged in underground injection which could endanger drinking water sources shall be subject to and shall comply with all state requirements, both procedural and substantive, in the same manner as any non-governmental entity. This section, together with Chapter 259, gives the state sufficient authority to administer its Class II program as to federal facilities and persons on property owned or leased by the United States.

5. Effective Program to Prevent Injection Which Endangers Drinking Water Sources (SDWA § 1425)

The state program represents an effective program to prevent underground injection which endangers drinking water sources by demonstrating (1) an effective permitting process which results in enforceable permits; (2) the application of technical requirements to operators by permit or rule, (3) an effective compliance program to determine compliance with permit requirements, (4) an effective means of enforcement against violators, and (5) adequate participation by the public in the permit issuance process.

A. Effective Permitting Process

State statutes and regulations provide for an effective permitting process which results in enforceable permits by

requiring that detailed information concerning the proposed injection project be submitted prior to the issuance of a permit and by the imposition of civil penalties and injunctive relief for violations of permit conditions or the rules and regulations of the Oil and Gas Council.

Citation of Laws and Regulations

Section 259.080

Section 259.200

Section 259.210

10 CSR 50-2.010

10 CSR 50-2.020

10 CSR 50-2.030

10 CSR 50-2.040

Explanation of Authority

The state regulations provide for an effective permitting process which results in enforceable permits. Under § 259.080 and 10 CSR 50-2.030, a permit must be obtained for an injection well prior to the commencement of operations (See § I. 1., supra). A permit applicant must complete and submit a permit application (Form OGC-3I) which details the nature and operation of the proposed injection project (10 CSR 50-2.030). Regulation 10 CSR 50-2.030(1) provides that an organization report (Form OGC-1) and bond (Form OGC-2) must be on file with the state geologist or must accompany the permit application. The organization report must state the name and address of the company, organ-

ization, or individual which will carry on the oil or gas production activities. This form also requires the names and addresses of the directors and the registered agent (in the case of a corporation), or the names and addresses of all partners (in the case of a partnership). It must be signed before a notary by one authorized to act on behalf of the organization. Any change as to the facts in the organization report must be reported to the state geologist within 30 days after the change. A change of ownership of any wells of the organization shall be reported to the state geologist within 10 days of the change (10 CSR 50-2.010 (3)).

A permit applicant must also file with the state geologist a good and sufficient bond for each well or hole (10 CSR 50-2.020). No drilling or operation may commence or continue unless there is an approved bond on file with the state geologist (10 CSR 50-2.020(2)). Other components of a permit application are a location plat (Form OGC-4I) and a schematic diagram of the well (Form OGC-11).

Upon application for a permit, the state geologist shall review the application and within 15 days, determine whether the application is in proper form and whether the application meets the requirements of Chapter 259 and the rules and regulations of the Oil and Gas Council (10 CSR 50-2.030(9)). If the state geologist determines that the drilling of the well poses an undue risk to the surface or subsurface environment or that the operator has previously drilled wells that have been

abandoned and not plugged in the proper manner, he shall deny the permit (10 CSR 50-2.030(9)).

In addition to the permit requirements applicable to all wells, new or newly converted injection wells are required to demonstrate mechanical integrity prior to the commencement of operations (10 CSR 50-2.040(6)). All injection wells must demonstrate mechanical integrity every 5 years to continue operations. If a well cannot demonstrate mechanical integrity, and corrective action cannot restore mechanical integrity, then the state geologist shall order the well plugged (10 CSR 50-2.040 (10)).

Permits are not transferrable (10 CSR 50-2.030(11)). Permits may be revoked by the council after hearing, if it determines that any provision of Chapter 259, or the rules and regulations of the council or the conditions of the permit have been violated, or that any fraud, deceit, or misrepresentation was made to obtain the permit (10 CSR 50-2.030(10)). Modifications in a permitted injection project require the submission of a revised application to and approval by the office of the state geologist (10 CSR 50-2.030(14)).

Violations of the rules, regulations, or orders of the council are actionable under §§ 259.200 and 259.210. Violations are subject to a penalty of $1,000 per day for each violation and for each day that the violation continues. Section 259.210 authorizes the Attorney General to seek injunctive relief to restrain any person who is violating or threatening to violate

any provision of Chapter 259 or the rules, regulations, or orders of the Oil and Gas Council. Section 259.200.2 makes it a misdemeanor to knowingly make any false entry or statement in any report, record, account or memorandum required to be submitted by Chapter 259 or the rules, regulations, or orders of the Oil and Gas Council.

We conclude that the state regulations authorize and provide for an effective permitting process which results in enforceable permits.

B. Minimum Technical Criteria

The state has the authority to apply by permit or rule technical requirements designed to prevent the migration of injected fluids into drinking water sources.

Citation of Laws and Regulations

10 CSR 50-1.030

10 CSR 50-2.030

10 CSR 50-2.040

10 CSR 50-2.060

Explanation of Authority

1. Siting Requirements

The permit applicant is required to submit an accurate schematic diagram of the proposed injection well by 10 CSR 50-2.030 (4). This diagram must include a description of the lithography of all formations penetrated, the depth of all injection intervals and their formation names, and the geologic name and depth to bottom of all underground sources of drinking water which

may be affected by the injection. This information, together with other data supplied in the permit application (Form OGC-3I) and the location plat (Form OGC-4I) will allow the state geologist to determine if the proposed disposal zones are hydraulically isolated from drinking water sources. If the disposal zones are not isolated, then the state geologist may deny the permit as an undue risk to subsurface environment (10 CSR 50-2.030(9)).

2. Construction

Regulation 10 CSR 50-2.040(2) provides that all injection wells are required to be properly cased and cemented to prevent the movement of fluids into sources of drinking water. These specific casing and cementing requirements are based on the nature of the injected fluids and the hydraulic relationship between the injection zone and the underground source of drinking water. Under 10 CSR 50-2.040(6), all new or newly converted injection wells must demonstrate mechanical integrity prior to the commencement of operations.

3. Operation

Regulation 10 CSR 50-2.040(7) requires the state geologist to establish a maximum injection pressure for injection wells so that the pressure in the injection zone does not initiate new fractures or propagate existing fractures in the confining zone, or cause the injected fluid to migrate into underground sources of drinking water. Regulations 10 CSR 50-2.040(11) and (12) authorize the state geologist to sample injected fluids

and to monitor injection pressure. If a well cannot demonstrate mechanical integrity, then the operator must cease operations and notify the state geologist under 10 CSR 50-2.040(10). If mechanical integrity is not established within 30 days, the operator must again notify the state geologist, who may grant the operator an additional 30 days to take corrective action before ordering the well plugged.

4. Plugging and Abandonment

The state regulations require the proper plugging of wells upon abandonment. Regulation 10 CSR 50-2.060(1) provides that before beginning abandonment work, an operator must file with the state geologist a notice of intention to abandon (Form OGC-6). This form requires the operator to outline the proposed plugging procedures. Regulation 10 CSR 50-2.060(3) provides that before any well is abandoned, it shall be plugged in a manner which will permanently confine all oil, gas, and water in the strata originally containing them. Regulation 10 CSR 50-2.060(5) requires that appropriate means be taken to eliminate the movement of surface water into a plugged well and to prevent the pollution of subsurface strata. Upon the completion of plugging, Regulation 10 CSR 50-2.060(7) requires that the plugging record (Form OGC-7) be submitted to the state geologist. This form includes information on the character and depth of the well, the formations penetrated by the well, as well as a description of the plugging procedures followed and the size and kind of plugging materials used.

5. Area of Review

The state program incorporates the concept of an area of review. "Area of review" is defined in 10 CSR 50-1.030(1)(B) as "an area surrounding a single applicant well or extending from the outer perimeter of a group of applicant wells to a minimum of 1/2 mile from said well or wells and including the project area of said well or wells." The permit applicant is required to identify the area of review for an applicant injection well and to identify and describe all wells of public record in the area of review (10 CSR 50-2.030(3)).

6. Corrective Action

The state program includes the authority to require the operator to take corrective action on wells within the area of review. Regulation 10 CSR 50-2.040(6) requires that all new or newly converted injection wells demonstrate mechanical integrity prior to commencement of operations. Regulation 10 CSR 50-2.040 (9) provides that existing injection wells must demonstrate mechanical integrity within 5 years after the state's UIC program is initiated. All injection wells must demonstrate mechanical integrity every 5 years.

Regulation 10 CSR 50-2.040(10) provides that if a well cannot demonstrate mechanical integrity, the operator must cease operations and inform the state geologist. If corrective action cannot restore mechanical integrity within 30 days, the operator must again inform the state geologist. The state geologist may grant the operator an additional 30 days to take corrective action before ordering the well to be plugged.

7. Mechanical Integrity

The state program requires the demonstration of mechanical integrity of new injection wells prior to operations and of all wells at least once every 5 years (10 CSR 50-2.040(6), (9)). Under 10 CSR 50-1.030(1)(N), mechanical integrity exists if there is no significant leakage in the casing, tubing, or packer and there is no significant fluid movement into an underground source of drinking water through vertical channels adjacent to the well bore. Regulation 10 CSR 50-2.040(6) prescribes the methods by which mechanical integrity can be demonstrated. The absence of significant leaks may be shown by:

1. A pressure test with liquid or gas;
2. Monitoring of annulus pressure in wells injecting at a positive pressure following an initial pressure test; or
3. Any other test or combination of tests that the state geologist considers effective.

The absence of significant fluid movement in vertical channels adjacent to the well bore may be demonstrated by using at least two of the following procedures:

1. Cementing records;
2. Tracer surveys;
3. Noise logs;
4. Temperature surveys; or
5. Any other test or combination of tests that the state geologist considers effective.

We conclude that the state has the authority to apply technical requirements designed to prevent the migration of injection or formation fluids into underground sources of drinking water.

C. Surveillance

The authority to conduct an effective surveillance program has previously been discussed in § I. 3. (Inspection, Monitoring, Recordkeeping, and Reporting).

D. Enforcement

The state has the authority to conduct an effective enforcement program against violators.

Citation of Laws and Regulations

Section 259.200

Section 259.210

Section 557.021

Section 558.011

Section 560.016

Section 560.021

Explanation of Authority

Section 259.200 provides that civil penalties may be sought against any person who violates any provision of Chapter 259, or any rule, regulation, or order of the Oil and Gas Council, in the amount of not more than $1,000 for each act of violation and for each day that such violation continues. Section 259.200.3 provides that any person who knowingly aids or abets any other person in

the violation of any provision of Chapter 259, or the rules, regulations, or orders of the Oil and Gas Council shall be subject to the same penalty as that prescribed by Chapter 259 for the violation by such other person.

Section 259.200.2 makes it a misdemeanor to falsify, omit or destroy any report, record, memorandum, or account required by Chapter 259 or the rules, regulations, or orders of the Oil and Gas Council. Section 557.021 provides that when an offense is declared to be a midemeanor, but no penalty is specified, then the offense is a Class A misdemeanor. The punishment for a Class A misdemeanor is a term of imprisonment of up to one year (§ 558.011) and/or a fine of up to $1,000 if the offender is a person and up to $5,000 if the offender is a corporation (§§ 560.016, 560.021).

Section 259.210 provides that injunctive relief may be sought to restrain any person who is violating or threatening to violate any provision of Chapter 259 or the rules, regulations, or orders of the Oil and Gas Council. In any such action, the Circuit Court shall have the jurisdiction to grant such prohibitory or mandatory injunctions as the facts may warrant, including temporary restraining orders, preliminary injunctions, and temporary, preliminary or final orders restraining the movement or disposition of any illegal oil, gas, or product.

E. Public Participation in the Permitting Process

State regulations provide for adequate public participation in the permitting process.

Citation of Laws and Regulations

10 CSR 50-2.030

Explanation of Authority

Regulation 10 CSR 50-2.030(5) provides that a permit applicant shall publish a notice of application in a newspaper of general circulation in the county in which the injection well will be located and shall submit a copy of this notice to the state geologist. The notice shall include the name and address of the applicant, the location of the proposed well, the geologic name and depth of the injection zone, a description of the need for the injection well, and the address of the state geologist where additional information may be obtained. A 15 day writen comment period shall follow the publication of the notice. If the state geologist determines that a significant degree of public interest is expressed, he may order a public hearing. Public notice of the hearing will be made at least 30 days prior to the hearing.

II. Class I, III, IV, and V Wells

A. Class I Wells

State law prohibits the construction and use of all Class I injection wells used for the disposal of hazardous, industrial or municipal waste.

Citation of Laws and Regulations

Section 577.155, RSMo Supp. 1981

Explanation of Authority

Section 577.155.1 prohibits the construction and use of any waste disposal well located in the state. Section 577.155.2 defines "waste disposal well" as "any subsurface void porous formation or cavity, natural or artificial, used for disposal of liquid or semiaqueous waste except as excluded in subsection 3 of this section." Injection wells are defined by federal regulation as wells into which "fluids" are injected (40 CFR 146.03). Class I wells are fluid injection wells used to inject hazardous, industrial, or municipal waste beneath the lower-most formation containing an underground source of drinking water within one quarter mile of the well bore. Because Class I wells are not within any of the exceptions in § 577.155.3, we conclude that the construction or use of any Class I injection well is prohibited by § 577.155. Subsection 5 of § 577.155 provides that any violation of the provisions of § 577.155 is a misdemeanor with each day constituting a separate offense.

We note that the state provisions banning all Class I injection wells are more stringent than the federal requirements under 40 CFR 146, Subpart B, which do allow Class I injection wells when authorized by permit.

B. Class III Wells

There are currently no Class III injection wells in this state and such injections could not lawfully occur without a permit subject to effluent regulations and water quality standards for subsurface waters.

Citation of Laws and Regulations

Section 204.016

Section 204.051

10 CSR 20-6.010

10 CSR 20-7.015

10 CSR 20-7.031

Explanation of Authority

If a state can demonstrate that there are no underground injections within the state for a class of injection wells subject to the Safe Drinking Water Act and that such injections cannot legally occur until the state has developed an approved program for that class of injection, 40 CFR § 123.51(d) provides that the state need not submit a program to regulate that class of injection. At the present time, based upon the knowledge of the Department of Natural Resources, there are no Class III injection wells in the state of Missouri (See Program Description). Existing Missouri law does not completely prohibit Class III injections. Nevertheless, it is our belief that under present Missouri law, the discharge of water contaminants from Class III injection wells could not lawfully occur unless the discharger had obtained a permit from the Missouri Clean Water Commission subject to the regulations contained in 10 CSR 20-6 and 10 CSR 20-7, and that these regulations effectively prohibit any Class III injection which might endanger underground sources of drinking water.

Section 204.051.2 of the Missouri Clean Water law provides in part:

> 2. It shall be unlawful for any person to build, erect, alter, replace, operate, use or maintain any water contaminant or point source in this state that is subject to standards, rules or regulations promulgated pursuant to the provisions of sections 204.006 to 204.141 unless he holds a permit from the commission, subject to such exceptions as the commission may prescribe by rule or regulation. . . .

"Water contaminant source" is defined in § 204.016(13) as:

> [T]he point or points of discharge from a single tract of property on which is located any installation, operation or condition which includes any point source defined in sections 204.006 to 204.141 and nonpoint source under any federal water pollution control act, which causes or permits a water contaminant therefrom to enter waters of the state either directly or indirectly;

"Point source", as defined in § 204.016(6), "means any discernable, confined, and discrete conveyance, including but not limited to any . . ., well, . . . from which pollutants are or may be discharged." Finally, "waters of the state" is defined in § 204.016(15) as "all rivers, streams, lakes, and other bodies of surface or subsurface water. . . ."

Reading these provisions together we conclude that it is unlawful under § 204.051.2 to build, erect, alter, replace, operate, use, or maintain any well which discharges or may discharge pollutants into subsurface waters and which is subject to standards, rules or regulations of the Clean Water Commission, unless a permit to do so has been obtained from the Commission. We also believe that a Class III injection well is a point source that is subject to standards, rules and regulations, and that construction or operation of a Class III injection well would require a permit from the Commission.

Regulation 10 CSR 20-6.010(1)(A) describes who must apply for a permit:

> (A) All persons who build, erect, alter replace, operate, use, or maintain existing or proposed point sources, water contaminant sources or wastewater treatment facilities shall apply to the department for the permits required by the Missouri Clean Water Law and these regulations. The department shall issue these permits in order to enforce the Missouri Clean Water Law and regulations and administer the NPDES program.

Regulation 10 CSR 20-6.010(1)(B) identifies sources which are exempt from the permit requirement:

> (B) The following are exempt from permit regulations:
>
> 1. Nonpoint source discharges;
>
> 2. Service connections to sewer systems;
>
> 3. Internal plumbing and piping or other water diversion or retention structures within a manufacturing or industrial plant or mine, which are an integral part of the industrial or manufacturing process or building, or mining operation. An operating permit or general permit shall be required, if such piping, plumbing, or structures result in a discharge to waters of the state;
>
> 4. Routine maintenance or repairs of any existing sewer system, wastewater treatment facility, or other water contaminant or point source;
>
> 5. Single family residences; and
>
> 6. Separate storm sewers are subject only to the general permit requirements.

Reading these two provisions together, we conclude that all water contaminant sources, point sources and wastewater treat-

ment facilities which are not specifically exempted in subparagraph (B) are required to be permitted. Because Class III injection wells are point sources and do not fall within any of the six exemptions in subparagraph (B), a permit must be obtained for the construction or operation of a Class III injection well.

The regulations in 10 CSR 20-7 describe the water quality standards and effluent regulations for the waters of the state. The effluent regulations for subsurface water are contained in 10 CSR 20-7.015(2):

> (2) Subsurface Waters
>
> (A) No person shall release any wastewater into aquifers, or store or dispose of such wastewater in a way which causes or permits it to enter aquifers either directly or indirectly unless it meets the requirement set out in Appendix II of this rule.*
>
> (B) No wastewater shall be introduced into sinkholes, caves, fissures, or other openings in the ground which do or are reasonably certain to drain into aquifers except as provided in paragraph (3)(B)3. of this rule.**

Water quality standards for ground water are contained in 10 CSR 20-7.031. General water quality criteria are described in 10 CSR 20-7.031(3):

> (3) General Criteria: The following water quality criteria shall be applicable to all waters of the state at all times. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from being--

---

* Appendix II is reprinted in Table I.
** 10 CSR 20-7.015(3)(B)3 is reprinted in Table II.

(A) free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits, or interfere with beneficial uses;

(B) free from oil, scum, and floating debris in sufficient amounts to be unsightly or interfere with beneficial uses;

(C) free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or taste, or interfere with beneficial uses; and

(D) free from substances or conditions that have a harmful effect on human, animal, or acquatic life.

"Beneficial uses", as mentioned in 10 CSR 20-7.031(3)(A), (B), and (C), includes drinking water supplies (See definitions, 10 CSR 20-7.031(1)(B)6). Thus, any release of a water contaminant so as to interfere with the use of subsurface water as a drinking water source is proscribed by 10 CSR 20-7.031(3). More specific water quality standards for subsurface waters are prescribed in 10 CSR 20-7.031(5).***

Based upon these regulations, the Clean Water Commission has the authority to require the permitting of Class III injection wells if and when such activities appear in the State of Missouri. The present statutory and regulatory restrictions do not act as a complete ban on all Class III injections, however, the effluent regulations and the water quality standards do allow the Commission to impose stringent conditions on any permit which might be issued so as to insure the integrity of underground sources of drinking water. We conclude that there are presently no Class

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*** 10 CSR 20-7.031(5) is reprinted in Table III.

III injection wells in Missouri and that such injections could not lawfully occur without a permit from the Clean Water Commission, subject to the effluent regulations and water quality standards contained in 10 CSR 20-7.

TABLE I

Appendix II--Aquifer water recharge:

This section shall apply to percolating water from all areas of land on which wastes or wastewater is applied or allowed to accumulate. Such percolating water shall be considered an effluent to aquifers and subject to the following requirements when it reaches a depth at which additional attenuation of pollutants is not expected before entering an aquifer. This depth shall be established by the department using best engineering judgement. Monitoring of percolating water may be required at varying depths to determine the rate and direction of flow and pollutant concentration.

(Values are in micrograms per liter unless noted otherwise.) (ug/l). (All metals are dissolved metals unless noted otherwise.)

Selenium	10 ug/l
Zinc	100 ug/l
COD	10 mg/l
Threshold Odor Number (TON)	3
Linear Alkylate Sulfonates	1.0 mg/l
Chlorides	250 mg/l
Sulfates	250 mg/l
Total dissolved solids	500 mg/l
Nitrate as (N)	10 mg/l
Arsenic	50 ug/l
Barium	1,000 ug/l
Beryllium	100 ug/l
Boron	750 ug/l
Cadmium	10 ug/l
Chromium (Total)	50 ug/l
Cobalt	1,000 ug/l
Copper	20 ug/l
Chloride	10 ug/l
Cyanide	5 ug/l
Fluoride	2,000 ug/l
Lead	50 ug/l
Manganese	50 ug/l
Mercury	0.05 ug/l
Nickel	100 ug/l
Phenols	1 ug/l
pH	6.0-9.0

TABLE II

3. Discharges to losing streams shall not be permitted unless an engineer shows the department that effluent removal is not technically feasible as determined by best available technology, as defined in 301(b) of the Federal Clean Water Act; and that the discharge will not cause the losing stream to exceed the limitations in Appendix II at the point where the losing stream enters an aquifer. If the department agrees to allow a release to a losing stream, its limits shall be--

A. BOD_5 equal to or less than a monthly average of ten (10) mg/l and a weekly average of fifteen (15) mg/l;

B. Suspended Solids equal to or less than a monthly average of fifteen (15) mg/l and a weekly average of twenty (20) mg/l; and

C. pH at 6.0-9.0.

TABLE III

(5) Ground water: Water contaminants shall not cause the following concentrations to be exceeded in waters in aquifers and caves: (All metals are dissolved metals unless otherwise noted).

Arsenic	50 ug/l
Barium	1000 ug/l
Beryllium	100 ug/l
Boron	750 ug/l
Chromium (Total)	50 ug/l
Cobalt	1000 ug/l
Cadmium	1.2 ug/l
for ground water contributing to cold-water streams,	
Cadmium	10 ug/l
for other streams	
Chlorine	10 ug/l
Copper	20 ug/l
Cyanide	5 ug/l
Manganese	50 ug/l
Nickel	100 ug/l
Selenium	10 ug/l
Phenol	1 ug/l
Mercury	.05 ug/l
Zinc	100 ug/l
Lead	50 ug/l
Nitrate-Nitrogen	10 mg/l
	(10,000 ug/l)
Fluoride	2 mg/l
	(2,000 ug/l)
pH	6.5-9.0

Where natural concentrations for any constituent are higher than these limits, the concentration may not be increased. Pesticide limits for ground water shall be the same as for surface waters. Ground water concentration of dissolved solids, chloride, sulfate, and iron are variable; any additions of these to ground water shall be such that beneficial uses are not impaired.

C. Class IV Wells

State law prohibits the construction and use of all Class IV injection wells used for the disposal of hazardous or radioactive waste.

Citation of Laws and Regulations

Section 577.155, RSMo Supp. 1981

Explanation of Authority

Section 577.155 prohibits the construction and use of all waste disposal wells not specifically exempted in subsection 3 of § 577.155. Class IV injection wells (wells used to dispose of hazardous or radioactive waste into or above a formation which contains an underground source of drinking water within one quarter of a mile) are waste disposal wells and do not fall within any of the exempted categories. Therefore, we conclude that Class IV injection wells are prohibited in the state (see also, II.A. Class I wells, supra).

D. Class V Wells

State law requires the permitting of ground water heat pump injection/withdrawal wells that serve nine or more single family residences or that serve more than one single family residence if the combined injection/withdrawal rate is 600,000 BTU/hour or greater.

Citation of Laws and Regulations

Section 204.026

Section 204.051

Section 204.056

Section 204.076

Section 577.155, RSMo Supp. 1981

10 CSR 20-2.010

10 CSR 20-6.070

Explanation of Authority

Class V includes a large class of wells not included in the other categories and regulation of these wells is accomplished by two different statutes depending upon the type of well. Wells in Class V which may be categorized as waste disposal wells are prohibited by § 577.155 (see Parts II.A. Class I Wells and II.D. Class IV Wells, supra). Wells which discharge contaminants to subsurface waters, but which are not waste disposal wells, are subject to the provisions of the Missouri Clean Water Law, Chapter 204. These wells would require a permit for construction and operation, subject to the effluent regulations and water quality standards for subsurface waters (see II.B. Class III Wells, supra).

This discussion will be limited to a consideration of the one type of Class V well addressed in the Missouri program, heat pump return flow injection wells. This type of Class V is regulated by both § 577.155 and Chapter 204, as well as the rules and regulations of the Missouri Clean Water Commission.

Section 577.155.1 provides that it shall be unlawful to construct or use any waste disposal well located in the state. Section 577.155.4(2) provides that:

> 4. It shall not be a violation of this section to:
>
> ***
>
> (2) Inject or return water into subsurface formations pursuant to chapter 204, RSMo, and section 192.020, RSMo, in connection with the following instances:
>
> (a) Any groundwater heat pump injection/withdrawal well that is limited to a single family residence;
>
> (b) Any groundwater heat pump injection/withdrawal well that is limited to eight or less single family residences as long as the combined injection/withdrawal rate is less than six hundred thousand British Thermal Units per hour;
>
> (c) All other uses of groundwater heat pump injection/withdrawal wells shall be subject to a permitting procedure as established and regulated by the clean water commission;

Pursuant to § 577.155.4(2)(c), the Missouri Clean Water Commission has promulgated rules and regulations to permit groundwater heat pump injection/withdrawal wells. Regulation 10 CSR 20-6.070(1)(B) provides that:

> (B) All persons who build, erect, alter replace, operate, use or maintain existing or proposed ground water heat pump injection/withdrawal wells shall apply to the department for the permits required by section 577.155 RSMo (Supp. 1980) and these regulations. The department shall issue these permits in order to enforce section 577.155 RSMo (Supp. 1980) and the Missouri Clean Water Law and regulations.

"Persons", as defined in 10 CSR 20-2.010(26) includes:

> Any individual, partnership, co-partnership, firm, company, public or private

> corporation, association, joint stock company, trust, estate, political subdivision, or any agency, board, department, or bureau of the state or federal government, or any other legal entity whatever, which is recognized by law as the subject of rights and duties.

Regulation 10 CSR 20-6.070(1)(A) exempts from this permit requirement any ground water heat pump injection/withdrawal well that is limited to a single family residence or that is limited to eight or fewer single family residences as long as the combined injection/withdrawal rate is less than six hundred thousand British Thermal Units per hour.

Regulation 10 CSR 20-6.070(2)(B) requires that the permit applicant submit the following information:

(1) The name and address of the company, organization, owner, or operator of the injection/withdrawal well;

(2) Description of the structure and or process that will utilize the injection/withdrawal well;

(3) Estimated depth of the well, the aquifer to be used, the casing and related well construction data as recommended by the state geologist;

(4) The exact location of the well;

(5) The maximum, minimum, and average daily volume of water that will be injected and withdrawn;

(6) The maximum, minimum, and average temperature differentials and how they were calculated;

(7) General specifications of the installation including the heat exchange unit, pump, and other structures; and

(8) A registered professional engineer's recommendation and justification on the number and location of sampling wells.

The Department of Natural Resources shall specify in the operating permit the maximum temperature differential allowed at two hundred (200) feet from the injection/withdrawal site and shall also specify the minimum number and location of sampling wells to be constructed (10 CSR 20-6.070(3)(D) and (E)). Permits are issued subject to the terms and conditions enumerated in 10 CSR 20-6.070(4). The terms and conditions include:

(1) The permittee shall operate and maintain the facility in accordance with § 577.155, Chapter 204, the rules and regulations of the Clean Water Commission, and the permit conditions;

(2) The permittee shall allow entry and inspection of the facilities by authorized representatives of the Department of Natural Resources and shall allow such representatives access to any records required to be kept by the terms and conditions of the permit;

(3) The permittee shall notify the Department of Natural Resources of any new or substantially different injection/withdrawal process sixty (60) days before the modification begins;

(4) The permittee shall provide the Department of Natural Resources with copies of the well location, driller's logs, sample logs, casing schedule, volume of water, temperature, water quality, and other information developed or determined for the completed installation;

(5) The permittee shall measure and record monthly for each well:

a. The maximum, minimum, and average water temperature.

b. The maximum, minimum and average injection/withdrawal rate.

c. The total dissolved solids.

(6) The permittee shall submit an annual report which contains:

a. The volume of water withdrawn and injected.

b. Temperature records for each monitoring well.

c. Copies of water quality analyses performed.

Permits are issued only for thermal discharges (10 CSR 20-6.070(5)(C)). Should a pollutant discharge other than a thermal discharge occur, it would be actionable as a violation of permit conditions under § 204.051.1(3). Furthermore, any pollution of subsurface waters caused by the discharge of water contaminants from a heat pump injection/withdrawal well would be unlawful under § 204.051.1(1).

The Clean Water Commission has the authority under § 204.026(9) to:

> Issue, modify, or revoke orders prohibiting or abating discharges of water contaminants into the waters of the state or adopting other remedial measures to prevent, control or abate pollution.

Corrective action is also authorized by § 204.056.3, which provides in part:

> In case of the failure by conference, conciliation or persuasion to correct or remedy any claimed violation, or as required to immediately and effectively halt or eliminate any imminent or substantial endangerments to the health or welfare of persons resulting from the discharge of pollutants, the executive secretary shall order abatement or file an abatement complaint with the commission if no permit has been issued, or in addition may file a complaint to revoke a permit if such permit has been issued. . . . The commission may sustain, reverse, or modify the executive secretary's order or may make such other orders as the commission deems appropriate under the circumstances. . . .

Thus, we believe that the Commission has the authority to order corrective action if a heat pump injection/withdrawal well threatens to pollute an underground source of drinking water. In addition, under § 204.076.1, injunctive relief may be sought to prevent the violation or further violation of any provision of Chapter 204, the rules, regulations or orders of the Clean Water Commission, the condition of any permit issued by the Commission, or any other provision which the state is required to enforce under any federal water pollution control act.