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ENVIRONMENTAL REGULATIONS HANDBOOK FOR ENHANCED OIL RECOVERY

By
Michael P. Madden, NIPER
Robert F. Blatchford, Spears and Associates, Inc.
Richard B. Spears, Spears and Associates, Inc.

December 1991

Performed Under Cooperative Agreement No. DE-FC22-83FE60149

IIT Research Institute
National Institute for Petroleum and Energy Research
Bartlesville, Oklahoma

Bartlesville Project Office
U. S. DEPARTMENT OF ENERGY
Bartlesville, Oklahoma

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Prepared for
U.S. Department of Energy
Assistant Secretary for Fossil Energy

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PREFACE

This revised edition of the "Environmental Regulations Handbook for Enhanced Oil Recovery" was prepared for the U.S. Department of Energy via contract through the National Institute for Petroleum and Energy Research. The contents of this handbook were assembled by Spears and Associates of Tulsa, Oklahoma.

Environmental regulations that were extracted and summarized from every state included in this manual, were reviewed for accuracy and adequacy by a representative of each agency mentioned as the "Agency in Charge". All federal amended laws and regulations mentioned in the text are those currently in effect. However, the Clean Water Act which was amended in April, 1991, was not available as of this date (July 23, 1991).

The project manager for this revision and the consultant who compiled the information contained herein, retain responsibility for any errors in judgement or fact.

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Vice President & Project Manager

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INTRODUCTION

This handbook is intended to assist owners and operators of enhanced oil recovery (EOR) operations in acquiring some introductory knowledge of the various state agencies, the U.S. Environmental Protection Agency, and the many environmental laws, rules and regulations which can have jurisdiction over their permitting and compliance activities. It is a compendium of summarizations of environmental rules. It is not intended to give readers specific working details of what is required from them, nor can it be used in that manner. Readers of this handbook are encouraged to contact environmental control offices nearest to locations of interest for current regulations affecting them.

Enhanced oil recovery is often known in the oil industry as tertiary recovery. However, because it is more commonly called enhanced oil recovery in various environmental laws, rules and regulations, that is the term used in this text. "Tertiary recovery" is any method used to recover more oil from a petroleum reservoir than would be feasible using primary or secondary recovery methods.

In primary recovery, naturally occurring forces (such as those associated with gas and liquid expansion or influx of water from aquifers) are utilized to produce oil. Primary recovery is often termed "free flowing" and is extended to include pumping assistance, when describing a well using this method of production. Conventional, secondary recovery methods, such as

waterfloods (in which water is injected to supplement original reservoir forces and sweep more oil to producing wells), are not considered to be enhanced oil recovery under this definition.

There are three major EOR processes: 1) Thermal, which comprises two alternate methods -- steam injection and in-situ combustion; 2) Chemical injection; and 3) Gas flooding processes. In general, these processes are usually not implemented until a well or reservoir has ceased to produce oil economically through primary or secondary recovery techniques. Enhanced oil recovery is used only in existing or abandoned wells, reservoirs and fields. Therefore, no effort was made to identify and summarize environmental laws, rules and regulations covering exploration, drilling, and primary or secondary recovery operations per se. This handbook is focused on those laws and regulations that specifically apply to EOR, especially considering emissions from steam generators and underground injection of chemicals.

The U.S. Environmental Protection Agency (EPA) is the primary generator of environmental laws, rules and regulations for the United States of America. Its acts, which are ultimately enacted into law by Congress, are intended to control or prevent pollution of the environment. Their spheres of interest include:

1. Air Pollution Control:

   The Clean Air Act, amended through November 15, 1990, and corresponding state laws, and federal and state regulations.

2. Water Pollution Control:

The Clean Water Act, amended through May 2, 1989, and corresponding state laws, and federal and state regulations. This includes oil and hazardous substance spill notification and clean-up requirements.

3. Protection of Underground Water:

The Safe Drinking Water Act, amended through December 20, 1989, for underground injection control. States may apply these regulations through water pollution control programs or drinking water programs.

4. Solid Waste Management:

The Resource Conservation and Recovery Act and federal regulations. States' regulations vary considerably, but none of the oil and gas producing states listed in this handbook have regulations less stringent than federal standards.

Primary EPA environmental concerns for EOR methods listed in Table I-1 are cross referenced to indicate issues or activities EOR operators need to be especially aware of to avoid conflict with regulatory agencies at state and federal levels of authority. A majority of concerns directly involve the effect of EOR activity on fresh water demand and protection. Although solid waste disposal is shown to be of lesser concern to EOR operators, it is an issue of increasing importance, especially the disposal of water treatment wastes and chemicals.

Table I-1

Primary Environmental Concerns
(by process)

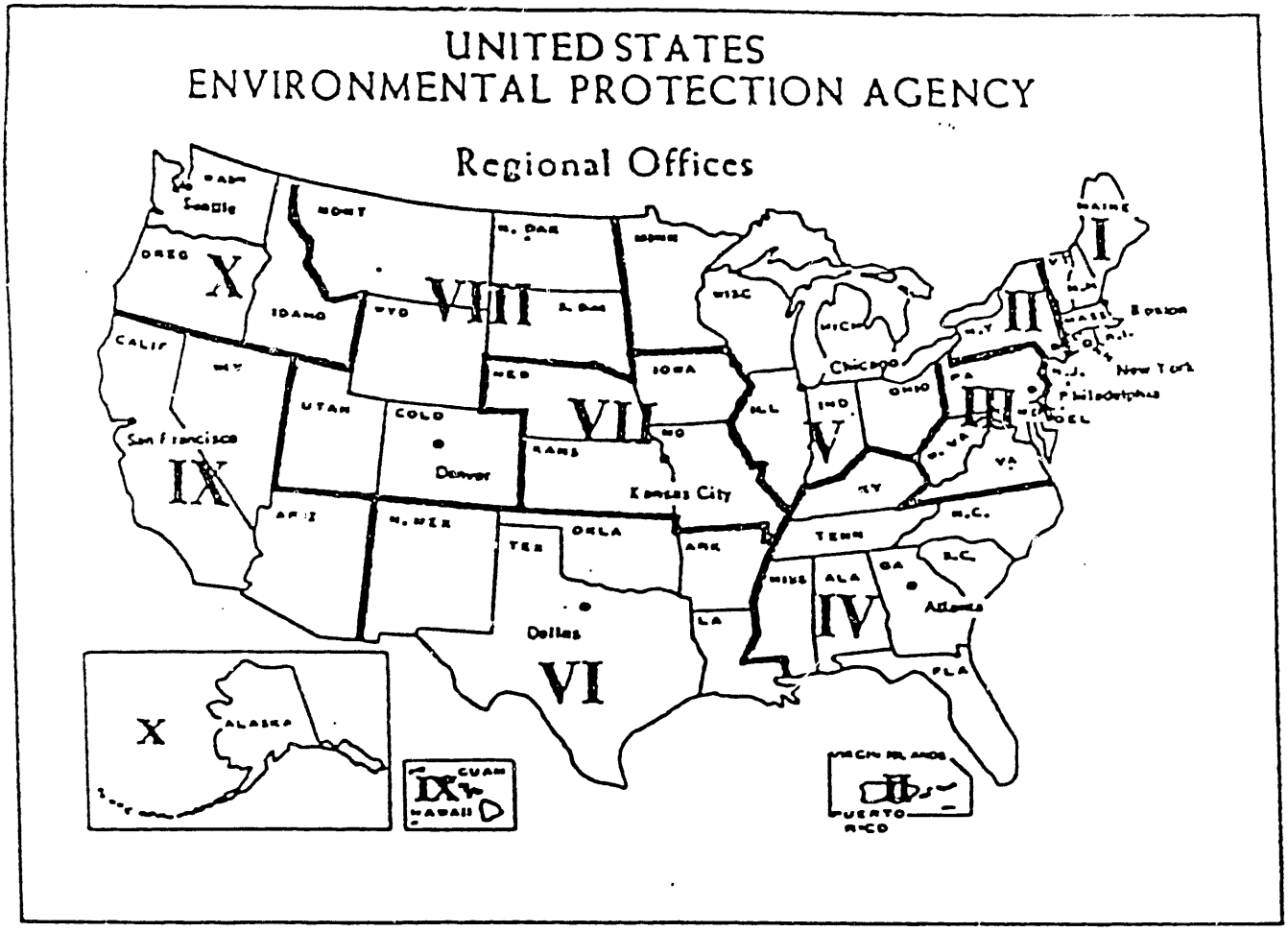
	STEAM INJECTION	IN SITU COMBUSTION	CHEMICAL FLOODING	CO_2 INJECTION
AIR	• SO_2, NO_X, AND PM_{10} EMISSIONS FROM STEAM GENERATORS	• *HC and CO emissions from wells*	• *Fugitive emissions from on-site manufacture of chemicals*	• *Leaks of CO_2 in process use or transport*
	• *Wellhead emissions of HC*	• *SO_2, NO_x, TSP emissions from air compressors*		• *H_2S emissions from wells*
WATER USE	• SIGNIFICANT WATER DEMAND	• *Moderate water demand in wet combustion process*	• SIGNIFICANT WATER DEMAND	• SIGNIFICANT WATER DEMAND
WATER EFFLUENTS	• DISPOSAL OF PRODUCED WATER	• DISPOSAL OF PRODUCED WATER	• AQUIFER CONTAMINATION FROM INJECTED CHEMICALS	• DISPOSAL OF PRODUCED WATER
		• *Aquifer contamination from low pH water with trace metals resulting from corrosion of well casings*	• DISPOSAL OF PRODUCED WATER • *Spills/leaks of chemicals to surface waters*	• *Aquifer contamination from low pH water and corrosion of well casings*
SOLID WASTE	• *Disposal of scrubber sludges*	• *Disposal of wastes from wellhead gas cleaning*	• *Disposal of wastes from on-site chemical manufacture*	• *Disposal of water treatment wastes*
	• *Disposal of water treatment wastes*	• *Disposal of water treatment wastes*	• *Disposal of water treatment wastes*	

*Capital letters indicate major environmental issues; italics indicate environmental issues of lesser concern.

EOR operators need to be aware of the following conditions during the planning phase of their projects. Special rules are, or may be, applied in certain places such as coastal areas, wetlands, habitats of endangered species, or on federal or Indian lands. Generally, environmental restrictions are more stringent in those areas with regard to facility location and construction or method of recovery. EOR operations on lands administered by a federal agency such as the U.S. Geological Survey, Corps of Engineers or the Bureau of Indian Affairs may be cause for the preparation of an environmental impact statement (required by the National Environmental Policy Act).

This handbook is designed to be primarily a reference source for use in planning EOR projects. It is current as of this writing. However, users need to be made aware of the fact that federal and states' environmental protection laws, rules and regulations are constantly being changed. It is for that reason, that effective dates are cited with references listed in the Appendix.

Users of this handbook are admonished to directly contact regulatory agencies in the states where they plan to initiate enhanced oil recovery projects, to obtain current specific working details of permitting and compliance requirements. They are also urged to contact appropriate federal agencies, especially the nearest regional EPA office. Current addresses and telephone numbers of regional EPA offices are indicated on the following page.



REGION I
John F. Kennedy Federal Bldg.
Room 2203
Boston, MA 02203
617/223-7210

REGION II
26 Federal Plaza
New York, NY 10278
212/264-2525

REGION III
841 Chestnut Building
Philadelphia, PA 19107
215/597-9814

REGION IV
345 Courtland Street, N.E.
Atlanta, GA 30365
404/347-3004

REGION V
230 South Dearborn Street
Chicago, IL 60604
312/353-2000

REGION VI
First International Building
1445 Ross Avenue
Dallas, TX 75202
214/655-6444

REGION VII
726 Minnesota Avenue
Kansas City, KS 66101
913/551-7000

REGION VIII
999 18th Street
One Denver Place
Denver, CO 80202
303/293-1603

REGION IX
75 Hawthorne Street
San Francisco, CA 94105
415/744-1500

REGION X
1200 6th Avenue
Seattle, WA 98101
206/553-1220

FIGURE NO. 1

The fifteen (15) states included in this handbook comprise the major oil producing states in the lower 48 contiguous states. There are other oil and gas producing states that may be of interest to EOR operators. It is suggested that the regulations in those states are not vastly different from the fifteen states contained in this handbook. Users of this handbook who need information on states not included in it should contact the nearest regional EPA office for leads toward approaching proper state agencies for their environmental protection regulations affecting enhanced oil recovery activity.

Another source for preliminary leads is the Interstate Oil Compact Commission:

900 Northeast 23rd Street
P.O. Box 53127
Oklahoma City, OK 73152
405/525-3556

1. GENERAL GUIDELINES FOR COMPLYING WITH ENVIRONMENTAL LAWS AND REGULATIONS

Although there are many different laws and government agencies administering environmental programs with differences from one state to another in the details of the laws and procedures, the overall pattern of administering environmental laws is uniform throughout the country. As an introduction to the detailed sections of the handbook, this chapter describes the general procedures for obtaining environmental permits, and offers some general pointers about post-construction compliance and enforcement. A special note at the end of the chapter explains how federal and state programs overlap.

1.1 Obtaining an Environmental Permit

Step 1. Define Your Operation

The specific type of operation you plan to conduct will determine which permits you may need, and how much time you should allow from project conception to actual operation. For example, a chemical recovery process may involve handling, use, and disposal of chemicals that are very strictly regulated. A thermal recovery project, on the other hand, will have little or no solid waste to dispose of, but will generate significant amounts of air pollution. The more precisely you can define the project at the start (e.g., which chemicals you will use; what size compressor you will need) the better you will be able to focus on the relevant laws and permits.

Step 2. Identify the Facility Site

Because environmental laws are designed to protect the quality of the environment and because environmental conditions vary from place to place, the permits you will need and the conditions for obtaining them will depend on the site you choose. If you have several alternative sites, or if you have simply defined a general area within which you want to operate, you should use environmental conditions and permit requirements as one of your criteria for selecting a specific site. An operation that is unacceptable at one site may be acceptable at another site only a short distance away. Air quality, for example, can be extremely variable.

Step 3. Survey Environmental Conditions at the Candidate Site(s)

A quick survey of environmental conditions will identify critical problem areas before you make any substantial investments. The types of information to look for at this time include general descriptions of air and water quality, hydrological factors affecting injection for reservoir pressure maintenance and/or waste disposal, special topographic features (e.g., wetlands, floodplains), special land areas in the vicinity (e.g., natural preserves, federally-owned lands), and similar characteristics that might entail extraordinary environmental standards or permit procedures.

Step 4. Identify the Permits You Will Require

Steps 1-3 may not actually occur in sequence. Rather, they are three of the elements in the environmental evaluation of site and operational feasibility. Once you have identified a site or small number of sites and determined the operating mode, you are prepared to identify the specific permits you will require. This handbook will be useful as a starting point for

this step, but it will be important to verify current requirements with the regulatory agencies before proceeding further in your planning. Keep the following considerations in mind when identifying permits you will need to obtain:

a. Review potential requirements for every aspect of your operation that "pollutes" or modifies the natural environment: air pollution (including on-site storage of oil or volatile chemicals), wastewater streams, anything injected into a well for either production or waste disposal, surface and subsurface construction, and surface transport (trucks and roads, pipelines). Some details (e.g., roads) may not be covered by state or federal law but will probably be subject to municipal or county permits.

b. Review both federal and state requirements. An operator may even need permits from both the federal and state governments for the same discharge. If the facility site is on federal lands, be sure to identify permit requirements established for that area by the agency in charge in addition to the general environmental laws described in this handbook.

Step 5. Establish Direct Contact with the Permitting Agencies

Early contact with the agencies responsible for granting your permits has several benefits:

1. You can quickly learn the latest requirements and any pending changes.
2. You can clear up confusing requirements or verify directly whether your facility needs a certain permit.

3. You can obtain permit application forms and discuss with agency staff exactly what types of information you need to provide in the application.
4. You establish your "good faith" interest in complying with their rules.
5. You may be able to develop a personal contact who can help you smooth out any administrative problems.
6. You can avoid being surprised by requirements that do not appear clearly in the law.
7. You have an opportunity to describe your facility in favorable terms, before any person who may oppose your plans goes to the agency.
8. You can make early changes in your plans to avoid certain requirements or to comply with new rules, or rules that the agency is just starting to develop.

Step 6. Identify the Environmental, Engineering, or Other Studies You Will Need to Perform

Pay very close attention to the information required to obtain each permit. A common frustrating experience that many permit applicants experience is to be told by an agency at the last minute that they need to undertake an environmental study to answer a particular question. Careful reading of permit applications and discussions with agency staff should enable you to identify your environmental requirements early in the process so that you have adequate time to perform them without delaying your project.

Step 7. Initiate the Necessary Studies

For some facilities, the environmental studies will take one or two years to complete. A case in point for many EOR facilities is ambient air quality monitoring. The U.S. EPA requires a full year of monitoring data for a pre-construction permit application, which means that planning for monitoring must begin about two years before the expected date for starting construction.

Step 8. Complete the Permit Applications

Once you have collected all the required information, you are ready to complete the application forms. Usually there is no advantage in filing applications far in advance of the deadline; in fact, some permits become invalid if they are not "used" within a certain time. On the other hand, if the expected review time is, for example, 6 months, submitting the application 9 to 12 months before construction will provide a cushion for bureaucratic delay and negotiation of disputed terms or appeals from adverse agency decisions.

Step 9. Stay in Touch With the Agency

By staying in touch periodically with the person assigned to review your application, you keep his or her attention on your case. You also confirm to the agency your genuine interest and time constraints.

Periodic contact is also the best way to uncover any disputed issues while there is still time to resolve them by supplying more information or by negotiation. Keep a record of your telephone calls, meetings and correspondence -- it may be helpful if there is opposition to your facility either inside or outside the agency.

Step 10. Take Advantage of Your Procedural Rights

The typical agency procedure for reviewing and deciding on a permit application is as follows:

1. Application submitted.
2. Application reviewed for completeness; applicant notified if application is complete or if more information is required.
3. Agency makes a tentative (or proposed) decision to grant or deny permit, or to grant it under certain conditions.
4. Agency gives public notice of its tentative decision (including notice to the applicant). Some types of permits require specific notice to adjacent property owners.
5. On request, agency holds a public hearing to hear the comments and criticisms of the applicant and any project supporters or opponents.
6. Agency reviews written comments and remarks made at hearing and reaches a final decision.
7. Agency notifies applicant and other interested parties of final decision.
8. Within a certain time after the final decision, any interested party (including the applicant) can appeal the agency decision through an established administrative appeal process.
9. Appeals board (commission, examiner, etc.) conducts hearing (usually like a trial) and upholds or overturns any agency decision.
10. Finally, parties may take their case to state or federal court to seek "judicial review" of the final decision after appeal.

The permit applicant has the same rights as any other person to request hearings, appeal agency decisions, or to seek judicial review by the courts. If you think the agency misunderstands the project, misinterprets the law, or treats you unfairly, use your procedural rights to get opportunities to present your side of the story. In many systems, your right to appeal or your right to judicial review depends on using all your earlier opportunities to make your point.

1.2 Compliance and Enforcement

Theoretically, compliance with environmental regulations is a simple matter. The permit you receive will specify the operating standards you must achieve and any other conditions, limitations, or requirements. As long as you abide by the permit, you will be in compliance. In the real world, however, a number of common problems and questions arise that can be answered generally for all states and the federal agencies.

1.2.1 Compliance

Upsets, Equipment Failure, Etc.

Most environmental laws impose "strict liability" on the facility, which means that the government is legally justified in penalizing every violation, regardless of size or fault.

Permits may or may not expressly provide for minor violations due to occasional situations. If your permit does not make any provision, the general administrative practice is to excuse occasional violations due to circumstances beyond the operator's reasonable control. However, if your

negligence contributed to the violation or if your facility has a record of problems, enforcement will probably be stricter.

Changes in the Facility or Its Operation

Generally, a permit to construct, discharge, or operate is specific to the location, facility design, and method of operation identified in the permit application. Any significant changes from the operation so described will probably require a modification of the permit or a completely new permit, unless the level of discharge is being reduced. Your permit or the specific procedural rules of the agency may also specify when you must give notice to the agency of any changes in the facility or its operation. Relocation of the facility also usually requires a new permit.

Changes in Laws and Regulations

Your permits will generally insulate you from changes in the "rules of the game". There are several important exceptions to this general statement, however. Foremost is the fact that most permits are issued for fixed periods (5 years is common). At the end of that period, you must apply for a permit renewal, and the agencies may use that opportunity to introduce any new legal requirements. Most permit programs also allow the permit to be revoked or modified at any time for various specified reasons. For example, a wastewater discharge containing toxic compounds is subject at any time to new controls on the toxics. Frequent violation of the permit is normally grounds for revoking it.

1.2.2 Enforcement

Monitoring, Recordkeeping, and Reporting

More often than not, a permit will require monitoring of environmental conditions, the keeping of certain records, and periodic reporting to the agency. The U.S. EPA and most state agencies take these requirements seriously, because they rely on self-monitoring and self-reporting to identify trouble spots. The few criminal convictions that EPA has obtained for violation of environmental laws have involved failures to report activities, falsification of monitoring data, and similar infractions. Close adherence to these requirements will stand you in good stead should you become involved in more substantial problems with the agency.

Reporting Spills

A special reporting requirement in the Clean Water Act applies to spills of oil or hazardous substances. Most states have a similar law. Under federal law, any spill of oil (or any spill above specified amounts of over 300 listed substances) that reaches or may reach surface water must be reported immediately after it is discovered to the EPA or the Coast Guard. The source of the spill will be liable for a moderate penalty ($500 - $5,000) in addition to all costs of clean-up or containment.

Inspections

Virtually every environmental law authorizes state or federal officials to inspect your facility and your operational records during business hours. (They are also authorized to enter your facility at any time to take emergency measures to protect the environment or the public health.) Although the Supreme Court has ruled that OSHA inspections cannot be conducted against

the owner's will without a warrant, the decision may not apply to environmental laws. In any case, such warrants will be routinely issued because of the broad authority granted to these agencies.

Enforcement Against Violations; Penalties

The environmental laws usually allow an agency to choose between suing a violator immediately in court and issuing some type of administrative order to the violator to correct the violation. In practice, agencies almost always use the administrative order approach, if only because litigation is time-consuming and expensive. In fact, many agencies prefer to use informal negotiations rather than formal orders to obtain compliance. This is especially true at the state level; as a rule, EPA prefers the formal approach.

For minor violations, the agencies usually seek simply to have the problem corrected. More significant violations, or repeated violations, will probably also result in a civil penalty. A civil penalty, which the agency can collect just by proving the violation, is designed to compensate for the environmental damage that occurred. It carries no implication that the source acted criminally; criminal penalties are separately authorized and can be imposed only after a court conviction.

The statutes often authorize enormous civil penalties, such as $25,000 per day. Don't be alarmed; penalties of that size are reserved for the largest corporations and the worst violations. More routinely, penalties for small facilities will vary from about $500 to almost $10,000 for the entire violation, depending on how long it lasted, how serious the environmental harm was,

and how much money the violator saved by allowing the violation to occur. The compliance record of the violator, his efforts to correct the violation, and his general attitude toward the agency will also influence the amount of the penalty. If you feel strongly that the amount of the penalty that the agency is asking for is too high, you may insist on bringing the whole case to court and having the judge set the penalty.

Final authority for all enforcement matters lies with the courts. If you disagree with an agency about whether the violation occurred, about the corrective measures to prevent further violations, or about the penalties or other sanctions they seek, either you or the agency may bring the matter to court to be decided by the judge or a jury, as the case may be. The agency usually has the choice of going directly to the court without notifying you in advance.

1.3 A Note on Federal-State Relations

1.3.1 General Discussion

The American political system relies on the state to attend to most domestic affairs of government. The Constitution limits the authority of the national government to specific matters of national importance that transcend state boundaries. As our society has grown in complexity and our economy has become increasingly national, the power of the federal government has expanded relative to the power of the states. Nevertheless, for reasons of constitutional law and political tradition, the importance of individual state choice and control remains a basic tenet of our political and legal system.

Environmental degradation clearly is a problem of national, even global dimensions. Pollution recognizes no political boundaries, but crosses unhindered from one state to the next. Consequently, the major response to our environmental problems originated at the federal level. In the 1960s, Congress passed laws to control air and water pollution. After the great awakening of environmental concern around 1970, Congress made major changes in the air and water pollution control laws and added new laws governing drinking water, noise, and solid waste. Because of the national scope of the problems, Congress established national control programs for each concern and assigned their administration to the Environmental Protection Agency (EPA). At the same time, Congress recognized that each state had its own interests in the protection of the environment within the state and in the mix of industry and commerce it desired. Therefore, each of these federal laws provides that the states may assume the administration of the pollution control programs once they have enacted the necessary state laws and regulations. To assure that the states will not compete for industrial development by offering relaxed environmental standards as an inducement, the federal laws decree that the state laws and regulations must set standards at least as rigorous as the national standards. The states are usually free to impose stricter standards, if they so desire. States are given more flexibility in adopting administrative procedures for their environmental programs, but even here Congress decrees certain mandatory requirements designed to guarantee the right of public participation in the running of these programs.

As a result of these federal laws, there are three possible schemes for the administrations of environmental regulations:

1. Exclusive Federal Control

   This will occur where the state has no similar law or where the federal government is the only legal authority (i.e., the outer continental shelf or on federal lands). Only a federal permit is required.

2. Exclusive State Control

   This will occur where the state has assumed the administration of a pollution control program required by federal laws or where the state has established rules that have no parallel in federal law. If the state administers a federal permit program, the U.S. EPA will oversee the state's activities, but the operator does not need a separate federal permit.

3. Joint Control

   This will occur when the state has a program of its own, but that program does not meet federal standards. In this case, an operator needs permits from both the state and federal agency.

The scheme that applies to your situation will vary from program-to-program and state-to-state. For example, an EOR operation in Louisiana will need both state and federal permits for water pollution, but only a state permit for solid waste disposal. In Wyoming, on the other hand, the state will issue air and water permits under federally-approved programs, but the federal government will get involved where the operations occur on federal or Indian lands.

1.3.2 Consolidated Permit Regulations

The Consolidated Permit Program was intended to simplify the administration and regulatory burden of five permit programs:

1. National Pollutant Discharge Elimination System (NPDES), which involves permits for discharge of pollutants into surface waters.
2. Underground Injection Control (UIC) Program, which permits injection underground in such a way as to protect drinking water.
3. Hazardous Waste Management (HWM) Program, a part of RCRA, which regulates the disposition of hazardous wastes.
4. Prevention of Significant Deterioration (PSD) Program, a Clean Air Act permit system aimed at regulating emissions into relatively clean air regions.
5. Section 404 "Dredge and Fill" Program, which regulates activities in wetlands and navigable waterways.

2. AIR POLLUTION CONTROL

2.1 Introduction

The federal Clean Air Act establishes standards for state laws and regulations governing air pollution controls. It directs attention to sources known to produce larger volumes of pollutants to the atmosphere than typical enhanced oil recovery (EOR) operations. However, steam generators used for thermal EOR operations are subject to Clean Air Act provisions. Other possible oilfield sources of air pollution which may emit substantial volumes of pollutants, generally in the form of hydrocarbon vapors, include unitized oil storage facilities.

Those states in which large EOR operations are active have achieved primacy under the Clean Air Act. In each of those states air pollution control standards are equal to, or exceed, federal rules and regulations so they may issue permits for the construction and operation of EOR facilities instead of the federal Environmental Protection Agency (EPA).

The Clean Air Act, as amended November 15, 1990, contains provisions for attainment and maintenance of health protective national ambient air quality standards. States have been allowed up to one year to comply with the new EPA amendments to the Clean Air Act. EOR operators generally are not directly affected by the amended federal rules.

More pertinent to EOR operations are state laws and regulations. Typical state laws apply to all sources of air pollution, regardless of size. Most

state regulations require registration of existing sources, pre-construction permits for new sources and operation permits for all sources. However, those Federal regulations which might affect EOR operators are summarized in the following text.

2.2 Current Standards

Although the Clean Air Act does not affect many EOR projects, it may be useful to EOR operators to be aware of national ambient air quality standards. These are summarized in Table 2-1. It is noted that the standards generally are more stringent than they were ten years ago.

For EOR operators who are planning to construct a steam enhanced oil recovery facility, Table 2-2 provides air pollutant emission standards allowed by the federal EPA for new sources. State standards may vary from Federal rules, so readers are advised to contact appropriate state agencies for specific allowances before doing any design work.

2.3 Key Clean Air Act Amendments of November 15, 1990

a. Area Designations

The Governor of each state shall, within one year (after November 15, 1990), submit a list of all areas in the state designated as:

(1) Nonattainment – any area that does not meet the national primary or secondary air quality standard for a pollutant;

(2) Attainment – any area that meets the national primary or secondary ambient air quality standard for a pollutant;

Table 2-1

National Ambient Air Quality Standards

Pollutant	Primary (to be attained by 1992)	Secondary (to be attained in reasonable time)
Sulfur Oxides (measured as SO_2)	80 microgram/m^3 annual (0.03ppm) 365 microgram/m^3 24-hour (0.14ppm) once per year	
Particulate Matter	50 microgram/m^3 annual 150 microgram/m^3 24-hour	Same as primary
Carbon Monoxide	10 milligram/m^3 8-hour (9ppm) once per year 40 milligram/m^3 1-hour (35ppm) once per year	Same as primary
Ozone	235 microgram/m^3 1-hour (0.12ppm)	Same as primary
Nitrogen Dioxide	100 microgram/m^3 annual (.053ppm)	Same as primary
Lead	1.5 microgram/m^3 quarterly	Same as primary

Ref: 40 CFR 50, Sub-chapter C, Parts 50.4-50.12

Table 2-2

Selected New Source Performance Standards

For: Fossil Fuel-Fired Steam Generators, 29-73 MW
Heat Input (100-250 MBtu/hour)

Particulate Matter	0.05 lb/MBtu heat input, liquid or gaseous fuel 20% opacity; 6 minute average
Sulfur Dioxide	0.60 lb/MBtu heat input, liquid fuel
Nitrogen Dioxide	0.10 lb/MBtu heat input, gaseous fuel 0.30 lb/MBtu heat input, liquid fuel

MW: Megawatts
M: Million

Ref: 40 CFR, parts 60.40 thru 60.44b

(3) Unclassifiable – any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary air quality standard for a pollutant.

b. Requirements for Ozone Nonattainment Areas

Classification and Attainment Dates Of Ozone Nonattainment Area

Classification	Ozone Design Value	Attainment Deadline (from enactment)
Marginal	0.121 up to 0.138 ppm	3 years
Moderate	0.138 up to 0.160 ppm	6 years
Serious	0.160 up to 0.180 ppm	9 years
Severe	0.180 up to 0.280 ppm	15 years
Extreme	0.280 ppm and above	20 years

c. Mandatory SIP Provisions for Ozone Nonattainment Areas

(1) Marginal ozone nonattainment areas. State Implementation Plans (SIP) must apply new source requirements (NSR) to major NO_x sources. States must, within two years after enactment, submit an accurate current inventory of actual emissions from all sources.

(2) Within two years after enactment, states must submit revision to require construction and operating permits for each new or modified major stationary source.

(3) Within two years after enactment, states must submit a SIP revision requiring each stationary source of volatile organic compounds (VOC) or NO_x to submit emission statements of actual VOC and NO_x emissions within three years after enactment and annually thereafter.

(4) Moderate ozone nonattainment areas. All requirements applicable to marginal areas apply, plus 15% VOC reductions from baseline within six years after enactment. Note: As ozone severity gets worse, EPA requirements become more stringent, particularly on NSR and motor vehicles.

d. Control Technique Guidelines

(1) Within three years after enactment, the EPA must issue control technique guidelines (CTG's) for eleven additional categories of stationary source VOC emissions, emphasizing categories that make the most significant contribution to ozone attainment.

(2) Within three years after enactment, the EPA must issue a document analyzing alternative control techniques for all stationary source categories of NO_x and VOCs that emit, or have the potential to emit, 25 tons per year (TPY) or more.

e. Requirements for particulate matter, ≤10 micrometers diameter (PM_{10}), Nonattainment Areas

Construction and operating permit programs shall be required for all new and modified stationary PM-10 sources within moderate nonattainment areas.

f. Definition of a Major Source

(1) A major source is defined as any stationary source or group of stationary sources within an area under common control which emits or has the potential to emit ten TPY or more of any hazardous air pollutant, or 25 TPY or more of any combination of hazardous air pollutants.

(2) The EPA may establish a lesser quantity than that specified above, on the basis of the potency, persistence, potential for bioaccumulation, other characteristics of the air pollutant, or other relevant factors.

g. Accident Prevention

(1) Within three years after enactment, EPA must promulgate reasonable regulations and appropriate guidance to provide for the prevention and detection of accidental releases into the ambient air of regulated substances from stationary sources.

(2) The regulations must cover the use, operation, repair, replacement and maintenance of equipment to monitor, detect, inspect and control releases (including personnel training).

(3) The regulation must be applicable three years after promulgation or three years after the date a substance present at the source in more than threshold amounts is listed, whichever is later.

(4) Stationary sources will be required, where a regulated substance is present in quantities greater than the threshold amount, to implement a risk management plan for the detection and prevention of accidental releases.

2.4 The Clean Air Act Amendments of 1990

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

OFFICE OF
AIR AND RADIATION

THE CLEAN AIR ACT AMENDMENTS OF 1990

SUMMARY MATERIALS

U.S. EPA
November 15, 1990

CLEAN AIR ACT AMENDMENTS OF 1990

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The Clean Air Act Amendments of 1990

In June 1989 President Bush proposed sweeping revisions to the Clean Air Act. Building on Congressional proposals advanced during the 1980s, the President proposed legislation designed to curb three major threats to the nation's environment and to the health of millions of Americans: acid rain, urban air pollution, and toxic air emissions. The proposal also called for establishing a national permits program to make the law more workable, and an improved enforcement program to help ensure better compliance with the Act.

By large votes, both the House of Representatives (401-21) and the Senate (89-11) passed Clean Air bills that contained the major components of the President's proposals. Both bills also added provisions requiring the phaseout of ozone-depleting chemicals, roughly according to the schedule outlined in international negotiations (Revised Montreal Protocol). The Senate and House bills also added specific research and development provisions, as well as detailed programs to address accidental releases of toxic air pollutants.

A joint conference committee met from July to October 1990 to iron out differences in the bills and both Houses overwhelmingly voted out the package recommended by the Conferees. The President received the Bill from Congress on November 14, 1990 and signed it on November 15, 1990.

Several progressive and creative new themes are embodied in the Amendments; themes necessary for effectively achieving the air quality goals and regulatory reform expected from these far-reaching amendments. Specifically the new law:

- o encourages the use of market-based principles and other innovative approaches, like performance-based standards and emission banking and trading;
- o provides a framework from which alternative clean fuels will be used by setting standards in the fleet and California pilot program that can be met by the most cost-effective combination of fuels and technology;
- o promotes the use of clean low sulfur coal and natural gas, as well as innovative technologies to clean high sulfur coal through the acid rain program;
- o reduces enough energy waste and creates enough of a market for clean fuels derived from grain and natural gas to cut dependency on oil imports by one million barrels/day;
- o promotes energy concervation through an acid rain program that gives utilitites flexibility to obtain needed emission reductions through programs that encourage customers to conserve energy.

With these themes providing the framework for the Clean Air Act amendments and with our committment to implement the new law quickly, fairly and efficiently, Americans will get what they asked for: a healthy, productive environment, linked to sustainable

economic growth and sound energy policy.

Title I: Provisions for Attainment and Maintenance of National Ambient Air Quality Standards

Although the Clean Air Act Of 1977 brought about significant improvements in our Nation's air quality, the urban air pollution problems of ozone (smog), carbon monoxide (CO) and particulate matter (PM-10) persist. Currently, over 100 million Americans live in cities which are out of attainment with the public health standards for ozone.

The most widespread and persistent urban pollution problem is ozone. The causes of this and the lesser problem of carbon monoxide (CO) and particulate matter (PM-10) pollution in our urban areas are largely due to the diversity and number of urban air pollution sources. One component of urban smog - hydrocarbons - comes from automobile emissions, petroleum refineries, chemical plants, dry cleaners, gasoline stations, house painting and printing shops. Another key component - nitrogen oxides - comes from the combustion of fuel for transportation, utilities and industries.

While there are other reasons for continued high levels of ozone pollution, such as growth in the number of stationary sources of hydrocarbons and continued growth in automobile travel, perhaps the most telling reason is that the remaining sources of hydrocarbons are also the most difficult to control. These are the small sources - generally those that emit less than 100 tons of hydrocarbons per year. These sources, such as auto body shops and dry cleaners, may individually emit less than 10 tons per year, but collectively emit many hundreds of tons of pollution.

The Clean Air Act Amendments of 1990 create a new, balanced strategy for the Nation to attack the problem of urban smog. Overall, the new law reveals the Congress's high expectations of the states and the Federal government. While it gives states more time to meet the air quality standard - up to 20 years for ozone in Los Angeles -, it also requires states to make constant formidable progress in reducing emissions. It requires the Federal government to reduce emissions from cars, trucks, and buses; from consumer products such as hair spray and window washing compounds; and from ships and barges during loading and unloading of petroleum products. The Federal government must also develop the technical guidance that States need to control stationary sources.

The new law addresses the urban air pollution problems of ozone (smog), carbon monoxide (CO), and particulate matter (PM-10). Specifically, it clarifies how areas are designated and redesignated "attainment." It also allows EPA to define the boundaries of "nonattainment" areas: geographical areas whose air quality does not meet Federal air quality standards designed to protect public health.

The new law also establishes provisions defining when and how the federal government can impose sanctions on areas of the country that have not met certain conditions.

For the pollutant ozone, the new law establishes nonattainment area classifications ranked according to the severity of the areas's air pollution problem. These classifications are marginal, moderate, serious, severe and extreme. EPA assigns each nonattainment area one of these categories, thus triggering varying requirements the area must comply with in

order to meet the ozone standard.

As mentioned, nonattainment areas will have to implement different control measures, depending upon their classification. Marginal areas, for example, are the closest to meeting the standard. They will be required to conduct an inventory of their ozone-causing emissions and institute a permit program. Nonattainment areas with more serious air quality problems must implement various control measures. The worse the air quality, the more controls areas will have to implement.

The new law also establishes similar programs for areas that do not meet the federal health standards for the pollutants carbon monoxide and particulate matter. Areas exceeding the standards for these pollutants will be divided into "moderate" and "serious" classifications. Depending upon the degree to which they exceed the carbon monoxide standard, areas will be required to implement programs introducing oxygenated fuels and/or enhanced emission inspection programs, among other measures. Depending upon their classification, areas exceeding the particulate matter standard will have to implement either reasonably available control measures (RACM) or best available control measures (BACM), among other requirements.

Title II: Provisions Relating to Mobile Sources

While motor vehicles built today emit fewer pollutants (60% to 80% less, depending on the pollutant) than those built in the 1960s, cars and trucks still account for almost half the emissions of the ozone precursors VOCs and NOx, and up to 90% of the CO emissions in urban areas. The principal reason for this problem is the rapid growth in the number of vehicles on the roadways and the total miles driven. This growth has offset a large portion of the emission reductions gained from motor vehicle controls.

In view of the unforeseen growth in automobile emissions in urban areas combined with the serious air pollution problems in many urban areas, the Congress has made significant changes to the motor vehicle provisions on the 1977 Clean Air Act.

The Clean Air Act of 1990 establishes tighter pollution standards for emissions from automobiles and trucks. These standards will reduce tailpipe emissions of hydrocarbons, carbon monoxide, and nitrogen oxides on a phased-in basis beginning in model year 1994. Automobile manufacturers will also be required to reduce vehicle emissions resulting from the evaporation of gasoline during refueling.

Fuel quality will also be controlled. Scheduled reductions in gasoline volatility and sulfur content of diesel fuel, for example, will be required. New programs requiring cleaner (so-called "reformulated" gasoline) will be initiated in 1995 for the nine cities with the worst ozone problems. Other cities can "opt in" to the reformulated gasoline program. Higher levels (2.7%) of alcohol-based oxygenated fuels will be produced and sold in 41 areas during the winter months that exceed the federal standard for carbon monoxide.

The new law also establishes a clean fuel car pilot program in California, requiring the phase-in of tighter emission limits for 150,000 vehicles in model year 1996 and 300,000 by the model year 1999. These standards can be met with any combination of vehicle technology and cleaner fuels. The standards become even stricter in 2001. Other states

can "opt in" to this program, though only through incentives, not sales or production mandates.

Further, twenty-six of the dirtiest areas of the country will have to adopt a program limiting emissions from centrally-fueled fleets of 10 or more vehicles beginning as early as 1998.

Title III: Air Toxics

Toxic air pollutants are those pollutants which are hazardous to human health or the environment but are not specifically covered under another portion of the Clean Air Act. These pollutants are typically carcinogens, mutagens, and reproductive toxins. The Clean Air Act Amendments of 1977 failed to result in substantial reductions of the emissions of these very threatening substances. In fact, over the history of the air toxics program only seven pollutants have been regulated.

We know that the toxic air pollution problem is widespread. Information generated from The Superfund "Right to Know" rule (SARA Section 313) indicates that more than 2.7 billion pounds of toxic air pollutants are emitted annually in the United States. EPA studies indicate that exposure to such quantities of air toxics may result in 1000 to 3000 cancer deaths each year.

The Clean Air Act of 1990 offers a comprehensive plan for achieving significant reductions in emissions of hazardous air pollutants from major sources. Industry reports in 1987 suggest that an estimated 2.7 billion pounds of toxic air pollutants were emitted into the atmosphere, contributing to approximately 300-1500 cancer fatalities annually. The new law will improve EPA's ability to address this problem effectively and it will dramatically accelerate progress in controlling major toxic air pollutants.,

The new law includes a list of 189 toxic air pollutants of which emissions must be reduced. EPA must publish a list of source categories that emit certain levels of these pollutants within one year after the new law is passed. The list of source categories must include: 1) major sources emitting 10 tons/year of any one, or 25 tons/year of any combination of those pollutants; and, 2) area sources (smaller sources, such as dry cleaners).

EPA then must issue "Maximum Achievable Control Technology" (MACT) standards for each listed source category according to a prescribed schedule. These standards will be based on the best demonstrated control technology or practices within the regulated industry, and EPA must issue the standards for forty source categories within two years of passage of the new law. The remaining source categories will be controlled according to a schedule that ensures all controls will be achieved within 10 years of enactment. Companies that voluntarily reduce emissions according to certain conditions can get a six year extension from meeting the MACT requirements.

Eight years after MACT is installed on a source, EPA must examine the risk levels remaining at the regulated facilities and determine whether additional controls are necessary to reduce unacceptable residual risk.

The new law also establishes a Chemical Safety Board to investigate accidental releases

of extremely hazardous chemicals. Further, the new law requires EPA to issue regulations controlling air emissions from municipal, hospital and other commercial and industrial incinerators.

Title IV: Acid Deposition Control

As many know, acid rain occurs when sulfur dioxide and nitrogen oxide emissions are transformed in the atmosphere and return to the earth in rain, fog or snow. Approximately 20 million tons of SO2 are emitted annually in the United States, mostly from the burning of fossil fuels by electric utilities. Acid rain damages lakes, harms forests and buildings, contributes to reduced visibility, and is suspected of damaging health.

The new Clean Air Act will result in a permanent 10 million ton reduction in sulfur dioxide (SO2) emissions from 1980 levels. To achieve this, EPA will allocate allowances in two phases permitting utilities to emit one ton of sulfur dioxide. The first phase, effective January 1, 1995, requires 110 powerplants to reduce their emissions to a level equivalent to the product of an emissions rate of 2.5 lbs of SO2/mmBtu x an average of their 1985-1987 fuel use. Plants that use certain control technologies to meet their Phase I reduction requirements may receive a two year extension of compliance until 1997. The new law also allows for a special allocation of 200,000 annual allowances per year each of the 5 years of phase I to powerplants in Illinois, Indiana and Ohio.

The second phase, becoming effective January 1, 2000, will require approximately 2000 utilities to reduce their emissions to a level equivalent to the product of an emissions rate of 1.2 lbs of SO2/mm Btu x the average of their 1985-1987 fuel use. In both phases, affected sources will be required to install systems that continuously monitor emissions in order to track progress and assure compliance.

The new law allows utilities to trade allowances within their systems and/or buy or sell allowances to and from other affected sources. Each source must have sufficient allowances to cover its annual emissions. If not, the source is subject to a $2,000 /ton excess emissions fee and a requirement to offset the excess emissions in the following year.

Nationwide, plants that emit SO2 at a rate below 1.2 lbs/mmBtu will be able to increase emissions by 20% between a baseline year and 2000. Bonus allowances will be distributed to accommodate growth by units in states with a statewide average below 0.8 lbs/mmBtu. Plants experiencing increases in their utilization in the last five years also receive bonus allowances. 50,000 bonus allowances per year are allocated to plants in 10 midwestern states that make reductions in Phase I. Plants that repower with a qualifying clean coal technology may receive a 4 year extension of the compliance date for Phase II emission limitations.

The new law also includes specific requirements for reducing emissions of nitrogen oxides, based on EPA regulations to be issued not later than mid-1992 for certain boilers and 1997 for all remaining boilers.

Title V: Permits

The new law introduces an operating permits program modelled after a similar

program under the Federal National Pollution Elimination Discharge System (NPDES) law. The purpose of the operating permits program is to ensure compliance with all applicable requirements of the Clean Air Act and to enhance EPA's ability to enforce the Act. Air pollution sources subject to the program must obtain an operating permit, states must develop and implement the program, and EPA must issue permit program regulations, review each state's proposed program, and oversee the state's efforts to implement any approved program. EPA must also develop and implement a federal permit program when a state fails to adopt and implement its own program.

This program--in many ways the most important procedural reform contained in the new law--will greatly strengthen enforcement of the Clean Air Act. It will enhance air quality control in a variety of ways. First, adding such a program updates the Clean Air Act, making it more consistent with other environmental statutes. The Clean Water Act, the Resource Conservation and Recovery Act, and the Federal Insecticide, Fungicide, and Rodenticide Act all require permits. The 1977 Clean Air laws also requires a construction permit for certain pollution sources, and about 35 states have their own laws requiring operating permits.

The new program clarifies and makes more enforceable a source's pollution control requirements. Currently, a source's pollution control obligations may be scattered throughout numerous hard-to-find provisions of state and federal regulations, and in many cases, the source is not required under the applicable State Implementation Plan to submit periodic compliance reports to EPA or the states. The permit program will ensure that all of a source's obligations with respect to its pollutants will be contained in one permit document, and that the source will file periodic reports identifying the extent to which it has complied with those obligations. Both of these requirements will greatly enhance the ability of Federal and state agencies to evaluate its air quality situation.

In addition, the new program will provide a ready vehicle for states to assume administration, subject to federal oversight, of significant parts of the air toxics program and the acid rain program. And, through the permit fee provisions, discussed below, the program will greatly augment a state's resources to administer pollution control programs by requiring sources of pollution to pay their fair share of the costs of a state's air pollution program.

Under the new law, EPA must issue program regulations within one year of enactment. Within three years of enactment, each state must submit to EPA a permit program meeting these regulatory requirements. After receiving the state submittal, EPA has one year to accept or reject the program. EPA must levy sanctions against a state that does not submit or enforce a permit program.

Each permit issued to a facility will be for a fixed term of up to five years. The new law establishes a permit fee whereby the state collects a fee from the permitted facility to cover reasonable direct and indirect costs of the permitting program.

All sources subject to the permit program must submit a complete permit application within 12 months of the effective date of the program. The state permitting authority must determine whether or not to approve an application within 18 months of the date it receives the application.

EPA has 45 days to review each permit and to object to permits that violate the Clean

Air Act. If EPA fails to object to a permit that violates the Act or the implementation plan, any person may petition EPA to object within 60 days following EPA's 45-day review period, and EPA must grant or deny the permit within 60 days. Judicial review of EPA's decision on a citizen's petition can occur in the Federal court of appeals.

Title VI: Stratospheric Ozone and Global Climate Protection

The new law builds on the market-based structure and requirements currently contained in EPA's regulations to phase out the production of substances that deplete the ozone layer. The law requires a complete phase-out of CFCs and halons with interim reductions and some related changes to the existing Montreal Protocol, revised in June 1990.

Under these provisions, EPA must list all regulated substances along with their ozone-depletion potential, atmospheric lifetimes and global warming potentials within 60 days of enactment.

In addition, EPA must ensure that Class I chemicals be phased out on a schedule similar to that specified in the Montreal Protocol -- CFC's, halons, and carbon tetrachloride by 2000; methyl chloroform by 2002 -- but with more stringent interim reductions. Class II chemicals (HCFC's) will be phased out by 2030. Regulations for class I chemicals will be required within 10 months, and Class II chemical regulations will be required by December 31, 1999.

The law also requires EPA to publish a list of safe and unsafe substitutes for Class I and II chemicals and to ban the use of unsafe substitutes.

The law requires nonessential products releasing Class I chemicals to be banned within 2 years of enactment. In 1994 a ban will go into effect for aerosols and non-insulating foamsusing Class II chemicals, with exemptions for flammability and safety. Regulations for this purpose will be required within one year of enactment, to become effective two years afterwards.

Title VII: Provisions Relating to Enforcement

The Clean Air Act of 1990 contains a broad array of authorities to make the law more readily enforceable, thus bringing it up to date with the other major environmental statutes.

EPA has new authorities to issue administrative penalty orders up to $200,000, and field citations up to $5000 for lesser infractions. Civil judicial penalties are enhanced. Criminal penalties for knowing violations are upgraded from misdemeanors to felonies, and new criminal authorities for knowing and negligent endangerment will be established.

In addition, sources must certify their compliance, and EPA has authority to issue administrative subpoenas for compliance data. EPA will also be authorized to issue compliance orders with compliance schedules of up to one year.

The citizen suit provisions have also been revised to allow citizens to seek penalties against violators, with the penalties going to a U.S. Treasury fund for use by EPA for compliance and enforcement activities. The government's right to intervene is clarified and citizen plaintiffs will be required to provide the U.S. with copies of pleadings and draft settlements.

Other Titles

The Clean Air Act Amendments of 1990 continue the federal acid rain research program and contain several new provisions relating to research, development and air monitoring. They also contain provisions to provide additional unemployment benefits through the Job Training Partnership Act to workers laid off as a consequence of compliance with the Clean Air Act. The Act also contains provisions to improve visibility near National Parks and other parts of the country.

CLEAN AIR ACT AMENDMENTS OF 1990

SUMMARY OF KEY TITLES

U.S. EPA
November 15, 1990

Title I - Nonattainment

- Divides cities into six categories for ozone (3 yrs. - marginal, 6 yrs. moderate, 9 yrs serious, 15 - 17 yrs severe, 20 yrs extreme) and 2 categories for Carbon monoxide.

- % Reduction: Applies to ozone only. Moderate areas and above must achieve 15% VOC reduction within 6 years of enactment. For serious and above, average of 3% VOC per year thereafter until attainment. Annual VOC and NOx reductions as needed to attain. The 15% and 3% is from an adjusted baseline and all reductions except those from existing FMVCP, gasoline volatility, RACT and I/M fixups are creditable. Possible exemption from % reduction based on technological feasibility, if SIP adopts measures similar to those in next higher category and if all feasible measures are adopted in the first 6 years. NOx substitution possible after 6 years.

- Prescribed Measures: Major NOx sources meet same requirements as major VOC sources unless EPA finds no benefit. All ozone nonattainment areas correct existing RACT rules and I/M programs. Moderate areas add basic I/M, Stage II and RACT on new and existing CTG and 100 ton non-CTG sources, and make an attainment demonstration. Serious areas add enhanced I/M, RACT on 50 ton non-CTG sources, a fleet vehicle program in areas of 250,000 and up, TCMs needed to offset vehicle growth, special rules for source modifications, and photochemical modeling attainment demonstration. Severe areas add RACT for 25 ton VOC non-CTG sources and provisions requiring adoption of TCMs, if necessary to meet progress requirements and employer trip reduction provisions. Extreme areas add RACT on 10 ton sources, eliminate feasibility exemption from 15% and 3%, add NOx reductions from clean fuels or advanced technology, have peak hour traffic controls; can get SIP approved based on anticipated new technology.

- Federal Measures: EPA issues 11 new CTGs plus CTGs for aerospace coatings, shipbuilding and repair; marine vessels rule and consumer products rules. Requires an ACT for 25 ton NOx and VOC sources.

- Sanctions: Grace period of 18 months to cure planning failure. Then must apply 1 of 2 sanctions (modified highway ban or 2:1 offset). Air grants are available. There are Existing construction bans remain, but no new ones.

- Federal Implementation Plans (FIPs): Within 2 years of state failure to develop an adequate SIP, mandatory attainment FIPs required.

- Transport: Sets up 11-state NE transport commission. Requires transport states to adopt RACT for existing and new CTGs, RACT on major (50-ton) non-CTG sources, enhanced I/M in MSAs above 100,000 and Stage II or equivalent. No opt-out of VOC measures. Major NOx sources meet same requirements as major VOC sources unless EPA finds no benefit.

- CO and PM-10: Wintertime oxygenated fuels in all CO areas >9.4 ppm. Areas >12.7 ppm add VMT forecast, enhanced I/M and demonstrate attainment. Serious CO areas add TCMs as in severe ozone areas. PM-10 areas initially designated nonattainment must attain by 12/94 (possible extension to 2001). Moderate areas adopt RACM; serious areas add BACM. Serious CO and PM-10 areas adopt measures to achieve 5% reduction per year effective upon failure to attain.

Title II - Mobile Sources

- Tailpipe Standards: Cars and light trucks: Tier I is 0.25 NMHC, 3.4 CO and 0.4 NOx. Possible Tier II is 0.125 NMHC, 1.7 CO and 0.2 NOx. Tier I phased in 1994-1996. Effectiveness of Tier II in 2004 depends on EPA study of need, feasibility, and cost-effectiveness. Useful life extended to 100,000 miles for most emission standards.

- Cold Temperature CO: Phase-in beginning in 1994 of 10 gpm at 20 degrees F for cars. A 3.4 gpm standard takes effect in 2002 if 6 or more cities are in CO nonattainment in mid-1997.

- Clean Fuels: In 1998 all centrally-fueled fleets in 26 areas must buy 30% of the new vehicles that meet standards of 0.075 gpm VOC and 0.2 NOx; no toxic standards. If such vehicles are not being offered for sale in California the program is delayed possibly until 2001. Purchase requirements increase to 70% in 3rd year.

  In 1996, 150,000 clean fuel cars are required to be sold in California; increasing to 300,000 per year by 1999. These cars must meet a standard of 0.125 gpm VOC. Phase 2 begins in 2001 with cars meeting fleet-type standards. Other cities can opt-in to program.

- Reformulated Gasoline: Beginning in 1995 reformulated gasoline is required in the 9 worst ozone areas; minimum oxygen content (2.0%), benzene (1.0%), aromatics (25%), VOCs and toxics reductions (15%, up to 20-25% in 2000). Cities can opt-in.

- Oxyfuels: Beginning in 1992, gas in 41 CO areas must have 2.7% oxygen level in winter months.

- Urban Buses: Delays diesel particulate standard from 1991 to 1993. Beginning in 1994 all buses must meet a PM standard of 0.05 g/hphr (if not feasible EPA will set at 0.07). Based on performance EPA may implement a low polluting bus program in larger cities.

- Refueling: After consultation with DOT on safety issues, EPA required to promulgate onboard controls. Stage II requirements vary by classification.

- Volatility: 9 psi in most of the country beginning 1992; EPA can set lower levels in warmer areas, but cannot require any standard below 9 psi in attainment areas.

- Desulfurization: Diesel fuel highway use limited to 0.05% sulfur by weight.

- Air Toxics: Based on a study of mobile source-related toxics, EPA will regulate, at a minimum, emissions of benzene and formaldehyde.

- Non-road Engines: Based on a study, EPA may regulate any category of non-road engines that contribute to urban air pollution. At a minimum, EPA must control locomotive emissions.

- Lead in Gasoline: As of January 1, 1996, lead banned from use in motor vehicle fuel.

Title III - Air Toxics

- List of Pollutants and Source Categories: Law lists 189 hazardous air pollutants. One year after enactment EPA lists source categories (industries) which emit one or more of the 189 pollutants. In 2 years, EPA must publish a schedule for regulation of the listed source categories.

- Maximum Achievable Control Technology (MACT): MACT regulations are emission standards based on the best demonstrated control technology and practices in the regulated industry. MACT for existing sources must be as stringent as the average control efficiency or the best controlled 12% of similar sources excluding sources which have achieved the LAER within 18 months prior to proposal or 30 months prior to promulgation. MACT for new sources must be as stringent as the best controlled similar source. For all listed major point sources, EPA must promulgate MACT standards - 40 source categories plus coke ovens within 2 years and 25% of the remainder of the list within 4 years. An additional 25% in 7 years and the final 50% in 10 years.

- Residual Risk: Eight years after MACT standards are established (except for those established 2 years after enactment), standards to protect against the residual health and environmental risks remaining must be promulgated, if necessary. The standards would be triggered if more than one source in a category exceeds a maximum individual risk of cancer of 1 in 1 million. These residual risk regulations would be based on current CAA language that specifies that standards must achieve an "ample margin of safety".

- Accidental Releases: Standards to prevent against accidental release of toxic chemicals are required. EPA must establish a list of at least 100 chemicals and threshold quantities. All facilities with these chemicals on site in excess of the threshold quantities would be subject to the regulations which would include hazard assessments and risk management plans. An independent chemical safety board is established to investigate major accidents, conduct research, and promulgate regulations for accidental release reporting.

- Other Issues: A study of area source emissions and a strategy to reduce the cancer incidence from these emissions by 75% is required. Regulation of source categories accounting for 90% of the emissions of the 30 most hazardous area source pollutants. Coke ovens can receive an extension of the residual risk standards until 2020 in exchange for compliance with stringent emission standards. Air toxics regulations of utilities will be based on the results of toxic emissions studies. A study of deposition to the Great Lakes, Lake Champlain, Chesapeake Bay and coastal waters will determine whether additional regulation is needed. Regulations are required for all types of municipal waste combustors and an exclusion for facilities which burn 30% or less municipal waste.

Title IV - Acid Rain

- SO2 Reduction: A 10 million ton reduction from 1980 levels, primarily from utility sources. Caps annual utility S02 emissions at approximately 8.9 million tons by 2000.

- Allowances: S02 reductions are met through an innovative market-based system. Affected sources are allocated allowances based on required emission reductions and past energy use. An allowance is worth one ton of S02 and it is fully marketable. Sources must hold allowances equal to their level of emissions or face a $2000/excess ton penalty and a requirement to offset excess tons in future years. EPA will also hold special sales and auctions of allowances.

- Phase I: S02 emission reductions are achieved in two phases. Phase I allowances are allocated to large units of 100 MW or greater that emit more than 2.5 lb/mmbtu in an amount equal to 2.5 lb/mmBtu x their 1985-87 energy usage (baseline). Phase I must be met by 1995 but units that install certain control technologies may postpone compliance until 1997, and may be eligible for bonus allowances. Units in Illinois, Indiana or Ohio are allotted a pro rata share of an additional 200,000 allowances annually during Phase I.

- Phase II: Phase II begins in 2000. All utility units greater than 25 MW that emit at a rate above 1.2 lbs/MMBtu will be allocated allowances at that rate x their baseline fuel consumption. Cleaner plants generally will be provided with 20% more allowances than would have been received based on their baseline consumption. 50,000 bonus allowances are allocated to plants in 10 midwestern states that make reductions in Phase I.

- NOX: Utility NOx reductions will help to achieve a 2 million ton reduction from 1980 levels. Reductions will be accomplished through required EPA performance standards for certain existing boilers in Phase I, and others in Phase II. EPA will develop a revised NOx NSPS for utility boilers.

- Repowering: Units repowering with qualifying Clean Coal Technologies receive a 4 year extension for Phase II compliance. Such units may be exempt from New Source Review requirements and New Source Performance Standards.

- Energy Conservation & Renewable Energy: These projects may be allocated a portion of up to 300,000 incentive allowances.

- Clean Coal Technologies (CCT): Certain CCT demonstration projects may be exempt from NSPS, NSR, and Title I nonattainment requirements.

- Monitoring: Requires continuous emission monitors or an equivalent for S02 and NOX and also requires opacity and flow monitors.

Title V - Operating Permits

- Within 3 years of enactment, States must develop operating permit programs. EPA reviews for approval based on regulatory guidelines EPA issues within one year of enactment.

- Permits will apply to major sources covered under Title I, as well as sources covered by other titles of the Act.

- All sources subject to the program must submit permit applications to the state within 1 year of the effective date (i.e., date of EPA approval) of the state program. The state must establish a schedule for acting on initial permit applications which assures that at least a third of these submitted applications will be acted upon annually for 3 years.

- The state must issue permits for a term of up to five years. Permits must include all Clean Air Act requirements applicable to the source. They must also include a schedule of compliance and applicable monitoring and reporting requirements.

- Sources must pay permit fees to cover the costs of the permitting program.

- EPA must veto a permit if it does not comply with any applicable Clean Air Act requirements.

- The public may sue to compel EPA to perform nondiscretionary duty if EPA fails to veto a permit that does not comply with the Act. Such cases are reviewable in the Federal Court of Appeals.

- Once issued, the permit replaces the otherwise applicable requirements specifically identified in the permit, but EPA may require that the permit be reopened for cause. A permit with a term of 3 or more years must be reopened if new requirements applicable to the source are promulgated.

- EPA may impose sanctions if a state fails to resubmit an approvable permit program after EPA has determined the initial submittal is deficient.

Title VI - Stratospheric Ozone & Global Climate Protection

- Listing: EPA must list specified ozone depleting substances with their ozone-depletion potential, chlorine/bromine loadings, atmospheric lifetimes and global warming potentials within 60 days after enactment. EPA to add to list at least every 3 years substances meeting specified criteria.

- Phase-out: Phase-out dates are similar to Montreal Protocol for Class I (2000 for CFC, halon and carbon tetrachloride; 2002 for methyl chloroform), but with more stringent interim reductions. Class II (HCFC) substances phased out by 2030. Regulations for Class I required within 10 months, Class II by 12/31/99.

- Exchange: Requires a net environmental benefit from trades of allowances to produce controlled substances. Regulations required within 10 months after enactment.

- Recycling/Use Limits: Restricts use and emissions to LAER, requires maximum recycling and safe disposal for CFC refrigerants within 2 years, all other class I and II substances within 4 years. Illegal to vent class I or II refrigerants after 7/1/92. Prohibition on venting any environmentally harmful substitute refrigerant after 5 years.

- Mobile Air Conditioners: Mandatory recycling after 1/1/92. Certification of equipment and personnel. Ban on small containers (except certified personnel).

- Nonessential Products. Bans nonessential products that result in releases of class I substances within 2 years. Beginning 1994, ban use of class II substances in aerosols and non-insulating foams, with exemptions for flammability and safety. Regulation 1 year after enactment, effective after 2 years.

- Labeling. Mandatory warning labels on all containers of products made with and containing class I or class II substances (depending, in some cases, on availability of safe alternatives). Regulations required within 18 months after enactment, effective 30 months after. In case of labeling, requirements applicable to containers of Class I and II substances and to products containing Class I substances. All products must be labeled by 2015.

- Safe Alternatives. Requires prior notice of sale of new and existing chemicals for significant new use as substitute. EPA to publish list of safe and unsafe uses of substitutes for Class I and II as identified. Gives authority to restrict the use of unsafe substitutes. Rules required within 2 years after enactment.

- Procurement. Requires all Federal Agencies to amend their procurement regulations to maximize the use of safe alternatives for Class I and II substances. Regulations required within 18 months after enactment, effective 30 months after.

- Methane. EPA to publish 5 reports to Congress within 2 years, and 1 follow-up report within 4 years.

Title VII - Enforcement

- Enhances Enforceability: Makes the CAA more easily enforceable and consistent with recent environmental statutes, like the Clean Water Act and the Resource Conservation and Recovery Act. A broad array of new enforcement authorities, from "traffic tickets" to criminal felonies, are provided to better match the penalty to the severity of the violation. However, some changes also limit enforcement in new ways.

- Violations: Criminal violations are upgraded from misdemeanors to felonies, consistent with other environmental statutes.

- New Criminal Sanctions: Will be added for knowing endangerment and negligent endangerment in connection with air toxics.

- Penalties: EPA may issue administrative penalty orders up to $200,000 and field citations for minor violations up to $5,000, rather than taking every violation to court. EPA may issue administrative subpoenas. Sources may challenge assessments in administrative hearings and District Court.

- Scope: Duration and scope of emergency orders are expanded. Authority to issue administrative compliance orders to sources is expanded to authorize schedules of up to 1 year.

- Restrictions: Definitions of the terms "operator" and "person", which immunize many potential violators from enforcement, are restricted.

- Citizen suit: Provisions are revised to allow courts to assess penalties as well as enjoin violations. The money will go to a special U.S. Treasury fund. Money may be designated for air compliance activities, or mitigation projects. District Courts are given jurisdiction over suits against EPA for unreasonable delay.

- Oversight: Effective federal oversight of citizen suits is provided through additional notification requirements.

- Punishment: The ability to prove and adequately punish ongoing and recurring violations is strengthened because the burden of proof is on the defendant for the purpose of determining penalty liability once the government shows that a violation has occurred. Once a violation has been proven, any credible evidence is admissible to show that the violation continued.

- Contractors: Listing authority (by which violators are barred from receiving government contracts, grants and loans) is revised so that all criminal convictions result in debarment. EPA is not explicitly allowed to use contractors for inspection purposes.

Title VIII - Miscellaneous Provisions

- Outer Continental Shelf (OCS): Program to control air pollution from sources on the Outer Continental Shelf. Sources within 25 miles of shore required to meet the same standards as onshore areas. Exemptions possible if the Administrator finds that compliance is technologically infeasible or will cause an unreasonable threat to health and safety. States adjacent to OCS sources may implement and enforce requirements if approved by the Administrator. Within 3 years of enactment the Secretary of the Interior will conduct a study of areas adjacent to Texas, Louisiana, Mississippi and Alabama, examining the impacts of emissions from Outer Continental Shelf activities.

- Establishment of program to monitor and improve air quality in regions along the border between the United States and Mexico: Program effective through July 1, 1995. Monitoring conducted to determine the sources of pollutants for which NAAQS have been established. The information will be used to aid in the process of attainment for sources out of compliances with the NAAQS. The Administrator can negotiate with Mexican representatives to reduce the level of airborne pollutants and achieve NAAQS in regions along the U.S./Mexico border. Each year the Administrator will give an annual report to Congress concerning the status of the program and the progress of reaching attainment in border regions.

- Visibility: Each year, for 5 years, $ 8 million will be allocated to conduct studies which will identify and evaluate sources and source regions of both visibility impairment and Class I regions. Research includes expansion of monitoring in Class I areas, assessment of sources affecting visibility, adaptation of regional air quality models and studies of atmospheric chemistry and physics pertaining to visibility. 24 months after enactment, Administrator will conduct an assessment of how the Clean Air Act Amendments are affecting Class I areas. The Administrator can establish Visibility Transport Regions if two or more affected states petition the Administrator that the interstate transport of air pollutants is negatively affecting visibility in Class I areas. In conjunction with the transport region, a commission shall be designated. The Commission will evaluate data, studies and information pertaining to adverse impacts on visibility. Based on the evaluation, action may be taken to remedy any negative impacts. The Administrator shall establish a Grand Canyon Visibility Transport Commission within 12 months of enactment.

- International Border Areas: Provides that an implementation plan or revision shall be approved by the Administrator if it meets all of the Act's requirements except attainment of NAAQS because of emissions emanating from outside the United States. States that can prove that they cannot meet ozone, CO or PM-10 attainment levels by the applicable deadline because of emissions from outside of the U.S. shall not be penalized.

- Other Key Provisions: - Grants For Support of Air Pollution Planning and Control Programs, Section 808 - Renewable energy and energy Conservation incentives and Section 817 - The Role of Secondary Standards.

Title IX - Clean Air Research

- Monitoring and modeling: Research calls for improved methods and techniques for measuring individual air pollutants and complex mixtures, and for addressing urban and regional ozone. Maintenance of a national monitoring network to assess the status and trends of air emissions, deposition, air quality, surface water quality, forest conditions and visibility is required.

- Health effects: EPA will study the short and long-term health effects associated with exposure to air pollutants and develop methods to assess risks from these pollutants. An interagency task force, led by EPA, will coordinate the research. EPA is required to prepare environmental health assessments for all listed hazardous air pollutants.

- Ecosystem: Studies for improving our understanding of ecosystem effects from individual and multiple air pollutants, including the effects of air pollution on water quality, forests, biological diversity, and other terrestrial and aquatic systems exposed to air pollutants.

- Accidental Releases: Research calls for improvements in predictive models and response technology for accidental releases of dense gases. EPA will oversee the research using the Department of Energy's Liquefied Gaseous Fuels Spill Test Facility for the experimental work.

- Pollution Prevention and Emissions Control: Research is required to develop technologies and strategies for air pollution prevention from stationary and area sources.

- Acid Precipitation Research Program: Continuation of research by an intra-agency task force. It will review the status of research activities conducted to date and submit to Congress a revised plan that identifies key research gaps and establishes a program to address current and future research priorities. EPA is required to sponsor specialized acid deposition studies and to have the results of its research efforts included in Task Force reports.

- Clean alternative fuels: Research directs EPA to identify, characterize and predict air emissions and other potential environmental effects associated with alternative fuels. EPA is required to determine the risks and benefits to human health and the environment relative to those from gasoline.

- Other Studies: Coordinate research with appropriate Federal agencies. Study of control technologies used in other industrialized countries. A six million dollar research effort on the effects of acid deposition on waters in the Adirondack region.

Title XI - Clean Air Employment Transition Assistance

- o Job Partnership Training Act (JTPA): Amends Title III of the Job Partnership Training Act. An additional $50 million per year for 1991-1995 allocated to JTPA Title III to assist dislocated workers, the majority of who will likely be high sulfur coal miners, dislocated because of implementation of the acid rain title.

- o Funding: Ninety-five percent of the funding will go to the worker assistance programs and the remaining five percent will be used to administer the title. The Department of Labor will administer the program. Regulations must be developed within 180 days of the bill's passage.

- o Benefits: In addition to the benefits currently available to dislocated workers through JTPA Title III, people will be able to receive job search allowances, relocation assistance, needs related payments and extended monetary assistance. Extended monetary assistance will be available to dislocated workers who have exhausted their unemployment insurance benefits as long as their are in qualified training or educational programs.

- o Difference from Current Program: Currently, JTPA Title III can provide the benefits mentioned above. But, because of constraints in the way the program is operated, these benefits are not provided frequently. Title XI ensures that dislocated workers, if eligible, receive benefits.

    - The intent for providing further monetary assistance, in the form of needs related payments, is so that workers, who are adjusting to a career change and are enrolled in training or educational programs that exceed the period of time for which they receive Unemployment Insurance (UI), are able to complete training or education with further monetary assistance.

- o Eligibility: Payments will be awarded to a dislocated worker, if he is enrolled in training or an educational program, and either he or a member of his family has an income level below the state poverty income level. Payments will be equivalent to either the amount a person was receiving from their UI, or enough so as to bring the person up to the poverty level.

CLEAN AIR ACT AMENDMENTS OF 1990

GLOSSARY OF TERMS

U.S. EPA
November 15, 1990

Acid Deposition ("Acid Rain"). -- A complex chemical and atmospheric phenomenon that occurs when emissions of sulfur and nitrogen compounds and other substances are transformed by chemical processes in the atmosphere, often far from the original sources, and then deposited on earth in either a wet or dry form. The wet forms, popularly called "acid rain," can fall as rain, snow, or fog. The dry forms are acidic gases or particulates.

Air Toxics. -- Any air pollutant for which a national ambient air quality standard (NAAQS) does not exist (i.e. excluding ozone, carbon monoxide, PM-10, sulfur dioxide, nitrogen dioxide) that may reasonably be anticipated to cause cancer, developmental effects, reproductive dysfunctions, neurological disorders, heritable gene mutations or other serious or irreversible chronic or acute health effects in humans.

Aromatics. -- A type of hydrocarbon, such as benzene or toluene, added to gasoline in order to increase octane. Some aromatics are toxic.

Attainment Area. -- An area considered to have air quality as good as or better than the National Ambient Air Quality Standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a non-attainment area for others.

Best Available Control Measure (BACM). -- A term used in the House bill referring to the "best" measures (according to EPA guidance) for controlling small or dispersed sources of particulate matter, such as roadway dust, woodstoves, and open burning.

Carbon Monoxide (CO). -- A colorless, odorless gas which is toxic because of its tendency to reduce the oxygen-carrying capacity of the blood.

Clean Coal Technology. -- Any technology not in widespread use as of the date of enactment of the Clean Air Act amendments which will achieve significant reductions in pollutants associated with the burning of coal.

Clean Fuels. -- Blends and/or substitutes for gasoline fuels. These include compressed natural gas, methanol, ethanol, and others.

Coke Oven. -- An industrial process which converts coal into coke, which is one of the basic materials used in blast furnaces for the conversion of iron ore into iron.

Cold Temperature CO. -- A standard for automobile emissions of carbon monoxide (CO) to be met at a low temperature (i.e., 20 degrees F.). Conventional catalytic converters are less efficient upon start-up at low temperatures.

Control Techniques Guideline (CTG). -- Guidance documents issued by EPA which define reasonably available control technology (RACT) to be applied to existing facilities that emit certain threshold quantities of air pollutants; they contain information both on the economic and technological feasibility of available techniques.

CFCs (Chlorofluorocarbons). -- A family of inert, nontoxic, and easily-liquefied chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents or aerosol propellants. Because CFCs are not destroyed in the lower atmosphere they drift into the upper atmosphere where the chlorine is released and destroys ozone.

CFC-12. -- A chlorofluorocarbon with a trademark name of Freon, commonly used in refrigeration and automobile air conditioning.

Emission Control Diagnostics. -- Computerized devices placed on vehicles to detect malfunction of emissions controls and notify the owner of the need for repair.

Enhanced Inspection & Maintenance (Enhanced I&M). -- An improved automobile inspection and maintenance program that includes, as a minimum, increases in coverage of vehicle types and model years, tighter stringency of inspections and improved management practices to ensure more effectiveness. This may also include annual, computerized, or centralized inspections; under-the-hood inspections to detect tampering with pollution control equipment; and increased repair waiver cost. The purpose of Enhanced I&M is to reduce automobile emissions by assuring that cars are running properly.

Federal Implementation Plan (FIP). -- Under current law, a federally implemented plan to achieve attainment of an air quality standard, used when a State is unable to develop an adequate plan. Under the Senate bill, a plan containing control measures developed and promulgated by EPA in order to fill gaps in a State Implementation Plan (SIP).

Gasoline Volatility. -- The property of gasoline whereby it evaporates into a vapor. Gasoline volatility is measured in pounds per square inch (psi), with a higher number reflecting more gasoline evaporation. Gasoline vapor is a volatile organic compound (VOC).

Halons. -- A family of compounds containing bromine used in fighting fires, whose breakdown in the atmosphere depletes stratospheric ozone.

HCFCs. -- Chlorofluorocarbons that have been chemically altered by the addition of hydrogen, and which are significantly less damaging to stratospheric ozone than other CFCs.

Inspection & Maintenance (I&M). -- A program providing for periodic inspections-of motor vehicles to ensure that emissions of specified pollutants are not exceeding established limitations.

Low NOx Burners. -- One of several combustion technologies used to reduce emissions of NOx.

Maximum Achievable Control Technology (MACT). -- Emissions limitations based on the best demonstrated control technology or practices in similar sources to be applied to major sources emitting one or more of the listed toxic pollutants.

Montreal Protocol. -- An international environmental agreement to control chemicals that deplete the ozone layer. The protocol, which was renegotiated in June 1990, calls for a phase-out of CFCs, halons, and carbon tetrachloride by the year 2000, a phase-out of chloroform by 2005, and provides financial assistance to help developing countries make the transition from ozone-depleting substances.

NOx (Nitrogen Oxides). -- Chemical compounds containing nitrogen and oxygen; reacts with volatile organic compounds, in the presence of heat and sunlight to form ozone. It is also a major precursor to acid rain. Nationwide, approximately 45 percent of NOx emissions come from mobile sources, 35 percent from electric utilities, and 15 percent from industrial fuel combustion.

Onboard Controls. -- Devices placed on vehicles to capture gasoline vapor during refueling and then route the vapors to the engine when the vehicle is started so that they can be efficiently burned.

Oxygenated Fuels. -- Gasoline which has been blended with alcohols or ethers that contain oxygen in order to reduce carbon monoxide and other emissions.

Ozone. -- A compound consisting of three oxygen atoms, that is the primary constituent of smog. It is formed through chemical reactions in the atmosphere involving volatile organic compounds, nitrogen oxides, and sunlight. Ozone can initiate damage to the lungs as well as damage tc trees, crops, and materials. There is a natural layer of ozone in the upper atmosphere which shields the earth from harmful ultraviolet radiation.

PM-10. -- A new standard for measuring the amount of solid or liquid matter suspended in the atmosphere ("particulate matter"). Refers to the amount of particulate matter over 10 micrometers in diameter. The smaller PM-10 particles penetrate to the deeper portions of the lung, affecting sensitive population groups such as children and people with respiratory diseases.

Reasonably Available Control Measures (RACM). -- A broadly defined term referring to technologies and other measures that can be used to control pollution; includes Reasonably Available Control Technology and other measures. In the case of PM-10, it refers to approaches for controlling small or dispersed source categories such as road dust, woodstoves, and open burning.

Reasonably Available Control Technology (RACT). -- An emission limitation on existing sources in non-attainment areas, defined by EPA in a Control Techniques Guideline (CTG) and adopted and implemented by States.

Reformulated Gasoline. -- Gasoline with a different composition from conventional gasoline (e.g., lower aromatics content) and that results in the production of lower levels of air pollutants.

Repowering. -- The replacement of an existing coal-fired boiler with one or more clean coal technologies, in order to achieve significantly greater emission reduction relative to the performance of technology in widespread use as of the enactment of the Clean Air Act amendments.

Residual Risk. -- The quantity of health risk remaining after application of the MACT (Maximum Achievable Control Technology).

Sanctions. -- Actions taken against a State or local government by the Federal government for failure to plan or to implement a SIP. Examples include withholding of highway funds and a ban on construction of new sources.

Stage II Controls. -- Systems placed on service station gasoline pumps to control and capture gasoline vapors during automobile refueling.

State Implementation Plan (SIP). -- Documents prepared by states, and submitted to EPA for approval, which identifies actions and programs to be undertaken by the State and its subdivisions to implement their responsibilities under the Clean Air Act.

Sulfur Dioxide (SO2). -- A heavy, pungent, colorless air pollutant formed primarily by the combustion of fossil fuels. It is a respiratory irritant, especially for asthmatics and is the major precursor to the formation of acid rain

Transportation Control Measures (TCMs). -- Steps taken by a locality to adjust traffic patterns (e.g., bus lanes, right turn on red) or reduce vehicle use (ridesharing, high-occupancy vehicle lanes) to reduce vehicular emissions of air pollutants.

Vehicle Miles Travelled (VMT). -- A measure of both the volume and extent of motor vehicle operation; the total number of vehicle miles travelled within a specified geographical area (whether the entire country or a smaller area) over a given period of time.

Volatile Organic Compounds (VOCs). -- A group of chemicals that react in the atmosphere with nitrogen oxides in the presence of heat and sunlight to form ozone; does not include methane and other compounds determined by EPA to have negligible photochemical reactivity. Examples of VOCs include gasoline fumes and oil-based paints.

CLEAN AIR ACT AMENDMENTS OF 1990

LEGISLATIVE CHRONOLOGY

U.S. EPA
November 15, 1990

LEGISLATIVE CHRONOLOGY OF EVENTS – CLEAN AIR ACT AMENDMENTS

- **JUNE 12, 1989** – President Bush announces the Administration's clean air proposal which comprehensively addresses three areas of environmental concern: acid deposition, toxic air pollution, and urban air quality

- **JULY 21, 1989** – the legislative language interpreting the President's proposal is submitted to Congress

- **JULY 27, 1989** – the Administration's bill is introduced by House Energy and Commerce Committee Chairman John Dingell (D-MI) as H.R. 3030 with 146 cosponsors (eventually 166); the measure is subsequently referred to the Energy and Commerce Committee

- **AUGUST 3, 1989** – the Administration's bill is introduced in the Senate by Senator John Chafee (R-RI) as S. 1490 with 24 cosponsors (eventually 25); the measure is subsequently referred to the Senate Environment and Public Works Committee

- **SEPTEMBER 13, 1989** – Health and Environment Subcommittee of the House Energy and Commerce Committee holds first of 11 mark-ups on H.R. 3030 that continue through October 11, 1989

- **OCTOBER 11, 1989** – Health and Environment Subcommittee of House Energy and Commerce held their final mark-up of the Administration's bill (H.R. 3030); the measure, as amended, is sent to full Committee by a 21 - 0 vote

- **OCTOBER 26, 1989** – Environmental Protection Subcommittee of Senate Environment and Public Works begins process of marking-up clean air legislation

- **NOVEMBER 14, 1989** – Environmental Protection Subcommittee of Senate Environment and Public Works votes to include an Acid Rain title which is based on the Administration's original proposal; the Subcommittee had no further action on S. 1630

- **NOVEMBER 16, 1989** – Senate Environment and Public Works votes out a Clean Air bill (S. 1630) by a 15 - 1 margin

- **JANUARY 23, 1990** – Floor debate begins in the U.S. Senate

- **FEBRUARY 1, 1990** – a group of bipartisan Senators begin meeting with Administration officials in a month-long, closed door negotiation session on amendments to S. 1630; during which, Senate floor debate is put on hold

- **MARCH 5, 1990** – Senator George Mitchell announces agreement with the Administration on several key aspects of clean air; this measure is the product of the Administration and bipartisan Senate negotiations during February and served as the vehicle for Senate floor deliberation (it would eventually become S. 1630)

- **MARCH 14, 1990** – Energy and Power Subcommittee of House Energy and Commerce reports H.R. 3030 out to full committee; the Subcommittee had jurisdiction over the alternative fuels and acid rain provisions in the bill, but the Chairman decided not to mark-up / amend ther measure

- **MARCH 14, 1990 – House Committee on Energy and Commerce begins public mark-up of H.R. 3030**

- **APRIL 3, 1990 – the Senate votes out the Clean Air Act Amendments of 1990; the measure was passed by a vote of 89 - 11. The following Senators voted against final passage of the bill: Byrd, Rockefeller, Simon, Dixon, McClure, Symms, Garn, Glenn, Helms, Nickles, and Wallop.**

- **MAY 17, 1990 – House Committee on Energy and Commerce reports H.R. 3030 out of committee by a vote of 42 - 1; the measure then moved to the entire House of Representatives**

- **MAY 17, 1990 – House Committee on Public Works and Transportaton and the House Committee on Ways and Means were given sequential referral of certain aspects of H.R. 3030; both committees report the bill out on May 21, 1990**

- **MAY 17, 1990 – House Committee on Ways and Means receives sequential referral of H.R. 3030 for a period ending no later than May 21, 1990**

- **MAY 23, 1990 – the House of Representatives votes to pass a new Clean Air Act by a vote of 401 - 21**

- **JUNE 6, 1990 – the Senate announces their conferees for the Clean Air Act Amendments of 1990, they are as follows: Senators Quentin Burdick (D-ND), Daniel Patrick Moynihan (D-NY), George Mitchell (D-ME), Max Baucus (D-MT), John Chafee (R-RI), Alan Simpson (R-WY), David Durenberger (R-MN) as well as Lloyd Bentsen (D-TX) and Bob Packwood (R-OR) of the Finance Committee for the fee-related provisions only, all other confere are Senate Environment and Public Works Committee members**

- **JUNE 28, 1990 – the House of Representatives announces their conferees for the Clean Air Act Amendments of 1990 – the list includes 138 House Members overall with representation from seven committees, the six committees other than the Energy and Commerce will have jurisdiction over their individual areas**

- **July 13, 1990 – House and Senate Clean Air Conferees hold their first joint conference. During the first session, the conferees selected Senator Max Baucus (D-MT) as the Conference Chairman**

- **October 22, 1990 – House and Senate Clean Air Conferees reach final agreement on Clean Air reauthorization and thus conclude conference negotiations**

- **October 26, 1990 – The House of Representatives considers the conference report and passes the measure with a 401 - 25 roll call vote**

- **October 27, 1990 – The Senate considers the conference report and passes the measure with an 89 - 10 roll call vote**

- **November 13, 1990 – S. 1630, "The Clean Air Act Amendments of 1990," is submitted to the President**

- **November 15, 1990 – The President signs the Clean Air Act Amendments**

3. WATER POLLUTION CONTROL

3.1 Introduction

The National Pollutant Discharge Elimination System (NPDES) applies to all sources of pollutants discharging, or having the potential to discharge, into waters of the United States. The program was initiated under the auspices of the Clean Water Act (CWA), sections 318, 402 and 405. The United States Environmental Protection Agency (EPA) and authorized state agencies enforce compliance with NPDES permitting requirements.

Authority to issue and enforce NPDES permits is granted to states which apply for primacy after they have promulgated regulations that are the equivalent of, or more stringent than, EPA rules established under the authority of the CWA. Failure to comply with any requirements stated in an NPDES permit is a violation of the CWA, whether the permit was issued by a state or by the EPA.

The following text summarizes the current NPDES program that may affect EOR operators. However, it is noted that the Clean Water Act was amended in April, 1991. Copies of the amended CWA are not available as of this date.

3.2. Permit Requirements

Every operation that will discharge wastewater of any type, in any volume, must obtain an NPDES permit for that discharge. In states that have received delegation of federal authority (primacy) only one permit will be

needed. In states that do not have federal authority, the regional EPA office will issue the NPDES permit, and a separate state permit may also be required.

When a facility is owned by one person but is operated by another, it is the operator's duty to get the permit, and the application shall be filed at least 180 days before the date when discharge is to commence (40 CFR Parts 122.1 and 123.25). An NPDES permit is valid for a fixed period of time, usually five years.

Permits should prescribe self-monitoring procedures, frequency of analysis, and accompanying reporting requirements as well as effluent limitations and compliance schedules. Many state issued NPDES permits already contain all of these provisions.

All records associated with monitoring must be maintained by the facility and available for a three year inspection period in conformance with 40 CFR Part 122.41. Discharge monitoring shall be done at least once a month, or at a greater frequency as may be required by the NPDES permit. Reports are submitted to the appropriate state agency or the EPA once a month, regardless of the self-monitoring sampling and analysis frequency. Discharge monitoring reports (DMR) must include every sampling and analysis done during the previous calendar month.

EOR operations can generate hydrocarbons, produced water, well treatment chemicals, storm water drainage, wastewater, and in thermal operations boiler blow down and associated chemicals. All of these materials are subject to NPDES rules. Generally speaking, because the effluent

limitations for oil set very strict limits on discharges, compliance with water quality standards should not be a problem for EOR operations.

Any spill of oil, of any volume, where the oil can or does enter any water must be reported immediately upon discovery to the federal government and to the state government. The owner of the source of a spill is responsible for the costs of containment and clean-up. Failure to report a spill may be penalized or punished as a criminal offense by the federal government and the state.

Permittees who fail to comply with permit conditions are subject to enforcement action. Any noncompliance is grounds for permit termination, revocation or modification; or denial of a permit renewal application. Any person who violates the Clean Water Act is subject to the imposition of a civil penalty not to exceed $25,000 per day for each violation. Negligence can result in criminal penalties up to $25,000 per day for each violation, or imprisonment for not more than one (1) year, or both. A person who knowingly violates applicable CWA statutes shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment for not more than three (3) years, or both (40 CFR Part 122.41, Sub-part C). State fines and/or prison terms are applied in addition to federal penalties.

3.3 Spill Prevention

Operators of chemical EOR facilities need to be concerned with EPA rules on spills of hazardous substances. These rules identify over 300 hazardous substances, divided into five categories based on their relative degree of hazard to health and the environment. Spills of more than a

designated amount of a substance in each class must be reported and controlled. For the most hazardous class, the spill quantity triggering the rules is one (1) pound; for the least hazardous class, 5,000 pounds.

Facilities handling or storing toxic substances (which include most substances on the hazardous substances list) may be required to adopt "Best Management Practices" to prevent run-off, drainage or spills. The EPA determined best management practices for each category and require their implementation through the NPDES permits.

4. UNDERGROUND INJECTION CONTROL

4.1 Introduction

The Underground Injection Control (UIC) program is included under Part C of the Safe Drinking Water Act (SDWA), and to the extent that the regulations deal with hazardous waste, the Resource Conservation and Recovery Act (RCRA).

The Regulations establish minimum requirements for UIC programs. Each state must meet these requirements in order to gain primacy enforcement authority. No underground injection is permitted in any state without first obtaining a UIC permit from the state or from the EPA. No injection shall be authorized by permit or rule if it results in the movement of fluid containing any contaminant into any underground sources of drinking water.

Five classes of injection wells were created in the UIC program:

Class I Wells used by generators of hazardous waste or owners or operators of hazardous waste management facilities to inject hazardous waste beneath the lowermost formation containing, within 1/4 mile of the wellbore, an underground source of drinking water.

Class II Wells which inject fluids:

(1) Which are brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production and may be commingled with

waste waters from gas plants which are an integral part of production operations unless those waters are classified as hazardous waste;

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

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

Class III Wells which inject for extraction of minerals.

Class IV Wells used by generators of hazardous waste or of radioactive waste for injection into a formation which, within 1/4 mile of the well, contains an underground source of drinking water.

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

Enhanced oil recovery operators are particularly interested in Class II injection wells. On rare occasions an EOR operator may use a Class I injection well.

4.2 A Typical State UIC Program

With few relatively minor variations, state UIC programs are similar to each other and vary little from EPA guidelines. Over half of the oil and gas producing states use a similar type of agency to regulate Class II wells. Those agencies also control well spacing, pooling and proration. They utilize the services of other state agencies which employ technical skills, such as biology, chemistry, mathematics and petroleum engineering, to assist them.

After filing an application for drilling or converting a well to a UIC well by using state designed forms and providing accompanying supporting

details, an applicant must give public notice of his application, wait for public comments and go through at least one hearing before he can expect to receive approval or denial of his application. The process can take anywhere from three to twelve months, depending on the completeness of the application and the workload of the permitting agency. Sometimes, if no public protest is received, no hearing is required.

An applicant for a UIC permit is required to supply at least the following information.

1. A complete description of the property; operator's name, address, telephone number, ownership status.
2. Activities conducted by the applicant which requires it to obtain permits under UIC, RCRA, NPDES or PSD and any other environmental permits.
3. Statement whether the facility is on Indian lands.
4. A brief description of the nature of the business and up to four (4) SIC codes which best describe the principal products or services provided by the facility.
5. Description of materials being injected into the well.
6. Maps showing the injection well or project area for which a permit is sought, showing the locations and identities of all existing wells within the area, locations of surface and subsurface bodies of water, mines, quarries, formation faults, plus surface features showing the location of residences, roads, and topography. This requirement does not apply to existing Class II wells seeking permit renewals.

7. Appropriate geological data on the injection zone and confining zone including lithologic description, geologic name, thickness and depth, and depth to bottom of all underground sources of drinking water which may be affected by the injection.
8. Drawings of the surface and subsurface construction details of the well.
9. Corrective action plan to cope with well failures so as to prevent the migration of contaminating fluids into an underground source of drinking water.

Public notices of an application for a UIC permit are sent to:

1. Copy of the application mailed to each surface owner within 1/4 or 1/2 mile of the project.
2. Copy of the application mailed to each offset operator.
3. Copy of the application with attachments and exhibits filed with the state controlling regulatory agency.
4. Affidavit of compliance with the mailing requirements to surface owners and offset operators must be filed with the state controlling regulatory agency.
5. Publication of the application at least once in a newspaper of general circulation in the county or counties in which the project is located.
6. Proof of the above publication must be submitted to the agency before an order may be issued.

Some states require wider distribution of public notices than that described above.

Every state which permits EOR UIC Class II projects reserves the right to inspect facilities and to have access to project records at any time, and state so in their permit conditions. Most state UIC regulations use terms "EOR project" and "well" to distinguish requirements applicable to the whole project from those applicable to individual EOR injection wells and disposal wells.

Permits authorizing injection wells usually comprise two steps: construction and operation. The first is valid for a fixed period of time, seldom more than 18 months. If no construction is done during the permit period, the permit is voided. The operating permit typically is valid for the life of the project. Some are valid for a fixed period of time.

The state agency regulating the UIC program can suspend, modify or revoke a permit at any time for just cause. Causes generally include: a change in conditions from when the permit was granted; lying on the original application; falsifying monitoring reports; noncompliance; willful violation of permit conditions; transfer of ownership; termination of the project; and unacceptable pollution.

Operators whose EOR alternatives include fresh water use are advised to thoroughly research the water sources and projected needs of the public water supply systems in the project region, agricultural demand for fresh water, and the current law of water rights in the relevant jurisdiction. To avoid conflict with competing users of water, operators should communicate with state water resource boards, geological surveys, regional planning commissions, regional EPA offices and state universities.

A completion report must be filed with the appropriate state controlling regulatory agency within a few days (usually 15 days) following completion or conversion to disposal or injection well. Operators are required to conduct a mechanical integrity test before beginning injection operations. The state is notified a few days before the test so that it may send an inspector to the site to witness the test.

The state is notified within a few days following start-up of injection operations. Thereafter at least one injection pressure reading is taken every month, recorded and reported to the state controlling regulatory agency. Records are kept for a minimum number of years (usually three) after each test. Mechanical integrity tests are conducted at least once every five years. Every mechanical integrity test is done in the presence of a state inspector.

Any leaks, accidental discharge or other downhole problem must be reported to the local state controlling regulatory agency office via telephone or other verbal means as soon as possible, but within 24 hours of discovery. A written report shall be submitted within a few days after discovery, in which the incident is described in detail and it shall describe any corrective measures being implemented or planned.

Plugging and abandonment of EOR injection wells and disposal wells must conform to statewide rules. Most states require advance notice so that a state inspector can witness the plugging. All states require a formal report to be filed within 30 days after plugging.

5. HAZARDOUS WASTE MANAGEMENT

5.1 Introduction

The federal Environmental Protection Agency has determined that EOR fluids are not hazardous wastes, as extracted from 40 CFR, part 261.4: "Exclusions --- Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy." Most states do not require EOR operators to comply with hazardous waste regulations if they have UIC and NPDES permits or their equivalent.

5.2 Hazardous Waste

The federal Resource Conservation and Recovery Act defines "hazardous waste" as "a solid waste or combination of solid wastes, which because of its physical, chemical or infectious characteristics.....may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." "Solid waste" includes liquid, semisolid or contained gaseous material.

A "solid waste" is considered to be a hazardous waste if it meets one or more of the following criteria:

1. It has been found to be fatal to humans in low doses;
2. It has a flash point less than 60°C (140°F);
3. It is aqueous and has a pH less than or equal to 2, or greater than or equal to 12.5;

4. It is normally unstable, readily undergoes violent change without detonating and reacts violently with water.

However, EOR operations which use or dispose of potentially hazardous chemicals for injection are subject to RCRA. This includes chemicals stored in drums or in tanks or in earthern enclosures. RCRA permits are required under those conditions.

Earthern enclosures or surface impoundments must include a liner to prevent leaching into the soil in accordance with 40 CFR, parts 267.31 through 267.33 and 264.118. Design and operating standards emphasize protection of surface and groundwaters.

If drums or tanks are used to store chemicals, they must be placed or set within earthen enclosures. If the earthern enclosure or surface impoundment is to be used as a wastewater discharge pit, it must be covered and fenced to prevent the entry of birds, humans and animals, and shall be equipped with wells to monitor leachate and to pump out any leachate that is detected. Such impoundments shall be provided with piping systems to pump out accumulated fluids to prevent spills when fluid levels reach within two feet of the top of the dikes. Pumped out fluids can be discharged into a Class I well if so equipped, or into properly licensed transports for commercial disposal, or spread onto roads in areas where states permit it to be done.

Thermal enhanced oil recovery (TEOR) usually involves steam generators which are fueled by either crude oil, fuel oil or natural gas. Crude

oil and fuel oil combustion may cause SO_2 to be discharged to the atmosphere. If the quantity of discharged SO_2 is large enough, it will have to be scrubbed before the exhaust or flue gas reaches the open atmosphere (see air pollution sections of some state regulations). The scrubbed SO_2 becomes a non-hazardous liquid with a neutral pH. Other waste liquids from TEOR include regeneration brine, soft water blowdown, excess deionized water and backwash water, all of which must be disposed of. Flue duct ash and refractory waste are also commonly generated. Although these wastes are usually non-hazardous, they can contain heavy metals which require them to be disposed of in approved areas.

5.3 The American Petroleum Institute

The American Petroleum Institute published a report in 1989 entitled "Onshore Solid Waste Management in Exploration and Production Operations". It offers a wealth of information, in general terms, on the handling of wastes associated with exploration and production activity.

The address and telephone number for obtaining the report is:

American Petroleum Institute
Production Department
1220 L Street, Northwest
Washington, D.C. 20005
Telephone: 202/682-8058.

6. MAJOR FEDERAL LAWS AFFECTING SITING OR OPERATION OF EOR FACILITIES

6.1 The National Environmental Policy Act of 1979 (NEPA)

NEPA requires federal agencies to prepare environmental impact statements (EIS's) for every "major federal action significantly affecting the quality of the human environment." The following types of permits or other federal actions that may commonly apply to EOR operations are covered by the requirement:

1. EPA-issued NPDES permits for "new sources".
2. EPA-issued permits for hazardous waste facilities under RCRA.
3. Corps of Engineers permits for construction in navigable waters, or for disposal of dredge and fill.
4. Leases of federal land for oil production (including the outer continental shelf).
5. Rights-of-way across federal lands for roads, pipelines, power lines.
6. Federal financial support or technical cooperation in an operation.

Except for the NPDES permit for "new sources", and RCRA permits for hazardous waste facilities, EPA permits for construction or operation do not require EIS's.

The Council on Environmental Quality (CEQ) has published rules and regulations specifying the type of actions that are "major" or "significantly

affect" the environment, and describing the procedures for preparing an EIS (40 C.F.R. Part 1500, 43 Fed. Reg. 55978). The regulations seek to focus EIS's on the key issues by "scoping" the EIS at the start; they also set limits on the length of an EIS. Whenever an EIS may be necessary, the federal agency must at least perform an environmental assessment and prepare a "negative declaration" explaining why a full EIS is not required for the particular action. The EIS will be reviewed by the EPA, but the agency sponsoring the action has the final say about the adequacy of a statement.

It takes a long time to prepare an EIS and defend it, if necessary, in court; from the initial permit application to final approval will usually take about a year, often longer. Therefore, if at all possible, the project should be sited and designed either to avoid NEPA altogether or to minimize the environmental impact so that the agency can issue a "negative declaration".

6.2 The Coastal Zone Management Act (CZMA)

The CZMA was enacted to protect environmentally valuable shorelines, coastal wetlands and near shore areas of the nation from haphazard and thoughtless development. The CZMA does not impose automatically binding controls on activities in the coastal zone. Rather, it sets national goals for management of the coastal zone, and requires state management programs to consider certain interests and values (e.g., energy, recreation). Each coastal state then has responsibility for establishing a program and set of administrative procedures for managing development of the coastal zone.

Each state program must include the following elements:

1. Identification of the landward boundary of the coastal zone.
2. Declaration of permissible land and water use.
3. Inventory of areas of particular concern.
4. Administrative program to control land and water uses.
5. Guidelines for priorities of uses in particular areas.
6. Organizational structure to implement the program.

If the state program meets federal standards, and serves the national goals, the federal government will approve it and help defray its costs.

Typically, the coastal zone includes all marshes, bays, and estuaries and a narrow strip of land (e.g., 1/4 mile) adjacent to these water bodies. The plans generally characterize the priority values of different portions of the coastal zone, such as fish spawning, recreation, energy facility siting, or ecological preservation. All private activities in the coastal zone are reviewed by state or regional government agencies to assess their compatibility with the stated management policy for the particular site or type of area. The state will not allow nonconforming activities to proceed, nor may any federal agency issue a permit for a facility that does not meet the requirements of the state's plan. An applicant for a federal permit must certify compliance with an approved plan, and the state has six months to object to such a certification.

6.3 The Endangered Species Act

Most environmental laws cover specific types of pollution or specific areas of land or water. The Endangered Species Act takes a different approach: it protects endangered species of animals or plants wherever they happen to

exist. The Department of the Interior maintains the official list of endangered species, which includes hundreds of animals and plants throughout the country.

Although the Endangered Species Act absolutely prohibits federal actions (including permits) that would threaten the continued existence of a species or affect its "critical" habitat (except in rare instances after review by a special cabinet-level board), the prohibition has more significance for federal projects covering large land areas (dams, highways) than it does for projects like oil wells that are privately controlled and use only small, discrete parcels of land. It is unlikely that a single well, or even a field of wells, will disrupt the environment so much that it threatens the continued survival of some animal or plant. Therefore, most EOR operations will not be categorically prohibited because of an endangered species in the area. However, operators should be aware that any killing, harming, capturing, or other interference with any endangered species is a crime.

Short of an absolute prohibition on an activity, the Endangered Species Act may require relocation of the well site or associated roads and structures or redesign of the equipment and operations to avoid or reduce the effect on an endangered species. These mitigating measures will most often be required where the need for a federal permit necessitates permit coordination with the Fish and Wildlife Service of the Department of the Interior or the National Marine Fisheries Service of the Department of Commerce, the two agencies supervising endangered species protection. For example, the Corps of Engineers consults with these agencies before issuing any permits.

If you have any reason to believe that an endangered species may be in your project area, or if you are not familiar with the local ecology, it would be wise to check with federal or state fish and game personnel and if so, what special measures may be necessary to protect them.

6.4 The Toxic Substances Control Act (TSCA)

Congress passed TSCA in 1976. Its potential for future importance is very high. Operators of chemical EOR facilities are the most likely to be affected.

TSCA imposes direct controls on the manufacture, sale, use, and disposal of chemical substances determined to be toxic to man or the environment. Its key feature is a requirement for pre-market notification and testing of new chemical substances produced or generated in more than laboratory scale quantities. By this mechanism, most highly toxic chemicals will never be approved for commercial or industrial use. Existing chemicals may also be regulated to eliminate or reduce the risks posed by their toxicity. For example, the ban on most uses of PCB's was imposed under TSCA.

Users of chemical substances will be notified of restrictions on use or disposal through container labels. Should your chemical EOR process actually create, or generate, chemical substances, however, you will be responsible for reporting your operation to EPA. If the chemical you are generating is a new one, you will have to supply test data to EPA for evaluation, and your generating activity may be restricted or prohibited until the evaluation is complete.

6.5 The Noise Control Act

Most oil production facilities generate a fair amount of noise and the controls on noise in populated areas may pose a serious problem for operators. In this instance, however, federal law plays virtually no part. The federal statute principally authorizes EPA to set noise emission standards for specific sources (e.g., trucks, lawn mowers). No standards have been set or are contemplated for stationary internal combustion engines. Otherwise, noise control is considered a matter for state and local regulation. To determine what noise standards may apply in your project area, contact the local municipal or county government.

6.6 Facilities on Federal Lands

Several federal agencies manage large tracts of land in oil-producing areas, notably the Bureau of Land Management in the Department of the Interior and the Forest Service in the Department of Agriculture. The land-managing agency will control access to and activities on its lands according to its individual program objectives and regulations. It is beyond the scope of this handbook to describe these rules in detail, but the larger agencies and their principal regulations are listed in Table 6-1 for reference.

In addition to the particular agency managing federal land, oil explorers and producers will be regulated by the U.S. Geological Survey (USGS). The USGS is the federal government agency primarily responsible for the permitting and regulation of oil and gas production on federal lands. The regulations of USGS, which appear in the Code of Federal Regulations at 30 C.F.R. Part 221-226, are similar to corresponding state rules, establishing rules and procedures for well casing, drilling requirements, well

abandonment, and so forth. The regulations are supplemented by Notices to Lessees (NTLs), of which NTL-2B, Disposal of Produced Water, and NTL-3A, Pollution Reports are of direct interest.

NTL-2B (40 Fed. Reg. 57814) governs disposal of produced water; it also covers water injection, but not injection of steam or chemicals. Generally, it requires produced water to be injected into the subsurface or disposed of in lined pits. It also requires applications for produced water disposal to be filed with the district engineer.

TABLE 6-1

MAJOR FEDERAL LAND AGENCIES AND LEASING REGULATIONS

Bureau of Land Management

- Pre-lease environmental assessment
- Mineral leasing requirement
- Pipeline rights-of-way
- "Surface Disturbance Stipulations"
- "Guidelines for Oil and Gas Lease Drilling Operations and Reclamations"
- Areas of critical environmental concern
- Wilderness area reviews (no production allowed in wilderness areas)

Forest Service

- Lease requirements
- Guidelines for minimizing surface damage
- Wilderness reviews (RARE - Roadless Area Review and Evaluation)

Bureau of Reclamation

- Controls on use of reservoir areas and injection systems

Bureau of Indian Affairs

- Leases must be negotiated with the individual tribe, but are subject to BIA approval
- Regulation of surface activity by tribe
- Regulation of "downhole" activity by USGS

7. MISCELLANEOUS

7.1 Oil and Gas Producer Environmental Discussions

Discussions with four major oil company environmental regulations coordinators and managers revealed an almost uniform approach exists toward compliance with Federal and state laws, rules and regulations. Each of those companies maintain headquarters staff comprised of specialists in environmental regulatory affairs. They provide coordinators in their region or division offices with technical support services. Headquarters specialists keep abreast of current and anticipated changes in environmental pollution control regulations by legislatures in every state within which they conduct exploration and production activity. They maintain frequent contacts with federal Environmental Protection Agency offices, and with other federal regulatory agencies as appropriate.

The Oklahoma section of the Society of Petroleum Engineers conducted an environmental seminar in Oklahoma City on June 4-5, 1991. A majority of attendees were independent oil and gas producers. Many of them were concerned that the costs for compliance with environmental regulations would be prohibitive, forcing them out of business. They were particularly wary of RCRA and NPDES regulatory effects. Generally, the smaller operators were not cognizant of what is required or why the regulations are necessary when they entered the meeting. Most attendees left the seminar feeling somewhat more knowledgeable about environmental regulatory affairs, and considered the seminar to be well worthwhile.

7.2 Tougher Discharge Rules are Coming

Congress exempted oil and gas wastes from compliance with hazardous waste disposal regulations when it enacted the Resource Conservation Recovery Act (RCRA) in 1980. The exemption allows operators to put salt water, caustic soda and other drilling and production wastes into disposal pits or disposal injection wells. Congress is considering eliminating this exemption. It will probably be enacted sometime in the year 1992. Independent oil producers are anticipating vastly increased production costs when the exemption is lifted, and are seeking congressional relief. (Ref.: Tulsa World, p. 6C, Monday, July 15, 1991.)

Louisiana's Department of Environmental Quality enacted a rule in April, 1991, which prohibits unpermitted discharges of waste water, waste oil, drilling fluids and cuttings, and stormwater runoff from oil and gas exploration and production sites into state waters by January 1, 1995. The Louisiana Independent Producers and Royalty Owners Association (LAIPRO) is lobbying to challenge the new rule or to have the legislature provide tax credits to offset the cost of compliance.

8. STATE REGULATIONS

ALABAMA

AIR POLLUTION

Agency in Charge:	Air Division Alabama Dept. of Environmental Management 1751 Congressman W.L. Dickenson Drive Montgomery, Alabama 36130 205/271-7700
Key Laws or Regulations:	Alabama Air Pollution Control Act, Alabama Air Pollution Control Rules and Regulations; CFR 40-52, CFR 40-60, CFR 40-51.
Permits Required:	An air permit is required for any new source of air contaminants which will emit 50 tons or more per year of air pollutants. Applications should be filed at least 60 days prior to commencement of new construction or alteration on forms prescribed by the director. He may take up to one (1) year to approve a completed application. The permit comprises two phases: construction, which must be started within 18 months after project approval by the Director, and operating. Application for new construction or alteration shall comply with CFR 40-51.166 which requires a plan to provide measures for preventing serious deterioration (PSD) of air quality, plus a complete description of the facility and existing ambient air quality of the area. Air (operating) permits are granted upon completion of construction and after inspection by the Division to verify compliance with construction permit specifications.

Program Description:

The operator shall continuously monitor air quality emissions and submit semi-annual reports to the Air Division on forms provided by the Division.

A pollution source will be considered to cause or contribute to a violation of a national air quality standard when the emission(s) exceed the following level(s):

	Average Time (hours)				
Pollutant	Annual	24	8	3	1
PM_{10}	1.0μg/m^3	5μg/m^3	--	--	--
SO_2	1.0μg/m^3	5μg/m^3	--	25 μg/m^3	--
NO_x	1.0μg/m^3	--	--	--	--
CO	--	--	0.5mg/m^3	--	2mg/m^3

Note: PM_{10} = Particular matter, dia ≤10 micrometers
μg/m^3 = Microgram/cubic meters
mg/m^3 = Milligram/cubic meter

No operator shall permit the visible emission of particulate matter, smoke, vapors or other air contaminants which will cause a shade or density greater than 20% equivalent opacity.

All excess emissions shall be reported to the Air Division as soon as possible within 24 hours, and within 15 days shall submit a written report which will include plans for correction measures, if applicable.

Enforcement:

The Department of Environmental Management can levy fines up to $1,000 per day for violations. Each day that a condition of violation exists is considered a separate violation. Willful acts of violation can result in imprisonment.

Other Considerations:

EOR operators seeking more specific details will need to contact the Air Division, Alabama Department of Environmental Management.

ALABAMA

WATER POLLUTION

Agency in Charge:

Water Division-Water Quality Program
Alabama Dept. of Environmental Management
1751 Congressman W.L. Dickenson Drive
Montgomery, Alabama 36130
205/271-7700

Key Laws or Regulations:

Alabama Water Pollution Control Act, Act No. 1260, Laws of 1971; Code of Alabama, 1975, Art. 22-22-1 to 22-22-14 and Art. 22-22A-1 to 22-22A-16; Amendments August 26, 1988-March 2, 1990-April 3, 1991.

Permits Required:

State issued NPDES permit.

An NPDES permit has a fixed term of five years, but may be renewed by proper application for renewal [Rules 335-6-6-.05 and 335-6-6-.06].

Applications shall be made on forms designated by the Director, including all information required under CFR 40 Subpart B, Sect. 122.21 where applicable, plus all other information required by the Director as delineated in Rule 335-6-6-.08. Those operators applying for a permit re-issuance need to provide the same detailed information required for new permit applications.

The Department may require that an application for an NPDES permit provide additional reports, specifications, plans and other information to assess the potential water quality impact of discharges.

Applicant shall keep records of all data used to complete application form and any supplemental information provided, for a period of at least three years from the date the application is signed.

The permit may be modified, revoked and re-issued, suspended, or terminated for cause.

Applications for new permits, modifications and permit re-issuance shall be submitted at least 180 days prior to the desired date for commencement or expiration date.

Program Description:

The EOR operator permittee shall at all times properly operate and maintain all facilities of treatment and control which are installed or used to achieve compliance with the conditions of the NPDES permit. Ref. Rule 335-6-6-.12.

Monitoring shall be conducted by the operator according to test procedures approved under CFR 40 Part 136 unless other test procedures approved by the Director are specified in the permit.

All monitoring information records shall be retained for at least three years from the date of each sample measurement, report or application, at the permitted facility or at an approved alternate location.

Monitoring reports shall be submitted monthly or at another frequency determined by need, on the Departments "Discharge Monitoring Report" form; but in no case less than once a year.

Compliance:

Any condition of noncompliance which may endanger health or environment shall be orally reported to the Director within 24 hours of becoming aware of it [Rule 335-6-6-.12 (1) 6].

The operator shall also submit a written report within five days after becoming aware of the condition. The written report will contain a detailed accounting of the incident and a description of steps being taken to reduce or eliminate the noncompliance and to prevent its recurrence.

When an operator is not in compliance with a permit, the Director may suspend the permit until the operator has taken necessary action(s) to achieve compliance. The Director may refuse to

approve a permit application for another facility owned or controlled by the operator within Alabama whenever it has been determined that an existing facility is in a condition of continued or substantial noncompliance.

Enforcement:

Any person required to have an NPDES permit, who violates the conditions of the permit, or who discharges pollutants not authorized by the permit, is subject to any or combination of enforcement actions:

(a) An administrative order requiring compliance, mitigation, cessation, clean-up and/or penalties;
(b) An action for damages;
(c) An action for injunctive relief;
(d) An action for penalties.

ALABAMA

UNDERGROUND INJECTION CONTROL

Agency in Charge:

Water Division-Water Quality Program
Alabama Dept. of Environmental Management
1751 Congressman W.L. Dickenson Drive
Montgomery, Alabama 36130
205/271-7700

Key Laws or Regulations:

Alabama Water Pollution Control Act, Act No. 1260, Laws of 1971; Code of Alabama, 1975, Art. 22-22-9, 22-22A-5, 22-22A-6, 22-22A-8; Amendments June 10, 1982-April 15, 1983-October 10, 1984.

Permits Required:

Class I wells - injection wells used to inject pollutants beneath the lowest underground drinking water source may require UIC permits.

Class II wells - injection wells used to inject brine or other fluids for enhanced recovery of oil or natural gas production - are exempt from requiring UIC permits unless 'hose waters are classified as hazardous waste [Rule 335-6-8-.06].

Class III Wells - injection wells used for extraction of fossil fuels via in-situ combustion require UIC permits [Rule 335-6-8-.02 (j)].

The construction of any Class I well is prohibited unless it is an approved replacement for an existing well and is to be operated for a period of time determined by the Department to be necessary for transition to surface treatment and disposal of waste [Rule 335-6-8-.08 (5) (6) and 335-6-8-.09 (4)].

Permits for Class I wells may be issued for any time period, but in no case shall the permit be issued for more than 10 years.

Permits for Class III wells may be issued for any time period up to the life of the well, but shall be reviewed at least once every five years.

The rules for permitting application requirements and procedures for Class I and Class III injection wells UIC permits are Rules 335-6-8-.09; 335-6-8-.10; 335-6-8-.11; 335-6-8-.13.

Program Description:

Class I injection wells shall be sited so that they inject into a formation that is beneath the lower most underground source of drinking water (USDW) located within five miles of the well.

Construction of injection wells and surface facilities shall comply with Rules 335-6-8-.21 and 335-6-8-.22.

The operation of a Class I or Class III well lacking mechanical integrity is prohibited. Mechanical integrity tests are done on completion and at least once every two years thereafter.

Monitoring of injection wells shall be done in accordance with EPA approved methods (CFR 40, Part 146.68) and procedures.

Monitoring reports shall be submitted monthly and mechanical integrity tests plus any well work shall be reported in the next monthly monitoring report. Groundwater monitoring shall be done at least quarterly [Rule 335-6-8-.13]. Records and copies of reports are kept for at least five years.

Compliance:

A compliance schedule for taking corrective action regarding improper seals or leaks, completed or abandoned wells, is included in the UIC permit. Requirements vary on a case-by-case basis. A provision for a plugging and abandonment plan is also included in the permit.

The Director shall be notified within 24 hours upon discovery of an operational problem causing pollution of surface water or a USDW, and injection operations shall cease immediately [Rule 335-6-8-.13 (p)].

	Noncompliance can result in revocation of the permit [Rule 335-6-8-.17].
Other Considerations:	The State Oil and Gas Board of Alabama administers rules and regulations governing Class II wells.

UNDERGROUND INJECTION CONTROL

– Class II Wells –

Agency in Charge:

State Oil and Gas Board of Alabama
420 Hackberry Lane, P.O. Box 0
Tuscaloosa, Alabama 35486-2852
205/349-2852

Key Laws or Regulations:

Rules and Regulations Governing the Conservation of Oil and Gas in Alabama, Oil and Gas Statutes of Alabama.

Permits Required:

Application for permits for Class II wells is considered to be a two-step process. The first requires obtaining a permit to drill or convert a well for injection purposes [Rule 400-1-2], using application forms provided by the Board Supervisor. The second step is the filing of an application for a permit for the injection of fluids, using forms provided by the Supervisor.

Each phase requires the applicant to file a request in writing for permit application forms.

Application forms must be completely filled with extensive detailed information and be accompanied by a plat, wellbore sketch, log through the injection zone, a statement describing the injection fluids, estimated fluid volumes and pressures, proof of public notification.

Operator may apply for a field-wide permit, but shall provide complete information on each injection well in the program.

A permit shall expire six months from the date of issuance if the permit well is not spudded, if no fluids have been injected or the date of the last submitted Form OGB-17, whichever is longer, unless approved by the Supervisor.

Program Description:

The operator of any Class II injection well shall daily record well pressure readings or compute them as a daily average on the basis of at least one measurement per week. The data shall be submitted by the 28th day of every following month on Form OGB-17.

A chemical analysis of injected fluids shall be submitted by the first of January each year following initial approval.

In addition to submitting data required under Rule 400-1-5-.01 and 400-1-5-.02, the operator shall maintain additional monitoring records required by the Supervisor, including

1. All calibration and maintenance records;
2. Pressure data;
3. Nature and composition of injection fluids.

These records shall be maintained for a minimum of three years.

The EOR operator shall immediately notify the Supervisor in the event of any mechanical or downhole problems resulting from operation of the well which may endanger an underground source of drinking water.

Enforcement:

The Board may order the closing of all or any part of the drilling, production or other operations of any operator for failure to comply with any rule, regulation or order by the Board. In addition, there may be other penalties where the continuance of such failure to comply is considered by the Board to endanger the public or where substantial pollution is occurring, or is in imminent danger of occurring.

The Alabama Department of Environmental Management and the Federal Department of Energy have authority to levy fines for willful violation of environmental protection laws.

ALABAMA

HAZARDOUS WASTE DISPOSAL

Agency in Charge:	Land Division Alabama Dept. of Environmental Management 1751 Congressman W.L. Dickenson Drive Montgomery, Alabama 36130 205/271-7700
Key Laws or Regulations:	Alabama Hazardous Waste Management Act
Permit Required:	National Pollutant Discharge Elimination System (NPDES) permit.
Program Description:	Rules governing the construction and abandonment of drilling pits are administered by the State Oil and Gas Board of Alabama [Rule 400-1-5-.03].
	Rules governing the disposal of drilling muds and pit fluids are administered by the Department of Environmental Management.
	Drilling muds and pit fluids may be disposed of by: (1) injection into a formation below underground sources of drinking water (USDW) or; (2) transport to a drilling mud treatment facility or; (3) applied to the land surface or landfill approved by the Department.
	Permit applicants are guided by NPDES rules described in the "Water Pollution" section of this summary of Alabama environmental protection regulations governing EOR operations.

CALIFORNIA

AIR POLLUTION

Agency in Charge:	California Air Resources Board 1102 Q Street, P.O. Box 2815 Sacramento, California 95812 916/322-2990
Key Laws or Regulations:	California Clean Air Act of 1988; California Health and Safety Code, AB2595, SHER, Chapter 1568.
Permits Required:	Construction permit and operating permit.

SEC. 7. Section 40001 of the Health and Safety Code stated that districts shall adopt and enforce rules and regulations to achieve and maintain state/federal ambient air quality standards within their areas of jurisdiction. Of the 31 districts throughout the state, eight have thermal EOR operations: Fresno, Kern, Kings, Monterrey, San Luis Obispo, Santa Barbara, South Coast, Ventura County.

In April, 1991, eight districts merged to form the "San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). The merged districts include Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare Counties.

The state has no specific permitting guidelines and rather than develop a synopsis for each district, rules from SJVUAPCD are summarized in the following text. They are fairly representative for most of the 31 districts. Readers are cautioned to go to districts of interest for specific details.

Steam generators, water boilers, closed heat transfer systems fired exclusively with natural gas or LPG and have a total burner maximum heat input rating less than 15 million Btu/hour are exempted from permitting.

An authority to construct permit and a permit to operate are required for any steam-enhanced crude oil production well, or any group of steam-enhanced crude oil production wells, served, or to be served by a vapor recovery system.

No person shall operate a steam-enhanced crude oil production well unless VOC emissions are reduced by at least 99 percent. Applicants for authority to construct shall submit to the Air Pollution Control Officer a control plan and construction schedule demonstrating that all well components will be installed and maintained in a no leak condition. Use forms provided by the district.

The operator of any new steam-enhanced crude oil production well, or any well converted to a steam-enhanced crude oil production, shall comply with SJVUAPCD Rule XXX permit requirements before beginning steam injection.

Program Description:

The operator of any steam-enhanced well shall maintain records of steam injection for at last two years.

Compliance testing shall be performed annually by the California Air Resources Board on all vapor collection and control systems used to control emissions from steam-enhanced crude oil production wells.

The operator of any existing steam-enhanced crude oil well, in existence prior to April 11, 1991, shall comply with the following revision schedule:

1. By November 1, 1992, submit to the Control Officer a control plan to achieve compliance with this rule and a complete application for Authority to Construct (permit) any proposed vapor collection system.

2. Within three months after issuance of an Authority to Construct for the vapor collection and control system, certify by letter to the Control Officer that contracts or purchase orders have been issued.
3. Within seven months after issuance of an Authority to Construct, complete construction, and have the vapor collection and control system in operation.
4. Within nine months after issuance of an Authority to Construct, demonstrate full compliance with these rules.

Enforcement:

A person who willfully violates the California Code of Regulations can be fined up to $1,000 for each violation, or by imprisonment not exceeding six months, or both.

Other Considerations:

Owners and operators are directed to call the following zones within SJVUAPCD for detailed instructions:

Bakersfield	805-861-3682
Fresno	209-445-3239
Hanford	209-584-1411
Madera	209-675-7823
Merced	209-385-7391
Modesto	209-525-4152
Stockton	209-468-3470
Visalia	209-733-6441

Owners and operators seeking specific information or instructions within any other district are advised to call the ARB in Sacramento first.

San Joaquin Valley Unified
Air Pollution Control District

FIGURE NO. 2

CALIFORNIA

WATER POLLUTION

Agency in Charge:	California Water Resources Control Board 901 P Street Sacramento, California 95814 916/445-3993
Key Laws or Regulations:	40 CFR, Rules 122, 123, 124, 125; 1991 Clean Water Act.
Permits Required:	NPDES permit.

The California Water Resources Control Board administers the state's program to regulate discharges to lakes, rivers and the ocean in accordance with Federal laws and regulations. State law established nine Regional Water Quality Boards, each of which have jurisdiction over the state's program within the region's boundaries. Decisions of the regional boards may be appealed to the State Board for review. Owners and operators are advised to contact the Executive Officer of the appropriate regional board for specific assistances and permits.

NPDES permits are issued to EOR operators only if they expect to generate a discharge that is subject to Clean Water Act (CWA) requirements. Permit applications shall be made on forms shown in Federal regulations but may be obtained from the WRCB.

If the wastewater to be discharged contains toxic substances, the operator must also contact the Toxic Substance Control Division of the Department of Health Sciences for a permit.

NPDES application forms require a complete description of the facility [well(s), mud pit, discharge pit, tank, etc.], location of nearest surface water, USDW, other wells, description of the expected discharge, volume, flow rate, method of treatment and disposal, and any other information required by the regional WRCB (Ref. 40CFR 122, Sub-part B).

Normally, approximately 120 days transpire between application date and issuance of an NPDES permit, but may extend up to a year depending on the completeness of the application and region WRCB schedule of priorities. An NPDES permit is valid for a fixed period of time not to exceed five years. It may be applicable to each well or it may be issued for an entire facility.

Program Description:

A water quality monitoring program shall be in place before beginning any discharges. Nearby surface waters and USDW shall be analyzed for organisms, the presence of toxic material, and abnormalities prior to initiating discharge, to provide baseline data.

The WRCB has authority to establish self-monitoring frequency, records keeping and reporting frequency. These requirements are set forth in the NPDES permit on a case-by-case basis. Reporting frequencies to the state vary from daily to annual, depending upon the environmental threat of the discharge. Dischargers are usually required to report monitoring results monthly if the discharge is continuous and not seasonal. The state will occasionally inspect the discharge and may collect samples as part of the inspection.

Spills shall be verbally reported to the WRCB and to the Department of Fish and Game as soon as possible after discovery. A pollution clean up plan shall be implemented immediately upon discovery, if possible. A written report shall be transmitted to authorities within five working days after discovery, citing all details of the spill and progress made to mitigate or eliminate the pollution.

Enforcement:

An operator found to be in noncompliance with any NPDES permit condition is violating the CWA. Penalties for noncompliance can be assessed by the state and the EPA either jointly or severally. If wildlife is endangered, the Department of Fish and Game may also assess penalties.

Negligent or willful violations can result in a fine of up to $10,000 per day, or one year in jail for each occurrence, or both.

Other Considerations:

The state also has a program to regulate discharges of waste to land, e.g., percolation ponds, evaporation ponds, water reclamation, etc. Of the approximately 7,000 regulated dischargers in the state, only 1,400 discharge their treated wastewater to surface waters and require NPDES permits. The State Water Resources Control Board has adopted regulations entitled "Chapter 15. Discharges of Waste to Land". Operators may be interested in knowing about this regulation.

STATE WATER RESOURCES CONTROL BOARD
P. O. Box 100, Sacramento, CA 95801

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

NORTH COAST REGION (1)
BENJAMIN D. KOR, EXEC OFFICER
1440 Guerneville Road
Santa Rosa, CA 95403
(707) 576-2220

SAN FRANCISCO BAY REGION (2)
STEVEN RITCHIE, EXEC OFF
75 Hawthorne St.
San Francisco, CA 94105
(415) 464-1255

CENTRAL COAST REGION (3)
WILLIAM R. LEONARD, EXEC OFF
1102-A Laurel Lane
San Luis Obispo, CA 93401
(805) 549-3147

LOS ANGELES REGION (4)
ROBERT P GHIRELLI, EXEC OFF
101 Centre Plaza Drive
Monterey Park, CA 91754
(213) 266-7500

CENTRAL VALLEY REGION (5)
WM H. CROOKS, EXEC OFF
3443 Routier Road
Sacramento, CA 95827-3098
(916) 361-5600

Fresno Branch Office
LOREN J. HARLOW
3614 East Ashlan Ave.
Fresno, CA 93726
(209) 445-5116

Redding Branch Office
JAMES C. PEDRI
100 East Cypress Avenue
Redding, CA 96002
(916) 225-2045

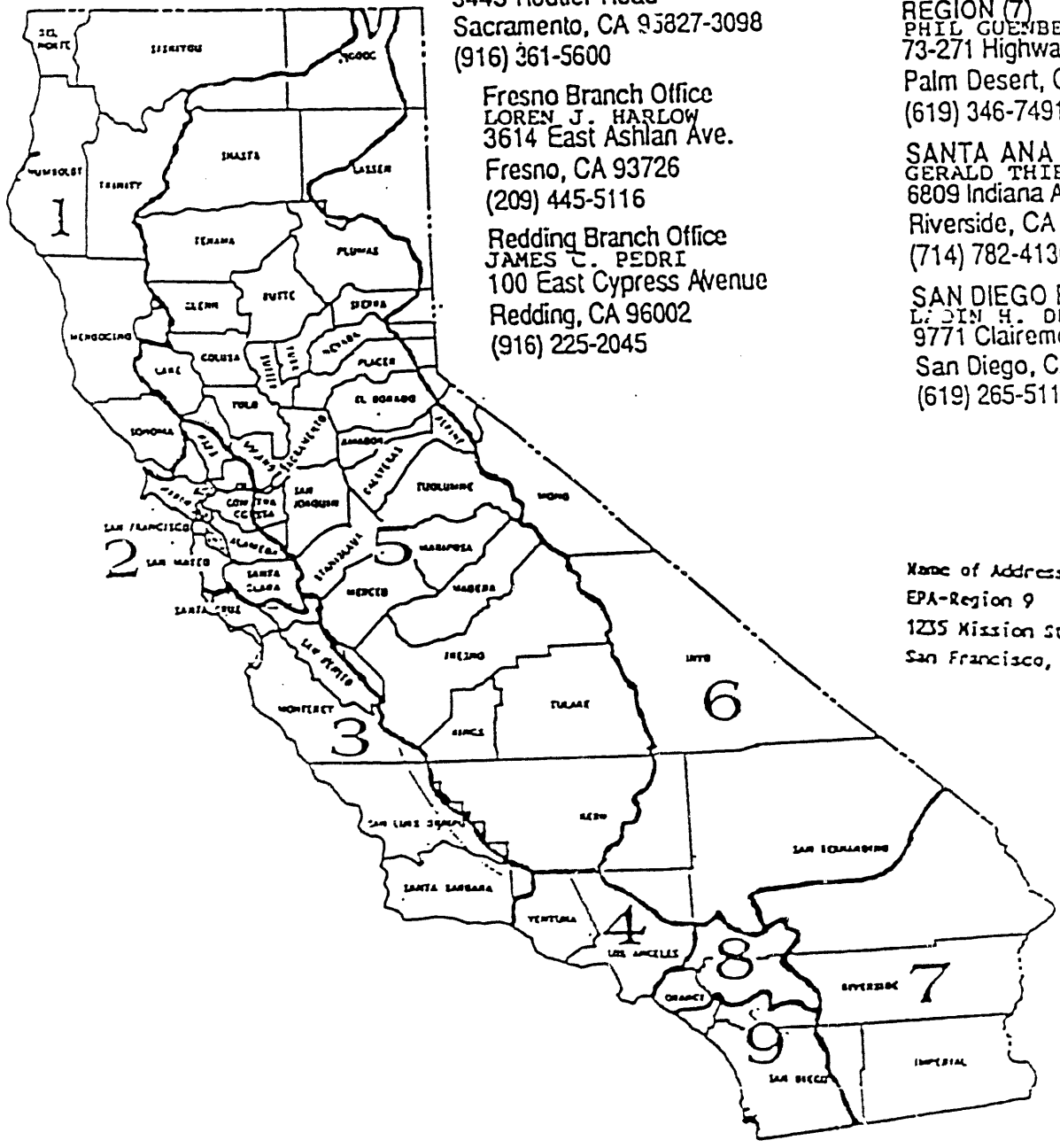
LAHONTAN REGION (6)
HAROLD J. SINGER
2092 Lake Tahoe Boulevard
P. O. Box 9428
South Lake Tahoe, CA 95731
(916) 544-3481

Victorville Branch Office
KEN CARTER
15428 Civic Drive, Suite 100
Victorville, CA 92392-2359
(619) 241-6583

COLORADO RIVER BASIN REGION (7)
PHIL GUENBERG, EXEC OFF
73-271 Highway 111, Ste. 21
Palm Desert, CA 92260
(619) 346-7491

SANTA ANA REGION (8)
GERALD THIBEAULT
6809 Indiana Avenue, Ste. 200
Riverside, CA 92506
(714) 782-4130

SAN DIEGO REGION (9)
LADIN H. DELANEY
9771 Clairemont Mesa Blvd. Ste.
San Diego, CA 92124
(619) 265-5114



Name of Addressee (Mail Code)
EPA-Region 9
1235 Mission Street
San Francisco, CA 94103

FIGURE NO. 3

CALIFORNIA

UNDERGROUND INJECTION CONTROL

Agency in Charge:	Department of Conservation Division of Oil and Gas 1416 Ninth Street, Room 1310 Sacramento, California 95814 916/445-9686
Key Laws or Regulations:	Division of Oil and Gas Manual of Instructions; California Code of Regulations, Section 1724.7.
Permits Required:	Construction permit (for each well); Project permit (for multiple EOR wells or disposal project).

The Division of Oil and Gas comprises six oil and gas districts. Permit applications on forms OG105, OG107, or OGG107 are submitted to the appropriate district office (CCR 1724.6).

Data and information required to be filed with the appropriate district deputy shall include at least:

a. Engineering study;
b. Geologic study;
c. Injection plan;
d. Copies of letters of notification to offset operators;
e. Other data required for large, unusual or hazardous projects;
f. Maps, diagrams and exhibits.

Note: The above listings are condenseed. Details should be obtained from the appropriate district deputy.

When the project is conditionally accepted, a summary of the application and a transmittal memorandum are sent to the appropriate

Regional Water Quality Control Board (RWQCB) for review and comment.

The Division and RWQCB conduct detailed reviews of all application materials for 14 calendar days. Then the Division either issues a draft permit or a denial of application to the applicant. A copy of the draft permit is sent to the appropriate RWQCB and a notice of receipt of application must be published in a local newspaper of general circulation. Another 15 days are allowed for public comment.

If the Division decides a public hearing is necessary, a notice is published in a local newspaper of general circulation for a hearing date at least 30 days following publication of the notice. If no hearing is required, it normally takes about 45 days from initial application date to be granted a permit.

A project permit is valid for the life of the project or well unless it is modified or revoked for just cause. A permit is rescinded if the project or well has been continuously idle for two years.

Program Description:

All installed safety devices shall be tested at least once every six months (CCR 1724.4).

Mechanical integrity tests should be conducted before an injection well starts operations and once a year thereafter. The appropriate division district deputy shall be notified prior to each MIT so that it may be witnessed or conducted by the state.

Monthly monitoring reports of injection pressures and fluid volumes shall be reported on form OG110B mailed to the local division office Electronic Data Processing Unit within 30 days following the end of each calendar month. Computerized operators may use magnetic tape or diskettes.

All injection wells shall be monitored to ensure that the injected fluid is confined to the intended zone(s). Except for steam and air injection wells, sufficient surveys shall be filed with the division

within three months after injection has begun and once a year thereafter, or after any significant anomalous rate or pressure change, or as requested by the division. The appropriate district office shall be notified before each survey, so it may be witnessed by a division inspector.

The Division allows an operator up to 60 days to repair leaks and spills, which must be reported to the appropriate deputy and the Office of Emergency Services as soon as possible after discovery. If there is possible damage to a USDW, the injection well shall be shut-in within 24 hours.

Enforcement:

A condition of serious noncompliance exists whenever a leak or spill occurs and a USDW is affected or may be affected. If a well is operated or shut-in in any unauthorized manner, or if any enforcement action is violated, or if any false information is given, a condition of serious noncompliance exists.

The District Deputy may terminate a permit if an operator does not bring a well into a condition of compliance or shuts it in within 24 hours if told to do so. For other conditions of noncompliance he may terminate the permit, disconnect the injection line at the wellhead and can initiate civil and/or criminal proceedings.

A person who willfully violates CCR can be fined up to $1,000 for each violation, or by imprisonment not exceeding six months, or both.

Other Considerations:

There are six oil and gas districts in California which have control of underground injection activity. The following map illustrates district boundaries, district office locations, and provides addresses and office telephone numbers.

Minor differences exist among the districts in how the California Code of Regulations are administered. Operators and owners need to communicate with the appropriate district office for working details.

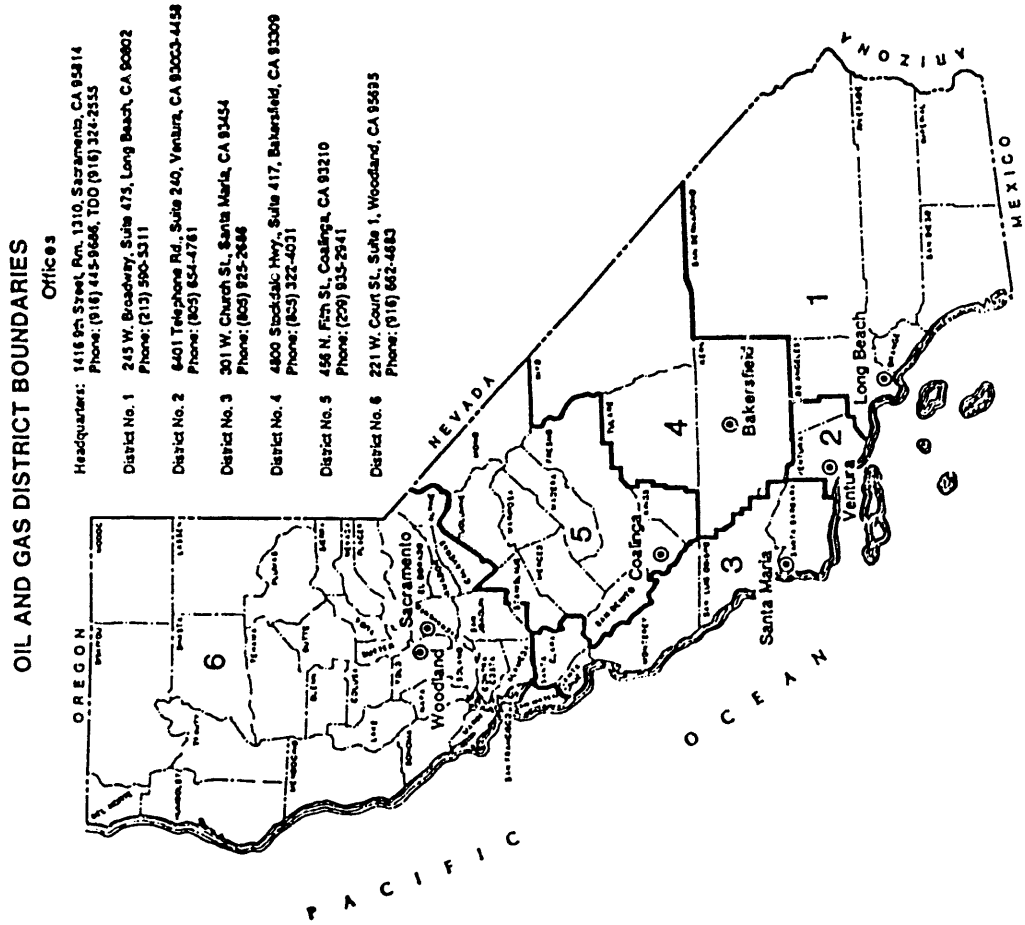

OIL AND GAS DISTRICT BOUNDARIES
Offices
Headquarters: 1416 9th Street, Rm. 1310, Sacramento, CA 95814
Phone: (916) 445-9686, TDD (916) 324-2555
District No. 1 245 W. Broadway, Suite 475, Long Beach, CA 90802
Phone: (213) 590-5311
District No. 2 6401 Telephone Rd., Suite 240, Ventura, CA 93003-4458
Phone: (805) 654-4761
District No. 3 301 W. Church St., Santa Maria, CA 93454
Phone: (805) 925-2446
District No. 4 4800 Stockdale Hwy., Suite 417, Bakersfield, CA 93309
Phone: (805) 322-4031
District No. 5 456 N. Fifth St., Coalinga, CA 93210
Phone: (209) 935-2941
District No. 6 221 W. Court St., Suite 1, Woodland, CA 95695
Phone: (916) 662-4863
OREGON
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
Sacramento
Woodland
Coalinga
Bakersfield
Santa Maria
Ventura
Long Beach
1
2
3
4
5
6

FIGURE NO. 4

CALIFORNIA

HAZARDOUS WASTE

Agency in Charge:	Department of Health Services Toxic Substances Control Division 400 P Street Sacramento, California 95814 916/324-7193
Key Laws or Regulations:	California Health and Safety Code, Chapters 6.5 through 6.98, Division 20; California Code of Regulations, Chapter 30, Division 4, Title 22.
Permits Required:	Operating permit.

Under AB2948 the state formed guidelines for local control over the handling and transportation of hazardous wastes. They created four COGs (Council of Governments - regions to receive funding for regional plan development). The guidelines also provided local control concerning land use by creating County Hazardous Waste Management Plans (CHWMPs).

Guidelines provided by the state are advisory. The promulgation of regulations and enforcement within those guidelines is the responsibility of COGs and CHWMPs.

Regulations in all four regions are being expanded to comply with EPA requirements for the use of BACT, and will be effective January 1, 1992.

Although 40 CFR Rule 261.4 states that drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas are materials which are not considered to be hazardous, they can be listed as hazardous in California. As such, an operating permit may be

required for drilling mud pits and discharge pits or sumps containing a mixture of oil and water.

An application for an operating pit shall be filed at the appropriate region office. These permits are granted for complete facilities; not each well. Depending on the completeness of the application information, it normally takes six months from filing date to the date an applicant receives the permit.

The operating permit is valid for the life of the facility, subject to suspension, modification or revocation for cause.

Program Description:

Operators shall monitor for leaks and seepage. They maintain records of test results, analyses or other determinations for a period of at least three years from the date of each test. They shall file an annual report with the appropriate region office summarizing test results and any incidents during the year.

Operators shall orally notify the appropriate region office as soon as possible, but within 24 hours after discovery of any spill or other condition of noncompliance, to be followed within five days by a written report explaining what happened and what was done, or is planned, to correct the condition.

Enforcement:

An operator found to be in noncompliance is notified by the appropriate region office, and is usually allowed up to 30 days to get back in to compliance.

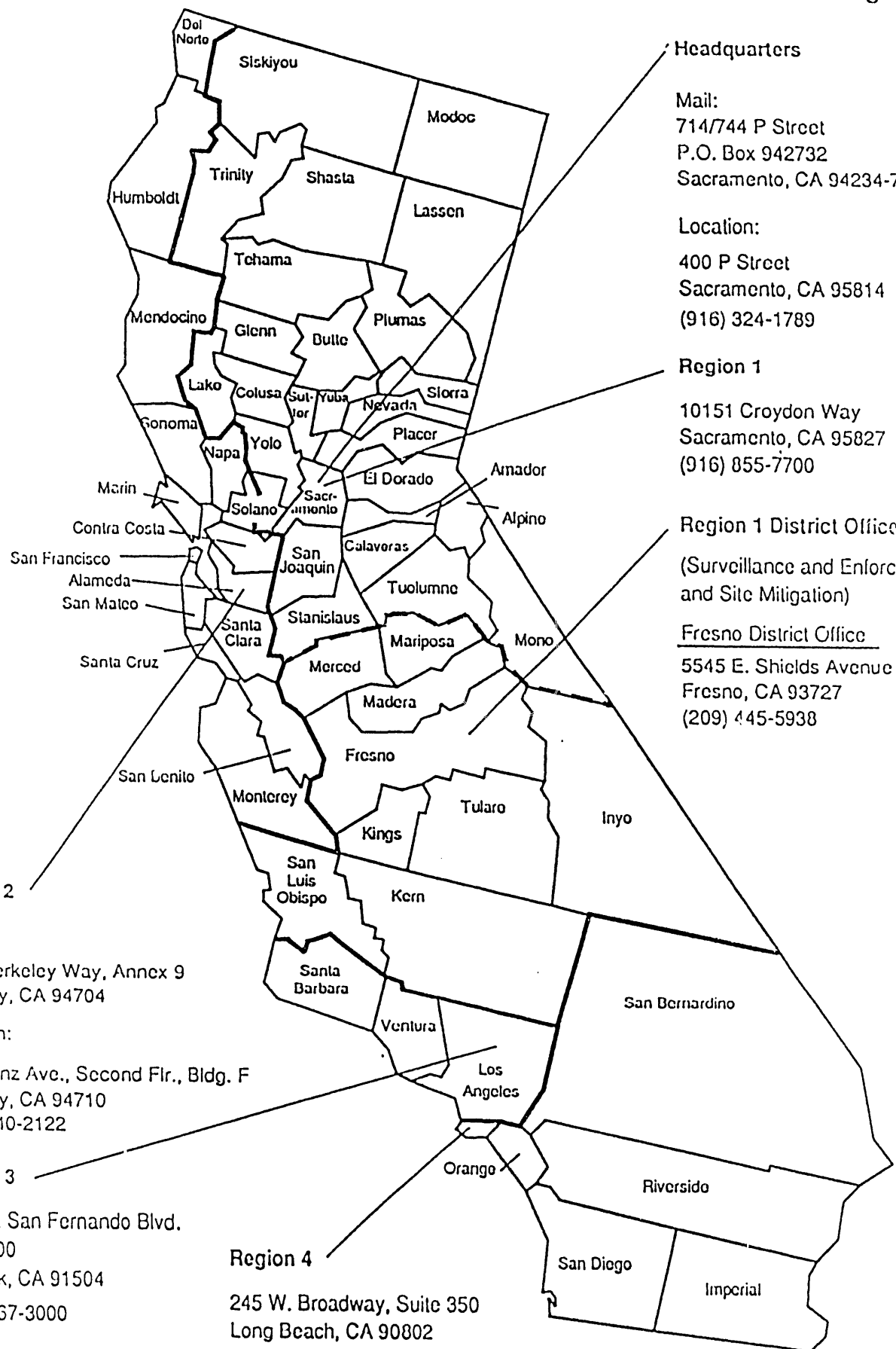
Failure to comply could result in a shutdown of the facility or $25,000 per day per violation.

Other Considerations:

For specific information regarding permitting application requirements and procedures, contact the appropriate region office.

Region 1:	Sacramento	916/855-7700
Region 2:	Berkeley	415/540-2122
Region 3:	Burbank	818/567-3000
Region 4:	Long Beach	213/590-4868

California - Department of Health Services - Toxic Substances Control Program



Headquarters

Mail:
714/744 P Street
P.O. Box 942732
Sacramento, CA 94234-7320

Location:
400 P Street
Sacramento, CA 95814
(916) 324-1789

Region 1

10151 Croydon Way
Sacramento, CA 95827
(916) 855-7700

Region 1 District Office

(Surveillance and Enforcement and Site Mitigation)

Fresno District Office

5545 E. Shields Avenue
Fresno, CA 93727
(209) 445-5938

Region 2

Mail:

2151 Berkeley Way, Annex 9
Berkeley, CA 94704

Location:

700 Heinz Ave., Second Flr., Bldg. F
Berkeley, CA 94710
(415) 540-2122

Region 3

1405 N. San Fernando Blvd.
Suite 300
Burbank, CA 91504
(818) 567-3000

Region 4

245 W. Broadway, Suite 350
Long Beach, CA 90802
(213) 590-4868

FIGURE NO. 5

COLORADO

AIR POLLUTION

Agency in Charge:

Air Pollution Control Division
Air Quality Control Commission
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220
303/331-8500

Key Laws or Regulations:

Colorado Air Quality Control Act, Section 25;
Colorado Air Pollution Control Regulation No. 3.

Permits Required:

Emission permit.

Sources having uncontrolled emissions of any pollutant less than one ton per year, fuel burning equipment using natural gas containing no H_2S except in trace amounts and stationary internal combustion engines with less than five tons per year of emissions or rated horsepower less than five tons per year of emissions or rated horsepower less than 50 are exempt from permit requirements. However, under a few circumstances the above sources may be required to get a permit. Even though an owner or EOR operator plans to use fuel burning equipment small enough not to require a permit, he should notify the Division before proceeding with any construction plans in case an APEN or a permit is required.

An application for an Emission Permit shall be prepared on forms provided by the Division. Within 20 days after receiving an application the Division will notify the applicant if more information is needed.

Within 60 days after receipt of a complete application the Division shall prepare its preliminary analysis. When public comment is warranted, the Division shall, within 15 days after preparation of the preliminary analysis, cause public notice of the application to be published in a newspaper of general circulation in the area where the facility is or will be located, one copy of the preliminary analysis and application to be filed with the local county clerk and commissions of the county in which the facility will be located. The applicant shall be informed of his right to a formal hearing at the same time.

A hearing request to the Division is forwarded by the Division to the Commission within 20 days after its receipt along with the complete permit application, the preliminary analysis and any comments received within five days after the end of the 30 day comment period. The Commission will hold a hearing within 60 days after its receipt of a hearing request from the Division. The final decision of the construction phase will be made within 30 days after the hearing.

Within 15 days after a final decision was made on an application, the Division shall publish the decision where the pre-construction information was made available.

An initially approved permit shall expire if construction or modification does not commence within 18 months after date of issuance or the date it was scheduled to commence in the permit, or if construction is discontinued for 18 months after it was started. However, the Division may extend the time limit if the permittee can show good cause.

Before final approval of the permit is granted, the Division may require the applicant to conduct performance tests in accordance with methods approved by the Division, or may conduct its own performance tests.

An emission permit is valid for the life of the emission source unless it is revoked for cause, or is modified or terminated.

Program Description:

The operator of any air contaminant source shall conduct performance tests and furnish the Division with written reports of the results whenever the Division requests the tests (Common Provisions Regulations II.C.).

The operator of a facility required to install monitoring equipment shall submit to the Division within 30 days following the end of each calendar quarter, a report of excess emissions for all pollutants monitored that quarter (Ref.: Reg. No. 1, IV.G.), and a life of all collected data shall be maintained for at least two (2) years after each collection.

No operator shall cause to be emitted to the atmosphere, particulate matter in excess of 0.6 lbs. per million Btu heat input from any fuel burning equipment of less than or equal to one million Btu/hour total heat input.

No operator shall allow or cause the emission into the atmosphere of any air pollutant which is in excess of 20% opacity.

Oil fired sources are limited to a maximum 0.8 lbs. sulfur emissions per million Btu heat input.

H_2S emissions shall not exceed 0.1 ppm.

Upset conditions shall not be deemed to be in violation of these regulations provided the Division is notified as soon as possible, but no later than two (2) hours after the start of the next working day.

COLORADO

WATER POLLUTION

Agency in Charge:

Water Quality Control Division
Water Quality Control Commission
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220
303/331-4530

Key Laws or Regulations:

Regulations for the State Discharge Permit System; Colorado Water Quality Control Act as amended, esp. Sections 25-8-501 through 505, C.R.S.

Permits Required:

CDPS permit.

An applicant for a permit shall complete an application form issued by the Division, and will file the application at least 180 days prior to discharge. The application shall at least completely describe the facility, ownership, address, telephone contact, general legal description; provide a map and site diagram of the facility, discharge location(s); identify the type of discharge. The Division may require additional information, so encourages applicants to talk with them first (Section 6.5.O.; 6.6.1).

The Division shall advise an applicant within 45 days if more information is needed. If more information is required, 15 more days are added to the 180 day original time schedule (Section 6.6.1).

Following analysis, the Division shall either prepare a draft permit or a proposed denial. The applicant shall be notified, and a copy will be made available to the public. A 30 day period is

allowed for written comments and requests for a public meeting. If the Division grants a request for a public meeting, it shall conduct the meeting within 60 days after the initial public notice (Section 6.6.2- 6.6.4).

After the close of public comments, including any hearing, the Division shall issue or deny the permit. Any permit issued shall become effective 30 days after it is issued by the Division.

The duration of a permit shall be for a fixed term and shall not exceed five years.

Program Description:

Conditions set forth in permits will be in furtherance of C.R.S. 25-8-102 and Federal requirements (Section 6.9.3).

Any discharge authorized by a CDPS permit may be subject to such monitoring, record keeping and reporting as may be required by the Division, including the installation and maintenance of monitoring equipment or methods.

To assure compliance with permit limitations, at least the following shall be monitored by the operator: the mass for each pollutant and volume of effluent discharged. Records of monitoring activities and results shall be retained at least three years (Section 6.9.4).

An excessive discharge or upset shall be reported by the operator to the Division immediately upon discovery, no less than 24 hours. A written report shall be provided within five days, which shall describe the incident, its cause, the period of noncompliance, corrective measures taken to reduce, eliminate and prevent reoccurrence of the noncompliance [Section 6.9.3 (6) (b)].

Enforcement:

Any violation of an effluent limitation, compliance schedule item, or other term of the CDPS permit, or any discharge to state waters not authorized by a CDPS permit, may be subject to any enforcement action which may include the imposition of a civil penalty of up to $10,000 per day of violation.

Any willful violation of a permit, including, but not limited to, the falsification of discharge monitoring reports (DMRs) required by the permit, may be subject to a criminal enforcement action punishable by a fine and/or imprisonment.

COLORADO

UNDERGROUND INJECTION CONTROL

Agency in Charge: Oil and Gas Conservation Commission
Colorado Department of Natural Resources
1580 Logan Street, Suite 380
Denver, Colorado 80203
303/894-2100

Key Laws or Regulations: Oil and Gas Conservation Act.

Permits Required: UIC permit.

Persons desiring to obtain authorization for underground disposal of water or any other fluids into Class II well, or any other well controlled by the Commission, shall file an application with the Director.

The application shall include:

a. Description of the facility, fluids to be injected, the formation into which fluid is to be injected;
b. Plat of the area showing all wells within 1/4 mile of the proposed disposal or injection well and gas wells within 1/2 mile of the site;
c. List of names, addresses, holdings of all surface and mineral owners within the area of the map, domestic and irrigation wells within 1/4 mile from the site, including their location and depth.
d. A copy of all plans and specifications for the system, resistivity logs, remedial work to be done, and a description of the casing including a schematic drawing of all well components.
e. All other information that may be required under Rule 326 and/or 327 and the Director.

Prior to application approval, the proposed injection well must satisfactorily pass a mechanical integrity test. The operator shall notify the director in writing not less than 10 days before the scheduled date on which the test will be performed (Rule 327.g.).

Permits are issued for the project first, then for each well in the project. Injection wells can be placed anywhere within 1/4 mile of the unit boundary and 1/2 mile from neighboring producers' wells.

The Commission will publish notice upon the filing of any application. The operator of a proposed injection well shall mail a copy of the application to each owner of the reservoir within 1/4 mile of the site on or before the filing date, and shall include an affidavit of those mailings with his application.

Written public comments are received up to 15 days following application filing date, which may be followed by a public hearing called by the Director if he determines it is appropriate. Normally, no more than 45 days lapse between filing date and permit approval date.

Permits are valid for the life of the project unless revoked for cause or the operator terminates the project or plugs an injection well.

Program Description:

Operators are required to monitor fluid injection rates and volumes, and to file monthly monitoring reports with the Commission after the initial mechanical integrity test. Wells are inspected annually by the state. Additional mechanical integrity tests are done at the rate of at least once every five years on each well as long as it is used for the injection of fluids.

Upsets or fluids blowing uncontrolled from a well shall be brought under control as soon as possible, and the operator shall report such occurrences to the Director immediately if public health or safety is jeopardized. Within 15 days after all

occurrences the operator shall submit a written report giving all details.

If an operator is late in filing a monthly monitoring report or is apparently violating any rule, the Director shall notify the operator to come into compliance within 30 days. If the operator is causing pollution, he must file a plan to prevent future pollution within 30 days after the incident or after notification from the Director.

Enforcement:

Noncompliance with regulations shall be cause for the Commission to immediately conduct a hearing. In the event an owner or operator fails to comply with a Commission order, the Commission may cause a well to be shut down or plugged. The owner or operator can also be assessed a fine not exceeding $1,000 per day per violation, and each day of noncompliance is a separate violation.

COLORADO

HAZARDOUS WASTE

Agency in Charge:

Waste Management Division
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220
303/331-4830

Key Laws or Regulations: Colordo Regulation 6CCR.1007-3; 40 CFR, Parts 260 thru 271.

Permits Required: For disposal sites only.

Colorado's Regulation 6CCR.1007-3 replaced CFR rules. The state was granted primacy in 1984, to issue permits under its jurisdiction.

Under 6CCR.1007-3; "Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy," are materials which are not considered to be hazardous wastes.

No hazardous waste permit may be required for drilling mud pits and/or wastewater discharge pits. However, many drilling mud chemicals are considered to be hazardous, and their storage and disposal come under the aegis of Colorado regulations. They are also within RCRA rules.

No compliance is required under Colorado regulations unless there is a spill and classified material is involved.

ILLINOIS

AIR POLLUTION

Agency in Charge:	Division of Air Pollution Control Illinois Environmental Protection Agency 2200 Churchill Road Springfield, IL 62706 217/782-7326
Key Laws or Regulations:	Air Pollution Control Regulations, Rule 103; Environmental Protection Act.
Permits Required:	Construction permit and operating permit.

Applicant for a construction permit must use an application form (APC-200) provided by the state. The location and description of the proposed facility shall include a description for each emission source and each item of pollution control equipment.

The Division will require the following data sheets to be attached to the application form, including a plot plan; process flow diagram; map showing the location of the proposed facility locations of surrounding wells, community structures; plus any additional data requested by the authority.

EOR facilities discharging 50 tons or more per year of pollution to the atmosphere will be required to conduct an ambient air quality analysis in the area when applying for a permit, and will submit the results with the application.

An operating permit application is made for each emission source after it has been constructed and tested to demonstrate compliance with:

a) Emission limitations;
b) Construction in accordance with the construction permit;

c) Minimumization of start-up emissions;
d) Any necessary compliance schedules and emergency episode procedures.

The operating permit is valid for five years unless it is modified, suspended or terminated by the Division for cause. Renewals must be applied for at least 90 days in advance.

Program Description:

Visible emissions of particulate matter shall not exceed 20% reduction of air opacity over a six (6) minute period.

No operator shall cause to be discharged to the atmosphere emissions in excess of:

SO_2: 0.6 lb/million Btu heat input.

NO_2: 0.5 lb/million Btu heat input.

EOR operators shall monitor emissions at least once a month or at intervals specified by the Division, shall submit annual reports for each source, and shall maintain records for at least five years.

Excess emissions shall be reported to the Division as soon as possible, in no case more than 24 hours after discovery. Immediate steps will be taken to mitigate or stop the emissions, and a written report shall be filed with the Division within five days.

Failure to comply is cause for suspension or revocation of the operating permit.

Enforcement:

The maximum penalty for violation of the law or regulations is $10,000 plus $1,000 per day for each violation.

ILLINOIS

WATER POLLUTION

Agency in Charge:

Water Pollution Control Board
Illinois Environmental Protection Agency
2200 Churchill Road, P.O. Box 19276
Springfield, IL 62706
217/782-1696

Key Laws or Regulations:

Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter I. The Illinois Oil and Gas Act, Part 240, Subpart I.

Permits Required:

The Illinois Environmental Protection Agency was delegated NPDES authority; but no surface water discharges from the oil and gas industry are allowed.

Neither an NPDES permit nor a state permit is required for any discharge into a well which is authorized by a UIC permit (Title 35: Admin. Code 702 and 704, Subtitle G).

A state permit is required for any pits. Application should be made to the Oil and Gas Division, Illinois Department of Mines and Minerals, which will rule on the application within 10 days.

Oil and Gas Division
Illinois Department of Mines and Minerals
300 West Jefferson, Suite 300
Springfield, IL 62706
217/782-7756

Note: If any pits are to be used, they must be lined with an impermeable material to prevent seepage.

Application for the required construction permit shall be made on a form provided by the Mining Board (Section 240.920).

No other permit is required.

Program Description:

All pits shall be subject to annual inspection by the Mining Board to determine pit wall integrity, adequacy and compliance with Board regulations.

When salt water or other waste liquid is not properly impounded, or properly disposed of, or is a water pollution hazard, or is injurious in any way, the Mining Board will order such condition to be corrected by the operator within a specified period of time (no less than 10 days nor more than 90 days) – Ref. Section 240.970.

Enforcement:

The Mining Board may condemn any pit which does not properly impound permitted liquids, including revocation of the permit and ordering the operator to dispose of such liquids and waste by other means.

Criminal charges may be brought if a violation continues and/or threatens public health.

ILLINOIS

UNDERGROUND INJECTION CONTROL

Agency in Charge:

Oil and Gas Division
Illinois Department of Mines and Minerals
300 West Jefferson, Suite 300
Springfield, IL 62706
217/782-7756

Key Laws or Regulations:

The Illinois Oil and Gas Act, Part 240, Subparts B and F.

Permits Required:

UIC permit.

An enhanced oil recovery project shall be permitted only by permit from the Oil and Gas Division after notice and hearing. The operator requesting approval must provide any data to the Division that it requires for proper evaluation of the project.

The applicant shall use an application form designed by the Division and will attach other data sheets as required (Section 240.255, 240.260, 240.270). A similar form is used when applying for approval of EOR projects and for EOR injection and disposal wells. However, the volume of support data required for injection and disposal well approvals is more stringent.

Applicant shall also cause notification that an application has been filed to be published in a general circulation newspaper in the county in which the injection or disposal well is located. He shall file proof of publication with the Division prior to the hearing or administrative approval [Section 240.270 (c)]. A copy of the notice shall be mailed to the owner of the land surface on which the well is to be located and to each operator of a producing leasehold within 1/2 mile of the site.

If no objection has been filed within 15 days after publication of the notice, and if the Mining Board and/or the Division does not require a hearing, the permit shall be issued [Section 240.270 (d)].

UIC permits are valid for the life of the wells unless revoked by the Division for just cause. A permit may be modified, revoked and reissued or terminated by written request from any interested party, or at the Division's initiative, if;

1) There is a substantial change of conditions in the well operations or there are substantial changes in the originally furnished information.

2) Information indicates the operation's cumulative effects on the environment are unacceptable (Section 240.280).

Program Description:

Upon completion of a well for which a permit was issued, the operator shall promptly mail a completion card to the Mining Board and a duplicate to the Oil and Gas Division.

Each EOR injection or disposal well shall be equipped, operated and maintained in a manner that will prevent pollution of fresh water or damage to sources of oil and gas (Section 240.650).

The operator shall notify the Division of any changes in a project, shall maintain performance data, and shall cease injection if there is evidence of damage.

If the Division of Oil and Gas orders tests or remedial work that in its judgement are necessary to protect underground water, the operator must begin the work within 30 days.

The operator of a Class II injection well shall notify the local well inspector at least 24 hours prior to setting or resetting of any packer. He shall notify the inspector and schedule an internal mechanical integrity test before commencing injection. The test will be done under the supervision of the well inspector (Section 240.655). Mechanical integrity tests shall be done on each Class II injection well at least once every five

years or whenever the Division has reason to believe a well may be leaking or is improperly constructed.

An external mechanical integrity test shall be done on any newly drilled Class II injection well, in any production well converted to a Class II injection well (Section 240.655).

Enforcement:

Whenever an inspector or other authorized Oil and Gas Division employee determines that an EOR operator is violating any requirements of the Oil and Gas Act or any permit condition, a notice of violation shall be delivered to the Director of the Division, one copy of which will be mailed to the permittee. The permittee shall respond, in writing, within 14 days of the mailing of the notice of violation (Section 240.150).

The Director shall conduct an investigation to affirm, modify or vacate the notice of violation. He may order remedial steps as necessary, modify the permit, place the permittee on probation, assess civil penalties not to exceed $1,000 per day for each violation or revoke the permit, or any combination of the above (Section 240.160).

ILLINOIS

HAZARDOUS WASTE

Agency in Charge:

Oil and Gas Division
Illinois Department of Mines and Minerals
300 West Jefferson, Suite 300
Springfield, IL 62706
217/782-7756

Key Laws or Regulations:

Illinois Oil and Gas Act, Part 240, Subparts I.

Note: Refer to the Illinois WATER POLLUTION section of this compendium. Regulations governing pits and other surface waste storage/disposal facilities are applicable. There are no specific regulations governing the disposal of solid or hazardous waste materials.

KANSAS

AIR POLLUTION

Agency in Charge:

Bureau of Air and Waste Management
Kansas Dept. of Health and Environment
Forbes Field
Topeka, KS 66620-0002
913/296-1570

Key Laws or Regulations:

Kansas Ambient Air Quality Statutes and Regulations: Sections 65-3008; 65-3011; 65-3018; 28-19-7; et seq.

Permits Required:

Kansas Administrative Regulations (KAR) require an operator to report any activity when potential emissions equal or exceed limits specified by the Kansas Department of Health and Environment (KDHE). Air pollution sources having potential contaminated emission rates above that specified shall obtain a permit from the KDHE at least 90 days before initiating the activity [KAR Sec 28-19-8; 28-19-4; and KSA 65-3008].

Applications shall be made on forms provided by the KDHE for each source [KAR 28-19-8(a)]. It may take up to 180 days to receive a permit after the completed application date.

Construction permits become invalid if construction is not commenced within 18 months after receipt of approval or if construction is discontinued for 18 months or more unless the deadlines are granted extensions.

Operating permits are renewed annually by April 1 following the year in which construction was completed. They may include one or more emission sources located within a facility. [KAR 28-19-14 (g); 28-19-14b (d)]

Program Description:

Visible emissions of particulate matter shall not exceed 20% opacity from sources not existing on or after January 1, 1971 [KAR 28-19-50].

Each major source shall be considered to cause or contribute to a violation of a national ambient air quality standard when the air quality impact of the area exceeds the following significance levels [KAR 28-19-17b (h)]:

	Averaging Time				
Pollutant	Annual	24	8	3	1
Particulates	1.0$\mu g/m^3$	5$\mu g/m^3$	--	--	--
SO_2	1.0$\mu g/m^3$	5$\mu g/m^3$	--	25$\mu g/m^3$	--
NO_x	1.0$\mu g/m^3$	--	--	--	--
CO	--	--	0.5mg/m^3	--	2mg/m^3

Note: mg/m^3 = Milligram/cubic meter
$\mu g/m^3$ = Microgram/cubic meters

All excess emissions shall be reported to the Department as soon as possible, not later than 24 hours after the release, followed by a written report within 30 days.

The Department may require the owner or operator to install a continuous emission monitoring system (CEMS) or systems on specified emission units [KAR 28-19-19].

Emissions shall be monitored during all phases of source operations, records maintained by type, quality, volume, etc., and the operator shall maintain a file of all measurements for at least two years, in a suitable form for inspection by KDHE. or U.S. EPA representative [KAR 28-19-19 (h)].

Whenever an operator has been notified that he is in a condition of noncompliance with Kansas Ambient Air Quality Statutes and Regulations, he has up to 15 days to request a hearing. After the hearing or if none is requested, and if a violation has been confirmed, the Department will direct the operator to take corrective action to be completed by a prescribed date [KAS 65-3011].

Enforcement:	Persons who violate any order issued, or any rule or regulation, shall be subject to a fine of up to $1,000. Each day such an order is violated shall constitute a separate offense [KAS 65-3018].
Other Considerations:	The Federal Clean Air Act amendments of 1990 will cause changes to be enacted in the Kansas Ambient Air Quality Statutes and Regulations beginning after November, 1992.

KANSAS

WATER POLLUTION

Agency in Charge:

Conservation Division
Kansas Corporation Commission
200 Colorado Building, 202 West 1st Street
Wichita, KS 67202-1286
316/263-3238

Key Laws or Regulations:

Kansas Statutes Annotated 55-152, Chapter 201, Sec 9; KSA 55-162, 55-164, 55-172, 74-623; Kansas Administrative Regulations 82-3-600 et seq.

Permits Required:

Surface Pond Permit.

Applications for surface pond permits, for mud pits and other surface ponds, shall be permitted only upon application and approval by the KCC. Applications shall be made on forms furnished by the Commission.

Each application shall show:

1) Lease name and legal description, pond location, and number of producing wells on the lease;
2) Name(s) of the producing formation(s) of the wells on the lease;
3) Construction of the surface pond;
4) Applicant's license number;
5) Any other information the Commission may require.

Surface pond permits shall be considered granted unless denied within ten (10) days after receipt of the application. They are valid for the life of the pond or pit activity unless revoked by the Commission.

Program Description:

All surface ponds, except drilling pits and burn pits shall be constructed with a minimum 30 inches of freeboard. The freeboard of drilling pits and burn pits shall be no less than 12 inches.

Each operator of a surface pond shall install observation trenches, holes, or wells if required by the Commission, shall seal the pond and prevent surface drainage from entering the pond.

Upon the permanent cessation fluid flow into any surface pond, or upon the revocation of a permit, the operator shall remove the contents to a disposal well or other approved disposal method, and shall grade the surface of the soil as soon as practical or as required by the Commission (KAR 82-3-602).

Each operator shall notify the appropriate district office within 24 hours of the discovery of a spill which is not confined in a surface pond. If the spill has reached flowing water, the operator shall notify the appropriate district office immediately (KAR 82-3-603). The operator shall clean up a spill using an approved method, at it shall be completed within (10) days after notification or within a time period prescribed by the district office.

Enforcement:

Failure to clean up a spill in a timely manner shall be punishable by a $1,000 fine for the first violation, $2,500 fine for the second violation, $5,000 penalty for the third violation plus a review of the operator's license.

Each operator of an emergency pit shall remove fluid from the pit within 48 hours after the discovery of the discharge. Failure to remove fluids in a timely manner shall be punishable by a $250 penalty for the first violation, $500 for the second violation, and $1000 and operator license review for the third violation.

KANSAS

UNDERGROUND INJECTION CONTROL

Agency in Charge:

Conservation Division
Kansas Corporation Commission
200 Colorado Building, 202 West 1st Street
Wichita, KS 67202-1286
316/263-3238

Key Laws or Regulations:

K.A.R. 82-3-400 thru 82-3-410; K.S.A. 1989 Suppl. 55-151, 55-152, 55-156, 55-157, 55-164, 55-172, 55-901, 55-904, 55-1003.

Permits Required:

UIC permit.

EOR injection or disposal wells must be permitted before they can be constructed. Applications shall be filed for each well, and shall be filed on forms prescribed and furnished by the Commission. Ref K.A.R. 82-3-400, 82-3-401.

Permits are valid for the life of the well unless revoked by the Commission for just cause or the well is abandoned by the operator. Amendments of any injection or disposal well may be made only by application for approval by the Commission [K.A.R. 82-3-406].

Properly completed applications accepted for consideration by the Commission normally will receive approval within 90 days of receipt.

Program Description:

Fluid shall not be injected into any EOR disposal well until approved by the Commission. Immediately upon commencement of injection or disposal operations the operator shall notify the conservation division of the commencement date. Within 90 days after permanent discontinuous of injection or disposal operations, the operator shall notify the conservation division of the date of discontinuance and the reasons for it, and shall follow KAR 82-3-111 for

plugging and abandonment of the well [KAR 82-3-401, 82-3-403].

The EOR operator of each injection or disposal well shall keep a current and accurate record to be preserved for five years of the amount and kind of fluid injected into the well, and shall submit a report to the Commission on or before March 1 of every year. [K.A.R. 82-3-400 (e)].

Each injection or disposal well shall be completed, equipped, operated and maintained that will prevent pollution of fresh and usable water. Once a month the EOR operator shall monitor and record well pressure, fluid level and any other necessary measurements. Monitoring shall include mechanical integrity tests. An annual report shall be made to the Commission [KAR 82-3-405, 82-3-407].

Enforcement:

Failure to obtain approval before beginning injection or disposal operations shall be punishable by a $1,000 penalty to first time violators; $5,000 for second offense; $10,000 and possible loss of permit for third offense [K.A.R. 82-3-400 (g)].

Failure to notify the Commission of a well's permanent discontinuance of operations within 90 days will be punishable by a $100 penalty [K.A.R. 82-3-403 (c)].

In addition to any other penalty provided by law, the Commission may impose a penalty not exceeding $10,000. Every date such violation continues shall be deemed a separate violation [K.A.S. 1989 Suppl. 55-164].

KANSAS

HAZARDOUS WASTE

Agency in Charge:	Bureau of Air and Waste Management Kansas Dept. of Health and Environment Forbes Field, Building 740 Topeka, KS 66620-7202 913/296-1600
Key Laws or Regulations:	Hazardous Waste Management Act, K.S.A. 1990, Chapter 65, Article 34.
Permits Required:	Hazardous waste shall not include: ----drilling fluids, produced waters and other wastes associated with the exploration, development and production of crude oil, natural gas or geothermal energy [K.S.A. 65-3430 (f)]. Permits for hazardous waste treatment, storage and disposal facilities shall be issued for fixed terms not to exceed 10 years. Up to 240 days for completeness may lapse from receipt of the application to final approval date [K.S.A. 65-3439 and 65-3438].
Program Description:	If hazardous waste is stored, treated, or disposed of on site, a hazardous waste facility permit is required. The permit application must meet the requirements contained in 40 CFR Part 270. Permit application and monitoring fees are required for hazardous waste treatment, storage or disposal (T/S/D) facilities. Permits for hazardous T/S/D waste facilities shall be issued for a fixed term not to exceed ten (10) years. Once a permit application is deemed complete for a storage or treatment facility, a final decision to issue or deny the permit must be made within 240 days. Underground burial of hazardous waste is prohibited. (No below ground hazardous waste landfills.) K.S.A. 65-3458

LOUISIANA

AIR POLLUTION

Agency in Charge:

Air Quality Division
Louisiana Department of Environmental Quality
P.O. Box 82135, 7290 Bluebonnet Blvd.
Baton Rouge, Louisiana 70884-2135
504/765-0219

Key Laws or Regulations:

Louisiana Administrative Code, Vol. 11, Title 33, Chapter 5, Louisiana Air Control Law R.S. 30:2051-2060.

Permits Required:

Pre-construction (also is used for operating) permit.

Any person planning to initiate or increase the emission of air contaminants shall first advise the Division of his intention, and shall apply for a permit request form. He shall provide on the form: a description of the facility, the steps being taken to protect the air against new pollution, plans, specifications and any other information the Division requires (LAC 33:III.505).

The Division may exempt a facility if it is found that the facility will not make a significant contribution of contaminants to the atmosphere. The Division may also issue a certificate of approval for that circumstance, i.e. air quality impacts are less than

CO_2: 575$\mu g/m^3$, 8-hour avg.
NO_2: 14 $\mu g/m^3$, annual avg.
PM_{10}: 10 $\mu g/m^3$, 24-hour avg.
SO_2: 13 $\mu g/m^3$, 24-hour avg.

A pre-application air analysis shall be conducted and included in any application for a permit. After construction or major modification of an emission source the owner or operator shall conduct such ambient air monitoring as the Division determines is necessary. The installation and operation of monitoring stations must be approved by the Division.

The owner or operator shall provide an analysis of impairment to visibility, soils and vegetation that would occur as a result of the source or modification (LAC 33:III.509.0).

In addition, the owner or operator of each proposed new or modified source must demonstrate that all major stationary sources owned or controlled by that person in Louisiana are in compliance with all emission standards under the Federal Clean Air Act.

Notification of the application shall be published in at least one location in the affected Air Quality Control Region. It shall be a prominent advertisement, and a copy of it shall be sent to the U.S. Environmental Protection Agency. A 30-day period exists for public comment.

An owner or operator who has been issued a Federal PSD permit must also obtain a state permit if the source fails to comply with the terms and conditions of the Federal permit (LAC 33.III.509.A).

The Division shall notify the applicant within 60 days after receipt of the application as to whether it is complete or deficient. After the Division is satisfied that the application is complete, it shall within one year make a preliminary decision whether construction should be approved or denied and make available to the public a copy of the preliminary determination as specified in LAC 33:III.509.Q.

A period of 30 days after publication date is allowed for public comment, and at any time during that period hold a public hearing.

Within one year after receipt of a complete application the administrative authority shall make a final determination whether construction shall be approved or denied, and shall notify the applicant in writing.

A permit shall become invalid if construction is not commenced within 18 months after issuance, or if construction is discontinued for a period of 18 months or more; but the latter may be extended by the Division if an extension is justified.

One permit may be issued for a facility having more than one emission source. However, each source must be identified in the permit.

Program Description:

The contribution of any contaminant by any source shall be measured as the difference between the upwind level and the downwind level for the property.

The administrative authority may exempt certain facilities from permitting if it is found that the facility will not make a significant contribution of air contaminants to the atmosphere, i.e.: less than one ton per year of any single pollutant.

Operators shall install, calibrate, operate and maintain all monitoring equipment necessary for continuously monitoring pollutant emissions.

All emissions of air contaminants shall be reported except carbon dioxide, water vapor, air and nitrogen. An "Emission Inventory Questionnaire" (EIQ) shall be submitted when requested by the Division. Each source or facility shall maintain a current EIQ for all emission points, and shall submit recorded data on machine readable EIS forms by March 1 each year to the Department.

The emission of smoke from any combustion unit shall be controlled so that the shade or appearance of the emission is not darker than 20% average opacity (LAC 33:III.1101).

Emissions of particulate matter from fuel burning equipment shall not exceed 0.6 pounds per 10^6 Btu of heat input (LAC 33.III.1313).

SO_2: Not more than 2000 ppm by volume at standard conditions (LAC 33:III.1503).
NO_2: <10 lbs. within any 24 hour period.

Any unauthorized emission into the air shall be reported by the operator to the Division immediately, but in no case more than 24 hours after discovery, by telephone or other verbal communication method (LAC 33:III. 3917).

Written reports for unauthorized discharge incidents will be submitted to the Division in addition to the verbal notifications. They shall be mailed within seven calendar days after the verbal notification.

Enforcement:

Failure to comply with any of these regulations constitutes a violation of the Louisiana Environmental Quality Act. Each day of failure shall constitute a separate violation.

The Louisiana Air Control Law establishes a four step enforcement process:

1. Conciliation or persuasion;
2. If conciliation or persuasion fails, the Division may file a formal complaint leading to a formal hearing before the Air Control Commission;
3. If the Commission's recommendations fail, it will issue an order;
4. If the order is violated, the Commission may refer the case to the state's Attorney General for court action, which can result in penalties up to $2,000 per day for each offense.

Other Considerations:

Permits are good for the life of the project today, but shortly will have to be renewed every five years.

The Federal Clean Air Act of 1990 will cause major air toxic rules to change by November, 1992.

LOUISIANA

WATER POLLUTION

Agency in Charge:	Louisiana Department of Environmental Quality Office of Water Resources Water Pollution Control Division P.O. Box 82215, 7290 Bluebonnet Blvd. Baton Rouge, LA 70884-2215 504/765-0634
Key Laws or Regulations:	Department of Environmental Quality Louisiana Administrative Effluent Standards; LAC 33:IX.708 and LAC 33:IX.901.
Permits Required:	Louisiana Water Discharge Permit System (LWDPS Permit); NPDES Permit from the Federal EPA. Applications for LWDPS permits shall use forms provided by the Department and shall provide all of the information required by the Department before being considered for processing (LAC 33:IX.303, pp. 124-132). A single application may be filed for multiple discharge sources within a facility, but the discharge from each source shall be described separately. All permits contain effluent limitations requiring control and treatment equivalent to secondary treatment...for nonconventional or toxic pollutants. All LWDPS permits are issued for a period not exceeding five years. Normally, up to three months lapse from acceptance of completed applications to the granting of a permit.

Before granting a permit, the Office of Water Resources will issue a public notice describing the applicant and the facility (LAC 33:IX.315). The applicant shall publish the notice in the official state journal and in any local newspapers specified by the office. From 30 to 60 days are allowed for the public to respond, and the Office may conduct a public hearing.

At the time any final permit is issued, the Office shall issue a response to comments which shall be delivered to any person who commented.

Program Description:

In upland areas, Louisiana generally prohibits the discharge of any waste fluids from oil production activities. However, in wetland areas, an LWDPS permit is required for all production facilities, and certain discharges may be allowed. This permit is required in addition to the NPDES permit that the facility will need from the Federal E.P.A., Region VI, in Dallas, Texas.

The discharge of drill cuttings or drilling fluids, including stormwater runoff, must be conducted in accordance with a valid LWDPS permit (LAC 33:IX.708, eff. 3/20/91).

All impoundments and pits for the containment of wastewater, including drilling fluids, must be surrounded by stable, well maintained levees of sufficient size to prevent a discharge of pollutants into surface waters of the state (LAC 33:IX.705.D).

Discharge of treated wastewater from drilling site reserve pits, production pits that contain only nonhazardous oilfield wastes, are permitted within the maximum tolerance levels specified in valid LWDPS permits:

Oil & Grease	15 mg/L daily max.
Total Suspended Solids	50 mg/L daily max.
Chlorides	500 mg/L daily max.
pH Range	6.0-9.0 standard units at all times.

All produced water discharges must be specifically identified in the LWDPS permit.

Wherever possible, disposition of oilfield brine shall be accomplished by discharge through disposal wells to underground horizons below the fresh water level (LAC 33:IX.1701). Each discharge will require specific prior approval from a WPCD representative.

The preparation and implementation of a "Spill Prevention and Control Plan" is required for any facility meeting the applicability criteria (LAC 33:IX.901).

In the event of an unauthorized discharge of oil, produced water or any other material, the operator shall immediately notify the WPCD in accordance with LAC 33:I.3901 et seq. Simultaneously he shall begin removal of discharged materials. He shall decontaminate to the extent practicable, any water, soil, sediment or vegetation impacted by the discharge.

Enforcement:

Violation of the law will lead to the issuance of violation and/or compliance orders. Violations may be penalized for an amount of up to $25,000 per day, per violation. Unresponsiveness will lead to termination of the permit and/or civil action by the Attorney General. If a criminal violation has been suspected, the Office of Water Resources shall provide the appropriate District Attorney with all facts pertaining to the incident for criminal prosecution.

Other Considerations:

Rules published by the Corps of Engineers allow for general dredge and fill permits.

The necessity for getting local approval of projects remains in effect. Concern for the preservation of wetlands is intense.

LOUISIANA

UNDERGROUND INJECTION CONTROL

Agency in Charge:	Louisiana Department of Natural Resources Office of Conservation Injection and Mining Division P.O. Box 94275 Baton Rouge, Louisiana 70804-9275 504/342-5515
Key Laws or Regulations:	30 L.R.S. Secs. 4C and I; Sec. 129.C of Statewide Order No. 29-B. Forms MD-10-R, MD-10RA, UIC-2 EOR.
Permits Required:	Louisiana Class II UIC permit. Application for the approval of a new well or disposal well shall be filed on Form MD-10-R. The application shall be accompanied by: a map showing the site and location of other wells within 1/4 mile radius; identification of other wells, owners, operators; identification of landowners; surface bodies of water located on the map, plus other pertinent land features; a schematic drawing of the well; analysis of water in vicinity; all other information that may be required (LAC 43:XIX.129C). Applications for saltwater disposal, EOR wells or projects, and other Class II facilities, shall be advertised in the official state journal. The public has 15 days after publication date to file written comments. Notices of a public hearing shall be sent to each interested party. The hearing shall be conducted after the comment period, but within 30 days, after which time the Commissioner may administratively approve or deny the application.

It normally takes eight to 12 weeks to get a permit if all required information is in the application. Permit is valid for the life of the well unless it is revoked for just cause.

An application for approval of an injection well which is a part of a proposed EOR operation may be consolidated with the application for approval of the EOR project.

Program Description:

The operator shall monitor injection pressure and injection rate of each EOR injection well or disposal well on a monthly basis, and shall report the results annually on Form UIC-10. Any casing annulus testing must be reported on Form UIC-10.

The operator shall notify the Commissioner within 30 days of the date when an EOR injection well or disposal well commenced operation. Similarly, he shall notify the Commissioner within 30 days when an EOR injection well or disposal well is permanently terminated.

Any mechanical failure or downhole problem may be cause to shut in a well. If the condition may endanger USDW the operator shall notify the Commissioner within 24 hours at 504/342-5515. Written notice shall be mailed within five days of discovery, along with a plan for testing and/or repairing the well (LAC 43:XIX.129I).

Each EOR injection well and disposal well is inspected by state inspectors at least once every five years, plus sporadic inspections.

Enforcement:

A permit may be revoked or terminated after hearing if: 1) cumulative effects on the environment are unacceptable; 2) there are substantial violations of the permit; 3) the operator lied during the permitting process.

Violations can also be cause for penalties of fines or civil action by the Attorney General. If a criminal violation is suspected, the owner or operator, or both, are subject to prosecution.

LOUISIANA

HAZARDOUS WASTE

Agency in Charge:	Hazardous Waste Division Louisiana Department of Environmental Quality P.O. Box 82178, 7290 Bluebonnet Blvd. Baton Rouge, Louisiana 70884-2178 504/765-0355
Key Laws or Regulations:	Louisiana Administrative Code Vol. 13, Title 33, Chapter 33; LAC Vol. 17, Title 43, Chapter 1; Statewide Order No. 29-B.
Permits Required:	Drilling fluids, produced waters and other wastes associated with exploration, development or production of crude oil or natural gas are exempt from these regulations (LAC 13-33:V.105.D14).
Other Considerations:	These regulations may be changed in the near future to include oil and gas production wastes. They will follow EPA guidelines. Permitting approval is expected to go through the Hazardous Waste Division, and/or the Ground Water Protection Division then passed back to the permitting agency which will be the Water Pollution Control Division. The Water Pollution Control Division recently published a program requiring the phased elimination of unpermitted discharges into state waters of waste water, waste oil, drilling fluids and cuttings, stormwater runoff from oil and gas exploration and production sites. None will be permitted after January 1, 1995. Production pits for the containment of oilfield wastes presently are required to be in compliance with LAC 43, Chapter 1, Statewide Order No. 29-B.

MICHIGAN

AIR POLLUTION

Agency in Charge:	Permit Section, Air Quality Division Michigan Department of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/373-7023
Key Laws or Regulations:	Air Pollution Act, Public Act 348 of 1965, as amended; Michigan Air Pollution Control Commission's Administrative Rules.
Permits Required:	Air Quality Permit to Install; Air Quality Permit to Operate. Applicant submits a signed application form to the Air Quality Division. After reviews by AQD engineers and a period of time for public comment, a decision is made to grant or deny the permit. The construction permit "Permit to Install" normally takes 2 to 4 months for processing after the application is complete. Applicant must apply via letter to the Permit Section Supervisor for a "Permit to Operate". The letter should be sent not more than 30 days after installation or the beginning of trail operation of the process.
Program Description:	Permittee must comply with all rules and stipulations in accordance with the terms of the permit.

Enforcement:	Installation of equipment without an approved Permit to Install or failure to comply with the terms of a permit is a misdemeanor and, upon conviction, subject to a fine of not more than $10,000 and an additional amount of not more than $2,000 per day as violation continues.

MICHIGAN

WATER POLLUTION

Agency in Charge:	Surface Water Quality Division Michigan Department of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/373-8088
Key Laws or Regulations:	Federal Water Pollution Control Act, 33 U.S.C. 1251, et seq.; Michigan Water Resources Act, Public Act 245 of 1929, as amended; Water Resources Commission Rules, Part 4 and Part 21.
Permits Required:	NPDES permit. Application for a permit shall be made to the Permits Section, Surface Water Quality Division (SWQD). A complete description of the proposed facility including pollutants used or stored or produced, expected waste water characteristics shall be included in the application. The SWQD staff reviews the completed application and prepares a draft permit or recommends denial. Draft permits are reviewed by applicant and staff; then public notice is given. If there is sufficient public interest a public hearing may be held. For a major size facility, EPA concurrence must be obtained before a permit can be issued. The Michigan Water Resources Commission is the agency which issues the NPDES permit. The estimated processing time varies from 90-360 days depending on the complexity of the issues. Permits are issued for fixed terms not to exceed five years.

Program Description:

A permit holder must meet specified permit conditions, fulfill monitoring and reporting requirements and meet all other conditions of the permit.

Any facility(s) that are used to store hydrocarbons and/or brine constructed after 11-15-89 or converted after 11-15-89 must have secondary containment.

Each surface secondary containment facility shall have a monitoring device to detect any leakage into surface waters and/or groundwater. Samples shall be taken every six months. Results of the sample analyses are to be sent to the Supervisor, Geological Survey Division.

Storage vessels shall be elevated, or placed on impervious pads, or constructed so that leaks are easily detected. The sidewalls and floor of the secondary containment shall be constructed and sealed to prevent seepage of fluids into surrounding soils and groundwater.

Upon completion of the construction of the secondary containment facility and prior to using it, the operator will certify to the Supervisor that the containment pit was constructed in accordance with the approved plan.

The frequency of inspections by the permittee must be such that the throughput of fluids will not exceed containment capacity between inspections; no less than one inspection per week is required.

The operator shall immediately notify the Supervisor, Pollution Emergency Alert System, of any spill or loss, followed by a written report within 10 days to the District Office of the Geological Survey Division. The report shall describe the cause and volume of the loss, cleanup measures taken, volume of recovered fluid and measures taken to prevent a similar problem in the future.

Enforcement:

Any person who intentionally makes or causes to be made, false entry or statement in an account, record or memorandum, is guilty of a felony punishable by a fine of not more than $3,000 or imprisonment for not more than three years, or both.

A person who violates these rules shall be subject to a penalty of not more than $1,000 for each violation, and each day that each violation continues constitutes a separate offense.

MICHIGAN

UNDERGROUND INJECTION CONTROL

Agency in Charge:	Geological Survey Division Michigan Department of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/334-6974
Key Laws or Regulations:	Mineral Well Act 315 of 1969, as amended; Michigan Oil and Gas Regulations Act 61 of 1939, as amended.
Permits Required:	Application for a drilling permit shall be made on forms provided by and returned to the Permit Unit, Geological Survey Division. Brine disposal wells shall be so completed that the injection of brine shall be into a formation approved by the Supervisor. If a fluid of any type is to be injected into a producing formation, the operator shall notify all offset operators by certified mail of such intention. Copies of those letters shall be filed with the application. If an offset operator protests, the Supervisor shall conduct a public hearing to receive evidence and testimony pertaining to the need or desirability of approving the application. The Supervisor may approve the application and grant the permit if no protests are received within ten (10) days after mailing date of the letters of notification (Act 61, R299.1606, Rule 606). If the well is to be in a stream, lake or impoundment or other body of water, the permit must be approved by the Natural Resources Commission. Exceptions to lease conditions on state-owned minerals also require NRC approval.

Application forms shall be filled in with all data and information required by the Supervisor, plus a survey record, supplemental plats, maps and drawings, and a detailed environmental assessment.

Processing time for applications varies with the amount of information required, hearings, on-site inspections by MDNR personnel and thoroughness of the data submitted. Normally, no more than 6 weeks lapse from application filing date and the decision to grant or deny the permit.

All permits to drill and operate require bonding.

Within 60 days after completion of a well, the operator must submit a well completion report to the Supervisor.

An operating permit is valid for the life of the project unless it is modified or terminated by the MDNR for just cause.

'rogram Description:

Brine disposal wells shall be cased and sealed to prevent the loss or injection of brine into any unapproved formation. Groundwater monitoring wells may be required to detect any leakage of hydrocarbons or brines into the groundwater.

Wells drilled or reworked for use in injecting fluids for enhanced recovery shall be adequately cased and sealed to prevent injection or migration of fluids into any strata or formation other than the objective formation.

The operator of any enhanced recovery of Class II injection project shall notify the Supervisor immediately of the commencement or abandonment of injection operations.

The operator shall keep accurate records of all oil and gas produced, volumes of fluids injected, injection pressure readings and such other data as may be required, and shall be filed with the

Supervisor at regular intervals as specified in the permit.

The Region V Federal E.P.A. implements the mechanical integrity test program. EOR operators must adhere to those standards for monitoring and well testing practices.

All losses of hydrocarbons, brine or chemicals used in injection wells shall be reported to the appropriate field office of the Geological Survey Division during normal business hours via telephone or in person. Written notification shall be submitted to the appropriate field office on Form PR-7233 within 10 calendar days from the time of discovery (Instructions for Reporting Losses/Spills, PA61, as amended 9/04/90).

Enforcement:

A person who violates these rules shall be subject to a penalty of not more than $1,000 for each violation. Each day that such violation continues constitutes a separate offense.

MICHIGAN

HAZARDOUS WASTE

Agency in Charge:	Waste Management Division Michigan Department of Natural Resources P.O. Box 30241 Lansing, MI 48909 517/373-2730
Key Laws or Regulations:	Michigan Hazardous Waste Management Act, Public Act 64 of 1979, as amended.
Permits Required:	Regulations governing pits for surface water waste are applicable, as in the WATER POLLUTION section of this writing. There are no specific regulations governing the disposal of solid or hazardous waste materials from EOR operations.

MISSISSIPPI

AIR POLLUTION

Agency in Charge:	Bureau of Pollution Control Department of Environmental Quality P.O. Box 10385 Jackson, Mississippi 39289-0385 601/961-5171
Key Laws or Regulations:	Regulation APC-S-1 through APC-S-5; 40 CFR, Parts 51, 52, 60, 61.
Permits Required:	Permit to Construct, Permit to Operate. In the case of new facilities, application may be made for both permits simultaneously on the form provided by the Permit Board. A permit will generally be for a specific site identified in the application. Each application for a Permit to Construct may be required to be accompanied by information on the applicant's compliance history, two (2) complete sets of site drawings, construction drawings, design calculations and specifications plus any additional information necessary to evaluate the design adequacy of the new facility. The Department of Environmental Quality (DEQ) follows CFR 40, Part 52.21 (APC-S-5) regarding public information procedures. DEQ will provide opportunity for public comment. Public information will include that supplied by the applicant, DEQ's analysis of the effect of construction or modification on ambient air quality and a recommendation for permit issuance or denial.

Public notification shall include, as a minimum: 30-day period for submittal of public comment; advertisement in a prominent location in the area to be affected; a notice available for public inspection in at least one location in the area affected. A copy of the notice will be sent to the Administrator of the Region IV federal EPA. The Permit Board may provide notice to the public and provide opportunity for public comment on any application for a Construction Permit or Operating Permit.

The Permit Board may hold a public hearing on any application for either permit if it thinks there is sufficient interest in the application. Normally, it takes about 90 days from application filing date to receive a permit; but not more than 180 days.

A construction permit will expire if construction does not begin within 18 months from the date of issuance or if construction is suspended for 18 months or more.

An operating permit shall expire for a fixed term up to five (5) years from date of issuance. Not less than 180 days prior to the expiration date an operator may file an application for a renewal of a Permit to Operate.

An operating permit may be suspended or revoked by the Permit Board for violation of applicable regulations, for not complying with orders to reduce emissions, or if a facility ceases to operate for 18 months or more.

Program Description:

Upon completion of construction the owner or operator shall notify the Permit Board. Any modification from the originally approved plans and specifications shall be identified to the Board.

Where performance testing is required in any permit, it will be done at the expense of the owner or operator. The Permit Board may monitor and conduct performance tests. Performance testing is required of all facilities for which there is an applicable New Source Performance Standard

(NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP). Most steam thermal enhanced oil recovery units would not be subject to either NSPS or NESHAP.

During operations, emissions shall not exceed maximum levels specified in the permit. The Permit Board may require the installation and maintenance of monitoring equipment, and require the maintenance of air monitoring records. Copies of such records shall be submitted to the Board upon request. Every facility which emits more than 0.25 tons per day of total air contaminants shall comply with an emissions reduction schedule in the event an emergency episode occurs. The emissions reduction schedule is subject to review and approval by the Mississippi Commission on Environmental Quality (APC-S-3).

No person shall cause or allow the discharge into the ambient air from any point source of emissions, any air contaminant of such opacity as to obscure an observer's view to a degree in excess of 40% opacity.

The maximum discharge of sulfur oxides from any fuel burning installation shall not exceed 4.8 pounds per million Btu heat input.

An excessive discharge of pollutants to the atmosphere shall be reported by the operator to the Commission as soon as possible after discovery; no later than 24 hours. The emissions reduction plan shall be implemented immediately upon discovery.

A written explanation shall be mailed to the Commission within five (5) business days after discovery.

Enforcement:

Any person who violates DEQ rules intentionally, who lies or omits any information in any reports, or who conceals any information, is subject to criminal prosecution.

In addition, for willful noncompliance of these regulations, a person may be subject to a penalty not exceeding $25,000 per day per violation.

MISSISSIPPI

WATER POLLUTION

Agency in Charge:	Mississippi Dept. of Environmental Quality Office of Pollution Control P.O. Box 10385 Jackson, Mississippi 39289-0385 601/961-5171
Key Laws or Regulations:	"Wastewater Permit Regulations for National Pollutant Discharge Elimination System (NPDES)... and State Operating Permits, as amended July 25, 1991"; 40 CFR, parts 122-125; Mississippi DEQ Regulations 49-17-1 through 49-17-43.
Permits Required:	Any person proposing to discharge wastes to waters of the state shall file an application for an individual NPDES permit, or state permit, at least 180 days prior to the commencement of discharge or, in the case of "notice of intent" for coverage under an issued general NPDES permit, at least 90 days before commencing construction, or in accordance with a schedule determined by the Permit Board. Permit applications shall be made on forms provided by the Permit Board and/or the Department of Environmental Quality. An operator or owner proposing to discharge water and wastes generated from enhanced oil recovery operations shall not be required to apply for a permit from the Permit Board. However, it cannot be stressed too strongly, that an operator or owner at least file a notice of intent (NOI) no later than 180 days prior to commencing construction of any EOR facility. By taking such action, even

though a permit may not be required, the operator or owner will have initiated a favorable rapport with the enforcement authority. The proper person to contact is the Executive Director of the Department of Environmental Quality.

Should the Executive Director determine that a permit is required, the operator or owner shall file a completed application form plus any other information deemed necessary to accompany it. When the Executive Director or his representative is satisfied that the application is complete, a preliminary determination will be made to issue or deny a permit.

A draft permit shall be mailed to the applicant and to the Regional Administrator before public notice of the draft NPDES permit. A public notice shall be available at the DEQ in Jackson. Up to 30 days are allowed for public comments after the date of posting or publication.

A fact sheet shall be prepared by the Executive Director or his designee for every NPDES permit required to have a fact sheet under Federal regulations, and it shall be available at the DEQ office in Jackson. Upon posting of the draft permit and fact sheet, copies shall be transmitted to all agencies and other entities specified in EPA regulations. Any federal, state of local agency has 45 days to comment.

If a public hearing is requested by an individual or an agency, and is approved by the Permit Board, notice of the public hearing shall be transmitted to the applicant and published in at least one (1) newspaper of general circulation in the geographical area of the proposed site at least 30 days before the hearing. Notice shall also be sent to all persons and governmental agencies which received a copy of the draft permit or the fact sheet.

An NPDES permit shall have a fixed term not to exceed five (5) years. A state permit may be issued for a period up to the operating life of the facility.

At least 180 days prior to the expiration date of a permit, a permittee who wishes to operate under such permit shall submit an application to the Executive Director for re-issuance.

Program Description:

The Permit Board may prescribe monitoring requirements for any discharge authorized by a state or NPDES permit. This includes installation, use and maintenance of monitoring equipment as well as monitoring methods and frequency of monitoring waste discharge.

All records shall be retained by the permittee for a minimum of three (3) years. The Permit Board may require an operator to periodically report the results of all monitoring on a form supplied by the Board, but in no case shall the frequency be less than once a year.

Permittees shall report any instance of noncompliance orally to the Head of the Office of Pollution Control within 24 hours of becoming aware of it. A written report shall also be provided within five (5) days of discovery, in which the condition of noncompliance shall be described in detail, its cause if known, period of noncompliance, steps taken to reduce or eliminate and prevent recurrence of the noncompliance.

Enforcement:

Any person found to be violating any permit rule, or regulation, or written order by the DEQ shall be subject to a civil penalty of not more than $25,000 for each violation. Each day upon which a violation occurs shall be a separate and additional violation.

Operators or owners of facilities which cause pollution shall be liable for the cost of cleanup and remedial action. If immediate cleanup or remedial action is necessary, the DEQ may contract for the work, costs for which will be recovered from the operator or owner of the facility which caused the pollution to occur.

MISSISSIPPI

UNDERGROUND INJECTION CONTROL

Agency in Charge:

State Oil and Gas Board
500 Greymont Avenue, Suite E
P.O. Box 1332
Jackson, Mississippi 39202
601/354-7142

Key Laws or Regulations: Statewide Rules and Regulations; Title 53, Rule 63.

Permits Required: UIC permit.

The application for an EOR injection well or fluid disposal well shall be made on Oil and Gas Board Form No. 2 and the proposed plan of work attached (Rule 63.5.A).

The applicant shall give notice to all parties of interest and the surface owner, by publishing in a newspaper of general circulation in the county where the well will be located and a statewide newspaper, and in the manner and form approved by the Board. The applicant shall file proof of publication prior to the hearing or administrative approval.

A hearing shall be held on all applications. Persons requesting exceptions to this rule shall be required to give testimony before the Board to justify such exceptions.

Permits authorizing injection into EOR Class II wells and produced fluid disposal wells shall remain valid for the life of the wells unless revoked by the Board for cause. A permit may be modified, revoked and re-issued after modifications, after notice and hearing.

About 45 days will normally lapse from acceptance of a complete application to the date of issuance for a UIC permit -- minimum is 30 days.

Program Description:

All new EOR injection or fluid disposal wells shall be sited so that they inject into a formation which is separated from any USDW by a confining zone free of known open faults or fractures within the area of review that are potential flow conduits. They shall be cased to a point at least 100 feet into the first confining unit immediately below the lowermost USDW (Rule 63.6).

Before operating any new or converted EOR injection or fluid disposal well, it shall be subjected to a mechanical integrity test (MIT) under the supervision of the Board. The operator shall notify the Supervisor at least 48 hours prior to any testing. Mechanical integrity tests shall be done at least once every five years thereafter or after every workover. A complete record of all MITs shall be prepared, verified and filed with the Board within 30 days after testing.

The operator shall notify the Board, in writing, within 30 days after injection or disposal has started. Mechanical failures or downhole problems will be reported to the Supervisor by the operator within 24 hours after discovery. Written notice shall be submitted to the Supervisor within five (5) days of the occurrence. Any mechanical work done on the well shall be witnessed and tested for MIT by a Board inspector unless witnessing is waived by the Supervisor.

The operator shall monitor the injection fluids at intervals specified by the Board; monthly for EOR operations, weekly for fluid disposal operations. They shall be reported monthly on Oil and Gas Board Form 14. All monitoring records shall be retained for a period of three (3) years.

Enforcement:	Any person who makes a false statement or who deliberately omits information in any document submitted to the Board shall be subject to a penalty of not more than $10,000 per day for each violation.

MISSISSIPPI

HAZARDOUS WASTE

Agency in Charge:	State Oil and Gas Board 500 Greymont Avenue, Suite E P.O. Box 1332 Jackson, Mississippi 39202 601/354-7142
Key Laws or Regulations:	Code of Federal Regulations (40 CFR, Parts 260 thru 271) Statewide Rules and Regulations; Rules 45 and 63; Mississippi Department of Environmental Quality Regulation 17-17-47, effective July 1, 1990.
Permits Required:	For disposal sites only. Permit to construct. Mississippi adopted CFR rules and issues the permits under the state's jurisdiction. Under 40 CFR 261.4; "Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy", are materials which are not considered to be hazardous wastes. No hazardous waste permit may be required for drilling mud pits and/or wastewater discharge pits. However, many drilling mud chemicals are considered to be hazardous, and their storage and disposal come under the aegis of CFR regulations, so are included under RCRA permit rules. Permits to construct are required for mud pits and produced water storage pits to prevent pollution of state waters and contamination of soils. Those regulations are summarized in the following text.

Application for Earthen Pit, Form 18, shall be filed by the operator of an EOR facility planning to use said pit for temporary saltwater storage and evaporation, or for emergency saltwater storage. The application shall contain a full description of the proposed facility, including pit size, barrels capacity, lining to be used, type of fluids to be placed in the pit, distance to the nearest pit of that type within the same field or immediate area.

Other information such as reasons for needing the pit, number of wells that will use it and any additional data required by the Board shall be included in the application.

The applicant shall give notice to all parties of interest and the surface owner, by publishing in a newspaper of general circulation in the county where the well will be located and in a statewide newspaper, and in the manner and form approved by the Board. Thirty days are allowed for public comments.

A hearing shall be held on every application at least 20 days but within 30 days, after public notice of such hearing, which shall be conducted by the Board. Notice of the public hearing shall be published by the Board.

About 45 days normally lapse from acceptance of a complete application to the date of issuance for a permit to construct.

If construction of a salt water storage pit has not commenced within six (6) months after the date of issuance, the permit is voided.

No permit shall be valid for a period of more than two (2) years from the date of issuance unless it is renewed by the Supervisor.

Program Description:

Temporary salt water storage pits shall be lined with an impervious material and shall be so constructed that salt water stored will not cause waste by pollution of fresh waters or contamination of soil. Each pit shall be protected from surface waters by dikes and drainage ditches.

The fluid level shall never rise to within one (1) foot of the top of pit walls or dikes, and only produced water shall be intentionally placed in the pit.

When use of the pit is to be discontinued, the Supervisor shall be notified in writing. When abandoned, the pit shall be emptied, back-filled, leveled and compacted.

Emergency pits may be used in the event of a disposal well or water injection well failure. Such a pit shall not be used for more than sixty (60) days. The operator shall notify the Supervisor within 72 hours of commencement and completion of such emergency use. Within two (2) weeks after the emergency period, the pit shall be emptied, and shall be inspected by a Board representative.

Should the Supervisor of the State Oil and Gas Board determine that the continued operation of a pit would cause pollution of fresh water or contamination of soils outside the pit confines, he may prohibit further use of the pit until the condition is corrected. If corrective measures are not satisfactorily completed within thirty (30) days, the Supervisor may revoke the permit.

Enforcement:

When a pit permit is revoked, the pit shall be emptied, back-filled, leveled and compacted within thirty (30) days or additional penalties may be assessed.

Any person who knowingly and willfully violates these rules is subject to the penalties described in Regulation 53-1-47.

MONTANA

AIR POLLUTION

Agency in Charge:

Air Quality Bureau
Montana Dept. of Health & Environmental Sciences
Cogswell Building, 1400 Broadway
Helena, Montana 59620
406/444-3454

Key Laws or Regulations: Administrative Rules of Montana; Air Quality Rules, Montana Clean Air Act.

Permits Required: Construction and Operation permit (combined).

Drilling rig stationary engine and turbines which do not have the potential to emit more than 100 tons per year of any pollutant other than lead are excluded from the necessity of obtaining a permit.

All other sources and stacks which do not have the potential to emit more than 25 tons per year of any pollutant other than lead are excluded from the necessity of obtaining a permit.

A source which emits less than five tons per year of lead is not required to get a permit (Ref. ARM 16.8.1102).

The Department may issue an air quality permit for construction and operation of a major source or a major modification if the requirements of the Montana Clean Air Act and ARM Title 16, Chapter 8, Sub-chapter 11 are met.

The owner or operator of a new or altered source shall file application at least 180 days before construction is to begin on a form provided by the Department.

The owner or operator of a proposed major stationary source or major modification shall submit to the Department all information necessary to make an application determination:

a. Complete description of the facility, location, nature of emissions, operating schedule, specifications and drawings;
b. Detailed construction schedule;
c. Air quality baseline data and projected meteorological impact;
d. Detailed description of planned emission reduction system;
e. Map showing the location of the source, plus any other information required by the Department (Ref. ARM 16.8.930 and ARM 16.8.1105).

The applicant shall publish notice of application for a permit in a newspaper of general circulation in the area affected by the proposed emission source. The notice shall be published within 10 days before submittal of the application, nor later than 10 days after submittal date (ARM 16.8.1107).

Within 40 days after receiving a complete filed application for a permit, the Department shall make a preliminary determination to issue or deny the permit. The Department shall also notify interested members of the public of its preliminary decision, and they are given 15 days after notice is mailed to respond in writing.

A final decision must be made by the Department within 60 days after a completed and filed application is submitted to the Department.

An air quality permit is valid until revoked or modified, except that a permit issued prior to construction may contain a clause providing that the permit will expire if construction has not commenced within the time specified in the permit (ARM 16.8.1111).

Program Description:

The operator of a major stationary source, after construction or modification, shall conduct such ambient monitoring as the Department deems necessary.

All monitoring must be performed in accordance with 40 CFR Part 58, Appendix B.

Emissions of particulate matter shall not exhibit an opacity of 20 percent or more averaged over six consecutive minutes. Maximum allowable emissions of particulate matter is 0.03 pounds per million Btu per hour of heat input for fossil fuel burning equipment.

No liquid fossil fuel can be used which contains more than 0.8 pounds SO_2 per MMBtu heat input.

NO_2 emissions from gaseous fossil fuel shall not exceed 0.2 lb. per MMBtu heat input or 0.3 lb. per MMBtu heat input from the use of gaseous fossil fuels.

CO emissions shall not exceed nine parts per million, eight hour average, more than once per year.

Operator shall maintain monitoring records and shall submit written reports for every calendar quarter. Records shall be retained for at least two years following the date of each measurement, any maintenance, reports and any other records.

Excessive discharges shall be reported as soon as possible to the director, but within 24 hours, followed by a written report within 10 days in which a full explanation is provided on what happened and what was done to alleviate or correct the excess emission.

Enforcement:

A person who violates a rule or order, or permit other than 75-2-105 is guilty of a criminal offense subject to a fine not to exceed $1,000. Each day of violation constitutes a separate offense. A person who violates 75-2-105 is subject to a fine not exceeding $1,000.

Any person who violates any rule, order, or permit given by the Department shall be subject to a civil penalty not to exceed $10,000. Each day of violation shall constitute a separate offense. This civil penalty is in lieu of the criminal penalty.

MONTANA

WATER POLLUTION

Agency in Charge:

Water Quality Bureau
Montana Dept. of Health & Environmental Sciences
Cogswell Building, 1400 Broadway
Helena, Montana 59620
406/444-2406

Key Laws or Regulations:

Montana Water Quality Act 75-5-101 et. seq. MCA; Administrative Rule of Montana, Title 16, Chapter 20, Sub-chapter 13; Federal Clean Water Act and 40 CFR, parts 122 124, 125, 136.

Permits Required:

MPDES permit.

Applications for new discharge permits shall be submitted at least 180 days before the date on which discharge is to commence. Applicants shall use application forms provided by the Department.

The Department may not issue a permit before receiving an application form and supplemental attachments completed to the Department's satisfaction. Ref.: Rule 16.20.1310.

New applicants shall provide at least the following information:

a) Identification of the applicant, activities requiring an MPDES permit, location of the facility, operator's name, address, telephone number, etc.;
b) Statement whether facility is located on Indian lands or not;
c) Listing of all permits or construction approvals already received or applied for;

d) Topographic map extending one mile beyond the source's property boundaries depicting the facility, each well where fluids from the facility are injected, water wells, springs, other surface water bodies in the map area;
e) Briefly describe the nature of the applicant's business.

Existing discharges applying for MPDES permits shall provide the following information on forms provided by the Department:

a) The latitude and longitude and the name of the receiving water;
b) A line drawing of the water flow through the facility with a water balance, showing operations contributing wastewater to the effluent and treatment units;
c) A narrative identification of the operation which contributes wastewater, a description of any treatment the wastewater receives and the ultimate disposal of any solid or fluid wastes;
d) A description of the frequency, duration and flow rate of each discharge occurrence;
e) Actual production as required by ARM 16.20.1321.
f) Any other information required by the Department. Ref.: ARM 16.20.1310.

Applicants shall keep records of all data used to complete applications and any supplemental information submitted for a period of at least three years from the date the application is signed.

Prior to issuing an MPDES permit, the Department shall publish a public notice of the application. After publication, a 30-day comment period is allowed and a hearing may be held.

Every MPDES permit must have a fixed term not to exceed five years. The Department may modify, suspend or revoke in whole or in part an MPDES permit for just cause.

Program Description:

The operator shall take all reasonable steps to minimize or prevent any discharge in violation of his permit. He shall at all times properly operate and maintain all facilities to achieve compliance with permit conditions.

The operator shall sample or monitor at intervals specified in the permit, and shall keep all monitoring records and reports for a period of three years from the date of sampling, measurement, report or application. He shall allow the Department authorized representative access to all records.

Any spill, improper discharge or leak, or other condition of noncompliance which may endanger health or the environment shall be reported orally within 24 hours from the time the operator becomes aware of the condition. A written report shall be submitted within five days of the occurrence. The report shall describe the event and its cause; period of noncompliance; corrective measures taken; steps or plans to reduce, eliminate and prevent reoccurrence of the noncompliance.

Enforcement:

The act provides that any person who violates a permit condition is subject to a civil penalty not to exceed $25,000 (effective 10/1/91) per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a fine not to exceed $25,000 per day or violation or imprisonment for not more than one year, or both.

MONTANA

UNDERGROUND INJECTION CONTROL

Agency in Charge:

Water Quality Bureau
Montana Dept. of Health & Environmental Sciences
Cogswell Building, 1400 Broadway
Helena, Montana 59620
406/444-2406

Key Laws or Regulations:

Montana Water Quality Act 75-5-101 et. seq. MCA; Administrative Rules of Montana, Title 16, Chapter 20, Sub-chapter 10; Federal Safe Drinking Water Act.

Permits Required:

MGWPCS permit.

Applications shall be filed at least 180 days prior to the day on which it is desired to commence operation of the source. All applications shall be submitted on forms obtained from the Department and must contain the following information:

a) A specific site plan, indicating topography;
b) Location of treatment works and disposal systems;
c) Location of adjacent state waters;
d) List of surface owners and lessees of land within one mile of the proposed source;
e) Location of water supply wells and springs within one mile of the proposed source;
f) Description of waste or process solutions to be contained on site;
g) Information describing existing groundwater quality and uses within one mile from the site;
h) Any additional data and information the Department may require.

The Department will determine the completeness of the application within 30 days. After it has determined that all of the required information has been submitted, the Department will make a tentative determination to issue or deny approval of an MGWPCS permit.

If the decision is to issue an MGWPCS permit, the Department will issue a draft permit, issue a public notice of the completed application, and may conduct a public hearing within 30 days after the termination of the 30 day comment period.

After making the final determination on a MGWPCS permit application, the Department will issue the permit or give written notice of denial.

Every issued MGWPCS permit must have a fixed term not to exceed 10 years.

Program Description:

Each issued MGWPCS permit contains special conditions which will assure compliance with groundwater quality standards. All contain discharge limitations, compliance schedules, prohibition of certain discharges without Department approval, self-monitoring requirements, recording and reporting procedures.

Operators are required to maintain self-monitoring records for at least three years.

The owner or operator, or person, responsible for a spill or unanticipated discharges of toxic substances or other material that would lower the quality of state groundwaters must notify the Department as soon as possible by contacting the Montana Hazardous Materials Emergency Response System, and provide all relevant information about the spill. He shall take remedial measures immediately, monitor the depth, direction, rate of movement of any contaminated groundwaters and of the spilled material, and shall calculate the probable consequences of the spill.

Enforcement:	The act provides that any person who violates a permit condition is subject to a civil penalty not to exceed $25,000 (effective 10/1/91) per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a fine not to exceed $25,000 per day or violation or imprisonment for not more than one year, or both.

MONTANA

HAZARDOUS WASTE

Agency in Charge:	Hazardous Waste Bureau Montana Dept. of Health & Environmental Sciences Cogswell Building, 1400 Broadway Helena, Montana 59620 406/444-2821
Key Laws or Regulations:	Code of Federal Regulations (40 CFR, Parts 260 thru 271).
Permits Required:	For disposal sites only. Montana adopted CFR rules, and issues the permits under the state's jurisdiction. Under 40 CFR 261.4; "Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy," are materials which are not considered to be hazardous wastes. No hazardous waste permit may be required for drilling mud pits and/or wastewater discharge pits. However, many drilling mud chemicals are considered to be hazardous, and their storage and disposal come under the aegis of CFR regulations, so are included in RCRA permit rules.

NEW MEXICO

AIR POLLUTION

Agency in Charge:

Air Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive – Runnels Building
P.O. Box 26110
Santa Fe, New Mexico 87502
505/827-0070

Key Laws or Regulations: Air Quality Control Regulation 702.

Permits Required: Construction permit and PSD permit.

Any person constructing or modifying a stationary source which has a potential emission rate greater than 10 tons per year of any regulated air contaminant or one ton per year of lead shall file a notice of intent with the Department.

Any person constructing or modifying a stationary source which has a potential emission rate greater than 10 pounds per hour of any regulated air contaminant (or 25 tons per year), or which may emit more than five tons of lead per year must obtain permits from the Department.

Any person constructing or modifying any source or installing any equipment which is subject to AQCR 750 New Source Performance Standards, AQCR 751 (NESHAP), or any other New Mexico Air Quality Control Regulation which limits any regulated air contaminant shall obtain permits from the Department.

Any person constructing a new major stationary source or a major modification per EPA's PSD

rules is additionally subject to those rules through New Mexico's delegation to enforce them.

Temporary installations and portable stationary sources are also subject to these regulations. A separate permit may be required for each unit.

Applications shall be made on forms provided by the Department prior to the commencement of construction, modification or installation.

Permit applications shall contain a complete description of the facility, estimates of maximum potential emissions during malfunction, start-up, shutdown, evidence that emissions during normal operations will not violate any NSPS, NESHAP, dispersion modelling showing compliance with state and federal air quality standards and PSD increment.

Applicant shall attach to the application an operational plan to mitigate emissions during malfunction, start-up or shutdown; a topographic map showing the exact location of the source; process flow sheet; full description of emissions control equipment and air quality monitoring system; other information required by the Department (AQCR 702, Part Two, Section D.1).

In addition to the above requirements, each application shall include proof that the applicant provided notice of the filing of the application to the public. Notice shall be done via certified mail to owners of all properties within 100 feet of the property on which the proposed facility will be located in a Class A or Class H county or municipality of more than 2500 people, or to owners of all properties within 1/2 mile if in other Class counties or municipalities.

Notification shall be made via certified mail to all municipalities and counties in which the facility will be located and to municipalities and counties within 10 miles of the property on which the facility is proposed to be built or installed.

Other notifications include: publish once in a newspaper of general circulation in each county in which the property on which the facility is to be operated is located; posted in at least four conspicuous public places; announced by a local radio or television station. Ref. AQCR 702, Part Two, Section D. 2.

The Department has 30 days to rule an application complete. A review and preliminary determination are made, at which point the Department notifies the public of this determination. It normally takes no more than 120 days to rule on an application, unless a public hearing is held, then a maximum of 180 days.

A permit may be cancelled if construction or modification is not commenced within two years of the approval date, or if during construction or modification, work is suspended for one year.

Program Description:

No construction or operations may begin prior to issuance of a permit. Operators shall restrict emissions to levels not exceeding those specified in their permits, shall observe all Air Quality Control Act and Federal Clean Air Act regulations, including compliance with NSPS, NESHAP and PSD.

Operators may be required to maintain records of the nature and amount of emissions, and will periodically report them and the performance of the air pollution control equipment to the Department.

The operator of a new unit will notify the Department in writing: anticipated date of initial start-up not less than 30 days prior to the date; actual date of the initial start-up within 15 days after the start-up date.

Within 60 to 180 days after start-up the operator may be required to conduct a performance test approved by the Department.

	Excess emissions shall be reported by the operator to the Department as soon as possible, but no later than 24 hours after the start of the next business day followed by a written notification the following business day. Within 10 days of the discharge, the operator will submit a detailed written explanation (AQCR 801).
Enforcement:	Violations, including operating without a permit, are subject to the imposition of fines up to $1,000 per day for each violation. Operators are given a chance for voluntary correction to compliance pursuant to the New Mexico Air Quality Control Act. Typically, they are allowed 10 days to submit a plan for achieving compliance, and are given up to 30 days to complete the correction.

NEW MEXICO

WATER POLLUTION

Agency in Charge:	Oil Conservation Division New Mexico Water Quality Control Commission 310 Old Santa Fe Trail, P.O. Box 2088 Santa Fe, New Mexico 87501-2088 505/827-5800
Key Laws or Regulations:	Water Quality Control Commission Regulations, New Mexico Water Quality Act; Federal E.P.A. regulations 40 CFR part 435, subpart C.
Permits Required:	NPDES permit from the Federal E.P.A.; but the New Mexico Oil Conservation Division reviews applications first. These permits prohibit all discharges of pollutants to waters of the United States. No new NPDES permits are being issued unless agriculture and/or wildlife propagation are to be affected. The above statement means water discharges can be used if the produced water is of good enough quality to be used for livestock or wildlife watering, or other agricultural uses, and that the produced water is actually put to such use during periods of discharge. Otherwise, NPDES permits prohibit the discharge of any wastewater from any EOR facility into any pond, lake, stream, wetland or coastal waterway of the United States.

Program Description:

Best management practices shall be used to ensure that mud pits and receiving pits will not leak onto ground surface or subsurface (40 CFR 435, Part II, Section A).

Wastewater surface discharges require an NPDES permit. However, a notice of intent to discharge must be filed with the Oil Conservation Division.

Notification of spills must be reported to the Division within 24 hours of discovery, followed by a written report explaining details of the spill and action taken to clean it up.

Enforcement:

Violations of the Water Quality Act can be cause for termination or modification of a permit (New Mexico Water Quality Act, Sect. 74-6-5.J). A person who violates any provision of this section shall be punished by a fine of not less than $300 or not more than $10,000 per day or by imprisonment for not more than one year or both. In addition, a trial court may impose a civil penalty not exceeding $5,000 per day of violation.

NEW MEXICO

UNDERGROUND INJECTION CONTROL

Agency in Charge:	Oil Conservation Division New Mexico Water Quality Control Commission 310 Old Santa Fe Trail, P.O. Box 2088 Santa Fe, New Mexico 87504-2088 505/827-5800
Key Laws or Regulations:	New Mexico Water Quality Act, Oil and Gas Rules 701 through 711; N.M.S.A. Sec. 70-2-29 and 70-2-31.
Permits Required:	UIC permit. Any person who intends to begin discharging any pollutant into the ground shall notify the director at least 120 days ahead of the effective date, providing the name of the person, address of the person, location of the intended discharge, quantity of the discharge and concentration of contaminants. Notification to the municipality in which the discharge is to take place shall accompany the notice to the Division. Applications for salt water disposal wells, EOR wells or other Class II wells must be submitted to the Division using state form C-108. Copies of the application via certified or registered mail must be provided to the land owner on which the well is to be located and to each leasehold operator within 1/2 mile of the wellsite. Notice of application shall be published once in a local newspaper of general circulation. Written objections must be filed with the Division within 15 days from the date of publication or the date of receipt of the application. If an objection is received, or a

hearing is required, a hearing is set with notice by the Division.

Form C-108 is filed for a project, but data is required to be supplied for each well. A complete description of the project is to be provided in the application, including geology characteristics, evidence that the production zones are depleted to the point that enhanced recovery is necessary. Several other attachments shall accompany the application, including: map that identifies all wells and leases within two miles of the site; a description of each well within that area; chemical analyses of fresh water from two or more fresh water wells within one mile of the project (if available); all other information required by the Director.

Lapsed time from application filing date to approval is usually two months. Permits are valid for the life of the project unless they are modified or revoked for cause.

Program Description:

The mechanical integrity of any injection well must be demonstrated prior to initiating operations. The state does the initial inspection of all new wells and at least once a year thereafter. Pressure integrity tests are conducted every five years.

Immediately upon commencement of injection operations, the operator shall notify the Division of the date such operations began.

Operators are required to monitor injection rates, pressures, production rates, any leaks, and must maintain monitoring records for at least five years. They shall submit monthly monitoring reports, on state forms, to the Division.

Operators shall have procedures in place for detecting any failure of the system and contingency plans for coping with any failures.

Failure of any injection well, producing well or surface facility which may endanger underground

sources of drinking water shall be reported immediately to the Division, and will be restricted or shut-in until the failure is identified and corrected.

Enforcement:

Operators who are not complying with any rule or order pursuant to the Oil and Gas Act are usually given time to get into compliance.

Violators are subject to civil penalties of up to $1,000 per day per violation, and each day constitutes a separate violation.

Criminal penalties for knowing and willful violations can result in fines up to $5,000 or imprisonment for three years, or both. Each day of violation constitutes a separate offense. Aiders and abettors are subject to the same penalties.

NEW MEXICO

HAZARDOUS WASTE

Agency in Charge:	Hazardous Waste Bureau Environmental Improvement Division New Mexico Health and Environment Department 1190 St. Francis Drive – Runnels Building Santa Fe, New Mexico 87502 505/827-2929
Key Laws or Regulations:	1990 Code of Federal Regulations (40 CFR, Parts 260 thru 271).
Permits Required:	For disposal storage and treatment facilities. New Mexico periodically adopts Federal regulations, but issues the permits under the state's jurisdiction. Under 40 CFR 261.4; "Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy," are materials which are not considered to be hazardous wastes. No hazardous waste permit may be required for drilling mud pits and/or wastewater discharge pits unless the wastewaters are secondarily processed for oil recovery. However, any waste chemicals, e.g. degreasing solvents, are likely to be RCRA regulated.

NORTH DAKOTA

AIR POLLUTION

Agency in Charge:

Environmental Engineering Division
State Dept. of Health & Consolidated Laboratories
1200 Missouri Avenue, P.O. Box 5520
Bismarck, North Dakota 58502-5520
701/221-5188

Key Laws or Regulations:

North Dakota Century Code, Article 33-15.

1. New Source Performance Standards (NSPS) in North Dakota are nearly identical to Federal NSPS requirements.
2. Sources not subject to NSPS or PSD are subject to Articles 33-15-02, 33-15-03, 33-15-05, 33-15-06, 33-15-07, 33-15-16 and 33-15-20, as applicable.

Permits Required:

Permit to Construct and Permit to Operate (Art. 33-15-14).

Program Description:

Any oil or gas production facility that emits or has the potential to emit 250 tons per year or more of any air contaminant regulated under North Dakota Century Code (NDCC) Chapter 23-25, shall comply with permitting requirements of North Dakota Air Pollution Control Rules (NDAPCR) Chapter 33-15-15, Prevention of Serious Deterioration (PSD).

The owner or operator of any oil or gas facility shall install equipment necessary to ensure that emissions comply with ambient air quality standards (NDAPCR) Chapter 33-15-02 including H_2S and SO_2; the Class I and Class II increments for SO_2, NO_x and particulate matter of Chapter 35-15-15, if applicable.

No operator shall cause to be discharged to the atmosphere from any affected facility any gases which exhibit greater than 20 percent opacity (six minute average) of particulate matter (Chapter 33-15-03).

Enforcement:

If, after completion of the administrative hearing process, the department determines that a violation of this chapter, or any rule, regulation, or order of the department issued under this chapter, has occurred, it shall make all of its evidence and findings available to the attorney general for use in any including an action for injunctive relief.

Any person who willfully violates this chapter or any permit condition or limitation implementing this chapter shall be punished by a fine of not more than twenty-five thousand dollars per day of violation, or by imprisonment in the county jail for more than one year, or by both such fine and imprisonment. If the conviction of such person under this subsection, punishment shall be by a fine or not more than fifty thousand dollars per day of violation, or by imprisonment in the county jail for not more than two years, or by both such fine and imprisonment.

Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under this chapter, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this chapter, shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment in the county jail for not more than six months, or by both such fine and imprisonment.

Any person who violates this chapter, or any permit condition of limitation implementing this chapter, and any person who violates any order issued by the department, shall be subject to a civil penalty not to exceed ten thousand dollars per day of such violation.

NORTH DAKOTA

WATER POLLUTION

Agency in Charge:	Division of Water Quality State Dept. of Health & Consolidated Laboratories 1200 Missouri Avenue, P.O. Box 5520 Bismarck, North Dakota 58502-5520 701/221-5210
Key Laws or Regulations:	North Dakota Century Code, Chapter 61-28, Rules 33-16.
Permits Required:	NDPDES permit issued by the Department of Health and Consolidated Laboratories. Any person who conducts waste disposal activities must file a completed NDPDES application no less than 180 days prior to the day on which it is desired to commence operations. Application shall contain a complete description of the facility and measures being taken to adequately treat the waters to be discharged, plus any other information required by the Division. Notices of the proposed permit issuance shall be published in a local newspaper of general circulation. At least 30 days following the date of public notice will be allowed by the Division for public comment (Rule 33-16-01-07). The Division shall hold a public hearing if it determines there is sufficient public interest. A decision to approve or deny a permit is made following the comment period and hearing.

An NDPDES permit is valid through its expiration date, subject to modification or revocation for cause.

Program Description:

The operator shall monitor the flow rate and quality of effluent or pollutants according to the conditions specified in the permit. Records shall be retained for at least three years.

Monitoring results shall be reported to the Department in accordance with a reporting schedule prescribed in the permit, but in no case less than on an annual basis, and shall be on NDPDES prescribed forms.

Any spill or discharge of waste which causes, or is likely to cause, pollution of state waters must be reported immediately to the Division, providing all relevant information about the spill. Depending on the nature and volume of accidental discharge, the Division may require the operator to take immediate remedial measures or any other necessary action.

Enforcement:

Any person who violates these laws or any permit conditions shall be punished by a fine of not more than $25,000 per day of violation, or by imprisonment in the county jail for not more than one year, or both. Ref. NDCC 61-28-08.

NORTH DAKOTA

UNDERGROUND INJECTION CONTROL

Agency in Charge:

Oil and Gas Division
North Dakota Industrial Commission
600 East Boulevard
Bismarck, North Dakota 58502-0840
701/224-2969

Key Laws or Regulations:

North Dakota Century Code, Chapter 38-08; North Dakota Administrative Code, Chapter 43-02-03; Underground Injection Control; NDAC 43-02-05.

Permits Required:

UIC permit.

No underground injection may be conducted without obtaining a permit. Application for a permit shall be made on forms provided by the Commission, and shall be submitted to the Commission at least 30 days prior to a hearing before that body.

Information to be provided by the applicant is outlined in NDAC Chapter 43-02-05-04.

The Commission may issue a permit on an area basis or for each well, provided that the permit is for injection wells:

a) Described and identified by location if they are existing wells;
b) Within the same field, facility, reservoir, project, or similar unit in the same state;
c) Of similar construction;
d) Of the same class;
e) Operated by a single owner or operator.

A UIC permit is valid for the life of the project unless it is revoked or suspended for cause.

Program Description:

Prior to commencing operations, the operator of a new injection well must demonstrate the mechanical integrity of the well. All injection wells must demonstrate mechanical integrity at least once every five years (NDAC Chapter 43-02-05-07).

The operator of an injection well shall monitor injection pressure, volume and makeup of fluid(s) injected, and shall report monthly to the Division. Records shall be retained for at least three years.

The operator shall conduct such monitoring and sampling, and maintain such other information as the Commission may require (NDAC Chapter 43-02-05-12).

Any noncompliance with regulations or permit conditions shall be reported orally to the enforcement officer within 24 hours followed by a written report within five days.

Enforcement:

An injection well with mechanical failure may be shut in per request of the Division. Any person who violates any provision of this chapter (Chapter 38-08 NDAC), or any rule, regulation, or order of the Commission is subject to a civil penalty to be imposed by the Commission not to exceed $12,500 for each offense, and each day's violation is a separate offense.

NORTH DAKOTA

HAZARDOUS WASTE

Agency in Charge:	Environmental Engineering Division State Dept. of Health & Consolidated Laboratories 1200 Missouri Avenue, P.O. Box 5520 Bismarck, North Dakota 58502-5520 701/221-5188
Key Laws or Regulations:	North Dakota Century Code, Chapter 43-02-03; 40 CFR 270; Resource Conservation and Recovery Act (RCRA).
Permits Required:	Owners or operators of surface impoundments such as mud pits, surface waste storage must have permits if those facilities are to be operated on site for more than 90 days and accumulates more than 55 gallons of hazardous waste or one quart of acutely hazardous waste listed in 40 CFR 261.33(e). Permitting conditions are the same as contained in 40 CFR 270.
Enforcement:	If, after completion of the administrative hearing process, the department determines that a violation of this chapter, or any rule, regulation, or order of the department issued under this chapter, has occurred, it shall make all of its evidence and findings available to the attorney general for use in any including an action for injunctive relief. Any person who willfully violates this chapter or any permit condition or limitation implementing this chapter shall be punished by a fine of not more than twenty-five thousand dollars per day of violation, or by imprisonment in the county jail for more than one year, or by both such fine and imprisonment. Upon the conviction of such

person under this subsection, punishment shall be by a fine of not more than fifty thousand dollars per day of violation, or by imprisonment in the county jail for not more than two years, or by both such fine and imprisonment.

Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained under this chapter, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this chapter, shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment in the county jail for not more than six months, or by both such fine and imprisonment.

Any person who violates this chapter, or any permit condition of limitation implementing this chapter, and any person who violates any order issued by the department, shall be subject to a civil penalty not to exceed ten thousand dollars per day of such violation.

DOE–EOR Regulations

OKLAHOMA

AIR POLLUTION

Agency in Charge:

Air Quality Service - 0201
Oklahoma State Department of Health
1000 N.E. 10th Street, P.O. Box 53551
Oklahoma City, OK 73117-1299
405/271-5220

Key Laws or Regulations:

Oklahoma Clean Air Act, 63 Oklahoma Statute, with amendments effective through December 1990; Oklahoma Air Pollution Control Regulations.

Permits Required:

Oklahoma operates a dual permit system (AQS Rule 1.4).
(1) A construction permit must be obtained prior to commencement of construction, installation, or modification of a source. (2) Application for an operating permit shall be filed within 60 days after start-up.

Separate permits are mandatory for each source for which a permit is required within an EOR facility. Permit applications shall be prepared on forms supplied by the Commissioner. Supplemental data shall be attached to application forms.

Construction permits are terminated if construction is not commenced within 18 months after the permit issuance date unless an extension is granted by the Commissioner [Sect. 1.4.2(g)].

Any application for a permit shall contain, as the Commissioner determines appropriate, an evaluation of ambient air quality in that area that the source would affect prevention of significant deterioration (PSD) as provided in Sect. 1.4.4 of AQS Regulations. Construction permit applications shall include a description of a

system for monitoring air quality and, if the Commissioner deems appropriate, best available control technology (BACT) to be installed to control the discharge of air pollutants.

The time required from an application to issuance date can vary from 3 to 18 months depending on the completeness of the application.

Program Description:

All excess emissions caused by malfunction, shutdown, start-up or maintenance shall be reported (AQS Rule 1.5). The operator shall notify the Chief of Air Quality Service as soon as practical during normal office hours, no later than the next working day.

As soon as possible thereafter, within ten (10) business days, further report shall be tendered in writing. Data to be included in written reports varies according to the cause for the discharge. These are specified in AQS Sect. 1.5(d), 1.5(e), and 1.5(f).

The Commissioner may require the owner or operator of any air contaminant source to install, use, and maintain monitoring equipment (AQS Rule 5.1).

Records and reports may be required to be recorded, compiled and submitted on forms furnished by the Commissioner as follows:
SO_2 and NO_x emissions data - daily records, monthly summaries, reported biannually.
Particulate matter - sampled and reported biannually.

Visible emissions - measured continuously, daily records, reported biannually.

Emissions Limits:

The discharge of particulate matter is governed by AQS Rule 2.4 and AQS Rule 3.1, 3.2 and 3.3. Emission into the open atmosphere resulting from combustion of fuel in any fuel burning equipment is prohibited in quantities in excess of that indicated below:

Input (Million Btu/Hr)	Maximum Allowable Emissions (Lbs/Million Btu)
≤ 10	.60
10 < 100	.35
100 < 1,000	.20
≥ 10,000	.10

No operator shall permit the visible emission of particulate matter, smoke, vapors, and/or other air contaminants which will cause a shade or density greater than 20% equivalent opacity, a condition of air pollution.

SO_2: [AQS Rule 3.4, Sect. 3.4 (c) (1)(B)(i)]
0.2 lb/million Btu from new gas fuel burning equipment.
0.8 lb/million Btu from new liquid fuel burning equipment
1.2 lb/million Btu from new solid fuel burning equipment

NO_x: [AQS Rule 3.5, Sect. 3.5 (b)(l)]
0.2 lb/million Btu from new gas fuel burning equipment with rated heat input ≥ 50 MM Btu/hour
0.3 lb/million Btu from new liquid fuel burning equipment with rated heat input ≥ 50 MM Btu/hour
0.7 lb/million Btu from new solid fuel burning equipment with rated heat input ≥ 50 MM Btu/hour

Organic materials: [AQS Rule 3.7, Sect. 3.7.4 (b)(l)]
No operator shall cause or allow the emission of hydrocarbons or other organic materials from any fuel burning equipment.

Enforcement:	Violators of the Oklahoma Clean Air Act or its regulations are subject upon conviction to a county jail term for not more than one (1) year, or a fine of not more than $10,000, or both. Each day or part of a day during which violation occurs shall constitute a separate offense.
Other Considerations:	The Federal Clean Air Act of 1990 will cause some changes to be enacted in the Oklahoma Clean Air Act beginning after November 1992. The changes will primarily concern the discharge of certain chemicals to the atmosphere by EOR operators within SMSA's of 1 million or more people. Major source operating permits will be revisited every five years.

OKLAHOMA

WATER POLLUTION

Agency in Charge:

Water Quality Division
Oklahoma Water Resources Board
600 North Harvey, P.O. Box 150
Oklahoma City, OK 73101
405/231-2500

Key Laws or Regulations:

Pollution Remedies Act, 82 O.S. 1981, Sect. 926.1 et seq.; Federal Clean Water Act, 33 U.S.C., Sect. 301 et seq; U.S. Environmental Protection Agency NPDES program; Oklahoma Water Quality Standards promulgated by the Oklahoma Water Resources Board (OWRB); Rules, Regulations and Modes of Procedure 1990 - Chapter X, Pollution Remedies, publ. by OWRB.

Permits Required:

NPDES permit from the EPA. Waste water discharge permit from the Oklahoma Water Resources Board.

Applications for waste water disposal permits are made to the Board (OWRB Rule 1020.1). Persons planning to construct an EOR facility shall obtain a permit [OWRB Rule 1020.2 (C)].

Operators must file typed applications for construction permits on forms provided by the Board (OWRB Rule 1025.1). Applications should be filed at least 120 days prior to initiating construction of the site or for modifying an existing wastewater disposal system.

Information that is needed to be supplied to the Board by all EOR construction permit applicants is described in OWRB Rules 1025.4 and 1025.6.

A regular waste disposal permit is issued for a period of five years and may be renewed upon written application to the Board. Application for permit renewal shall be submitted at least 90 days before the expiration date.

Program Description:

Oklahoma regulations are presently administered in accordance with the EPA NPDES program under the Department of Health and/or the Corporation Commission. The OWRB is working to wholly comply with EPA NPDES regulations. It targeted a change to bring the entire program within its control by October, 1992.

Waste water disposal sites may be visited by Board inspectors at any time during the application/ permit period (OWRB Rule 1045.4).

Operators shall retain records of all monitoring and other data used to complete application for a permit for at least 3 years on forms provided by the Board. Self monitoring, records keeping and reporting are to be done routinely throughout the life of the permit. Details of reporting requirements are contained in OWRB Rule 1045.5. Analysis must be done by a certified laboratory.

If the permittee does not comply with maximum effluent limitations specified in the permit he shall notify the Board, in writing, within 5 days of becoming aware of it. He shall describe the discharge, cause for noncompliance, period of noncompliance, steps being taken to correct the noncomplying discharge and the estimated time noncompliance will have been eliminated or mitigated.

Whenever a reportable accidental spill or discharge occurs, the operator shall immediately initiate steps to clean up the site, and shall simultaneously notify the Board, followed by a letter of explanation within one week.

Notification of reportable accidental spills or discharges are governed by 40 CFR, Part 117.

Enforcement:

Penalties and remedies for violations shall be governed by the applicable and relevant laws of the State of Oklahoma with particular but not inclusive respect to the provisions of 82 O.S. Sect. 926.1 through 926.13.

OKLAHOMA

UNDERGROUND INJECTION CONTROL

Agency in Charge:	Underground Injection Department Oklahoma Corporation Commission Jim Thorpe Building 2101 North Lincoln Boulevard Oklahoma City, OK 73105 405/521-2500
Key Laws or Regulations:	Oklahoma Corporation Commission Oil and Gas Rules R1-506, R3-300 through R3-313, R5-100 through R5-103, R5-200.
Permits Required:	An enhanced recovery project shall be permitted only by order of the commission after notice and hearing (R3-301 through R3-303). Application required for each well to be used as an injection well or disposal well (R3-304). They shall remain valid for the life of the well unless they are revoked for non-compliance or the well is voluntarily terminated.
Program Description:	Enhanced recovery injection wells and disposal wells shall be tested and monitored (R3-305, R3-306). They include: initial mechanical integrity test and once every 5 years thereafter; or after the initial test monitoring and recording the injection rate, volume and casing-tubing annulus pressure monthly, reporting the results to the Conservation Division by the first day of April the next calendar year on Form 1075. Semi-annual reports required beginning within 30 days of commencement of operations for all wells on Forms 1012 and 1072 (and in January and July thereafter), plus annual fluid injection report (Form 1012A) submitted to the Conservation Division by April 1st each year.

If an operator voluntarily terminates injection into a well, he shall notify the Conservation Division within 30 days after the termination date.

Enforcement:

Failure to file initial reports, semi-annual reports and annual reports will result in prohibition of the use of a well as an EOR injection well or disposal well (R3-306).

The Conservation Division may order an administration shutdown if a mechanical failure or down-hole problem occurs.

OKLAHOMA

HAZARDOUS WASTE

Agency in Charge:	Hazardous Waste Management Service Oklahoma State Department of Health 1000 N.E. 10th Street, P.O. Box 53551 Oklahoma City, OK 73152 405/271-7047
Key Laws or Regulations:	Oklahoma Controlled Industrial Waste Disposal Act, 6.3 O.S. 1981, Sections 1 - 2001 et seq. as amended; ODH Bulletin 0525; Code of Federal Regulations (CFR 40, Parts 124, 144, 146, 260, 261, 262, 264, 265, 270).
Permits Required:	Under 40 CFR 261.4; "Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy", are materials which are not considered to be hazardous wastes. No hazardous waste permit may be required for drilling muds and/or wastewater discharge pits unless the wastewater discharge pits unless the wastewaters are secondarily processed for oil recovery. However, any waste chemicals, e.g. degreasing solvents, are likely to be RCRA regulated.

TEXAS

AIR POLLUTION

Agency in Charge:	Texas Air Control Board 6330 Highway 290 East Austin, TX 78723 512/451-5711
Key Laws or Regulations:	Texas Health and Safety Code; Texas Clean Air Act, Regulations I, Ii, VI, VIII, IX, X, Texas Air Control Board (TACB) Enforcement Rules.
Permits Required:	No permit is required if total actual emissions from the proposed facility shall not exceed 250 tons per year of CO or NO_x or 25 tons per year of any other contaminant except CO_2, H_2O, N_2, CH_4, CH_3, H_2, O_2 unless at least one facility at such property has been subject to public notification and comment as required (Reg. VI, Rule 116.6 and 116.10). No permit is required if a numbered standard exemption is satisfied along with TACB Reg. VI, Rule 116.6. Unless the facility satisfies a specific numbered standard exemption, a permit is required. An EOR operator proposing to construct or modify a facility that will not qualify for exemption will need to obtain a construction permit and an operating permit [Reg. VI, Rules 116.1, 116.3(a), 116.6, 116.3(b)]. TACB provides Form PI-1 to be completed by a person applying for a construction permit. In addition to completing Form PI-1, the applicant will need to attach several supporting documents, and will have to publish notice of intent to construct, subject to Texas Clean Air Section 382.056 and TACB Reg. VI, Rule 116.10.

Within 90 days of receiving a construction permit application the applicant will be notified that the application is either complete or deficient. If the application is deficient the applicant is told what additional information is required and has up to 60 days to provide it. If or when the application is complete, the Executive Director of TACB will require the applicant to conduct public notice of the proposed construction provided a preliminary decision was made to issue the permit.

In order to be granted a construction permit the applicant must demonstrate that the facility will comply with all TACB regulations as outlined in Reg. VI, Rule 116.3 and EPA's 40 CFR 52.21 and 51.301 PSD Air Quality Regulations.

Within 180 days of receipt of a completed application, provided ----

(A) No request for a public hearing on the proposed facility was received in response to public notice;

(B) All public notification requirements were satisfied;

(C) Federal PSD regulations don't apply

--- the Executive Director of TACB will notify the applicant of his final decision to grant or deny the permit [Reg. VI, Rule 116.10(c)].

A permit to operate is granted by filing application and the operator has demonstrated that the facility has been constructed in accordance with terms of the construction permit and that it is complying with the rules and regulations of TACB and the Texas Clean Air Act. It can take about one month to get an operating air quality permit if all the required information is on the application, and depending on TACB workload. Several months may be required if the workload is heavy.

The operating permit is valid for 15 years following issuance or continuation of the permit.

Program Description:

Visible emissions of particulate matter shall not exceed 20% opacity (Reg. I, Chapter 111.111) over a six minute period. For new and modified sources, visible emissions are typically limited to 5% opacity.

Solid fuel burning steam generators shall not permit emissions of particulate matter to exceed 0.03 pound per million Btu heat input.

Oil or gas fired steam generators with a heat input greater than 2500 million Btu per hour shall not permit emissions of particulate matter to exceed 0.03 pound per million Btu heat input.

SO_2: Solid fuel fixed steam generator --- no more than 0.2% (W) in No. 2 fuel and 0.3% (W) in No. 6 fuel.

H_2S: Maximum 0.12 ppm off property concentration, decreasing to 0.08 ppm in residential areas.

NO_x: For all new and modified combustion units is 0.03 pound per million Btu heat input.

Exemptions

Internal combustion and gas turbine driven used only for portable, emergency and/or standby service.

Liquid loading and unloading equipment provided that no visible emissions result and the materials being handled are limited to those contained in the standard exemption list (Art. 51).

Tanks, separators, heaters, gunbarrels, other oilfield recovery units, provided total emissions don't exceed 25 tons per year.

Temporary separators, tanks, meters and fluid handling equipment used for less than 90 days (Ref. Art. 67 in the standard exemption list).

Smokeless gas flares which meet standard exemption list criteria (Art. 80).

Note: Most of the above items must be registered with the appropriate TACB Regional office using Form P1-7.

Compliance:

Whenever the Executive Director determines emissions from one or more sources are causing localized imminent danger to human health or safety, he shall order the person responsible for the emissions to reduce or discontinue the emissions immediately (Regulations VIII, Chapter 118.3).

If an apparent violation will not materially affect human health or safety, the Executive Director may proceed to institute an enforcement action (Enforcement Rule 105.11).

If an apparent violation is of a permit and is continued after 180 days following notice of violation, the Executive Director may initiate proceedings to revoke the permit.

Enforcement:

If the Executive Director determines that it is appropriate to institute administrative proceedings, he will issue a report to the Board (TACB) and recommend the penalty.

Penalties can include:

1. Fine up to $10,000 per day for each violation.
2. Revocation of permit.
3. Criminal proceedings.

Texas Air Control Board
Air Quality Control Regions

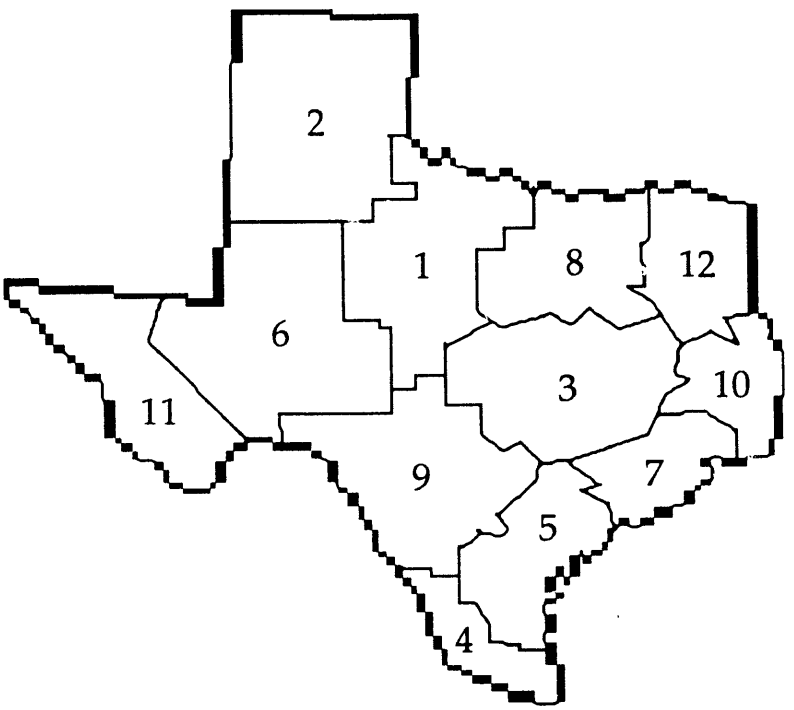


FIGURE NO. 6

TEXAS AIR CONTROL BOARD
REGIONAL OFFICES
EFFECTIVE DECEMBER 1, 1990

REGION 1
Winona L. Henry, P.E., Director
Commerce Plaza Office Building
1290 South Willis, Suite 205
Abilene, Texas 79605
(915) 698-9674 TX-AN 840-1160

REGION 2
Gerald Hudson, P.E., Director
Briercroft South #1
5302 South Avenue Q
Lubbock, Texas 79412
(806) 744-0090 TX-AN 862-0053
744-6055

REGION 3
Eugene Fulton, Director
500 Lake Air Drive, Suite 1
Waco, Texas 76710
(817) 772-9240 TX-AN 820-1112
772-9241 820-1118

REGION 4
Robert Guzman, Director
Matz Building, Room 204
513 East Jackson
Harlingen, Texas 78550
(512) 425-6010 TX-AN 820-1803

REGION 5
Tom Palmer, P.E., Director
1231 Agnes Street, Suite 103
Corpus Christi, Texas 78401
(512) 882-5828 TX-AN 820-1108
882-5829

REGION 6
Charley Sims, Director
1901 East 37th Street, Suite 101
Odessa, Texas 79762
(915) 367-3871 TX-AN 840-1115
367-3872

REGION 7
Jodena Henneke, Acting Director
5555 West Loop, Suite 300
Bellaire, Texas 77401
(713) 666-4964 TX-AN 850-1330
850-1331

REGION 8
Melvin Lewis, Director
6421 Camp Bowie Blvd., Suite 312
Fort Worth, Texas 76116
(817) 732-5531 TX-AN 831-5593
732-5532 831-5594

REGION 9
James Menke, Director
4335 Piedras West, Suite 101
San Antonio, Texas 78228
(512) 734-7981 TX-AN 820-1220
734-7982

REGION 10
Vic Fair, Director
4605-B Concord Road
Beaumont, Texas 77703
(409) 838-0397 TX-AN 850-1422
838-0398 850-1423

REGION 11
Manuel Aguirre, P.E., Director
1200 Golden Key Circle, Suite 369
El Paso, Texas 79925
(915) 591-8128 TX-AN 846-8137
591-8129

REGION 12
Richard Leard, P.E., Director
1304 South Vine Avenue
Tyler, Texas 75701
(903) 595-2639 TX-AN 831-5487

TEXAS

WATER POLLUTION

Agency in Charge:	Oil and Gas Division Railroad Commission of Texas 1701 North Congress Street, P.O. Box 12967 Austin, TX 78711-2967 512/463-6893
Key Laws or Regulations:	House Bill 2005 (1983); Rule 8 (amended through December 1, 1987); House Bill 1407 (1981); Texas Water Codes, Sect. 26.13(b); Federal Water Quality Act (1987).
Permits Required:	NPDES permit (EPA issued) and state issued discharge permit. A permit is required to maintain or use a pit for storage or use of brines or other mineralized waters. It may only be issued if the Texas Railroad Commission (TRRC) determines that the use of the pit cannot cause pollution of surrounding productive agricultural land nor pollution of surface or subsurface water. Historically, no form has existed for making application for a state disposal permit. Application has been by letter of request, containing the following: 1. A complete description of the source; 2. Analysis of produced water; 3. Plat showing location of proposed discharge; 4. Facility design and proposed operations details. Discharge permit conditions are described in Rule 8, Sect. (d) (6) and Appendix C of the Water Protection Manual.

Applicants are required to use Form H-11 when requesting permit to construct collecting pits and skimming pits associated with discharge (Water Protection Manual Chapter V and Rule 8).

Applications for permits to maintain or use pits to dispose of oil and gas wastes are filed with the TRRC in Austin. Applications are for projects, defined as one or more wells. Each well must be identified, and wells not in projects but within 1/4 mile must also be identified.

Notice of application must be simultaneously (or sooner) filed with surface owners of the tract on which the pit will be located or upon which disposal will take place. The applicant shall also give notice to the appropriate municipal official if the site is inside incorporated city or town limits, or if the discharge point is within 1/2 mile of waterfront tracts excluding the Gulf of Mexico and its bays.

If no protests are received within 15 days after filing of an application the Director may elect to hold a hearing or proceed to grant the permit.

The Railroad Commission usually passes some parts of a discharge permit application to the Texas Water Commission for their review and approval before granting a permit. It normally takes 45-60 days from application filing date to the grating of a permit if the application is complete.

A discharge permit is normally valid for the life of the facility unless it is modified, or is suspended or terminated by TRRC for cause after notice and an opportunity for hearing.

Note: The NPDES permit must be obtained from the Federal Environmental Protection Agency until the TRRC obtains primacy. The NPDES permit is required in addition to the state discharge permit.

Program Description:

An operation may maintain or use reserve pits, mud circulation pits, completion/workover pits, flare pits or fresh water pits without discharge permit under the following conditions specified by Rule 8:

Deposits into a reserve pit or mud pit shall be limited to:

1. Drilling fluids;
2. Drill cuttings, sand and silts separated from circulating drilling fluids;
3. Wash water for cleaning drill pipe and other equipment at the wellsite;
4. Drillstem test fluids;
5. Blowout preventer test fluids.

Operators are responsible for dewatering, back-filling and compacting reserve pits and mud pits in accordance with [Rule 8(d)(4)] when terminating operations.

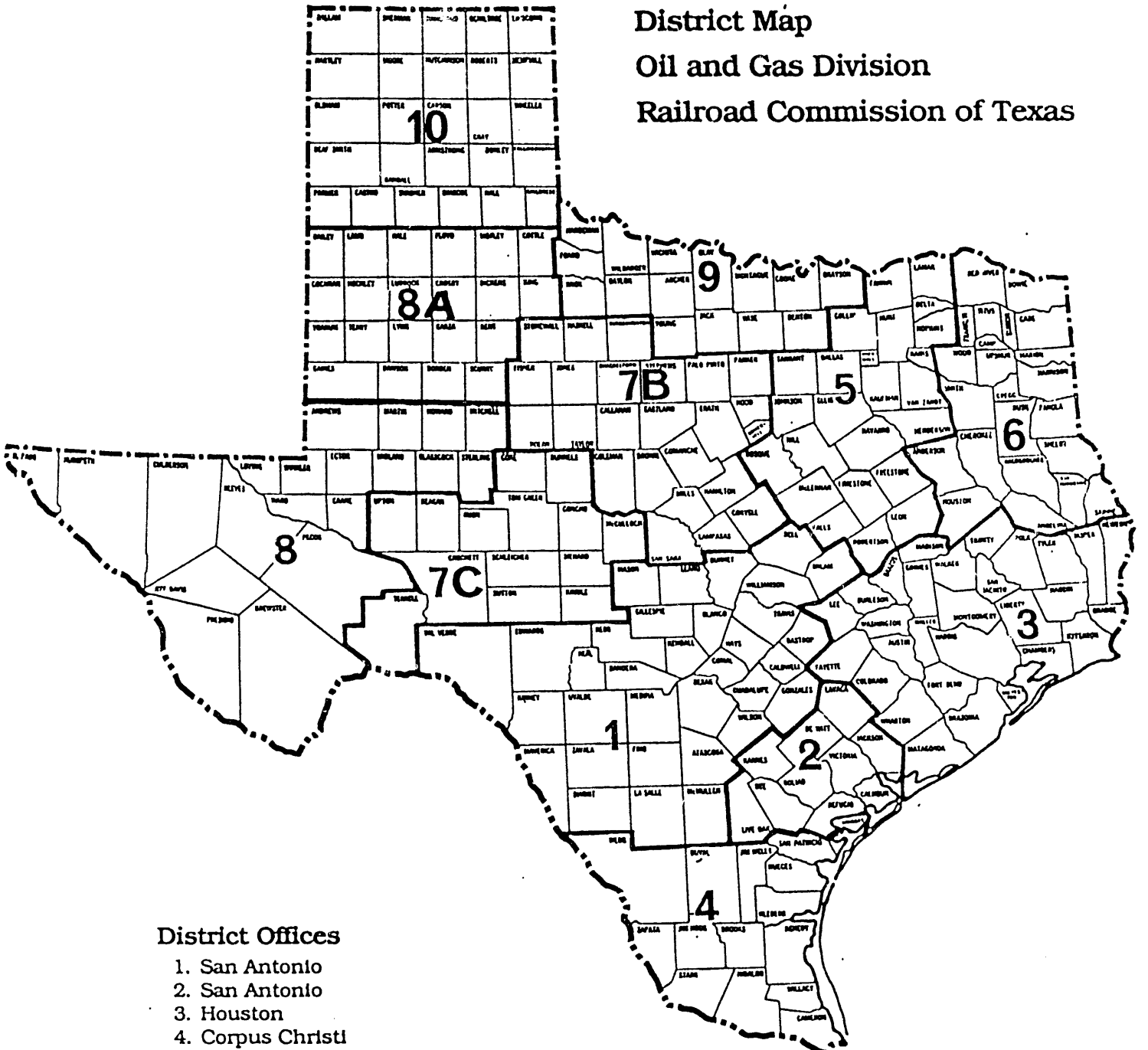
Enforcement:

The Railroad Commission can modify, suspend or terminate a permit if:

a) Pollution of surface or subsurface water is occurring or is likely to occur as a result of their permitted operation;
b) Waste of oil, gas or geothermal resources is occurring or is likely to occur as a result of the permitted operation;
c) The permittee violated the terms and conditions of his permit;
d) A material change of conditions has occurred in the permitted operations.

Other Considerations:

The Texas Railroad Commission has applied to the Federal E.P.A. for gaining primacy on issuing NPDES permits. Some changes in their permitting regulations are anticipated when primacy is attained.



District Offices

1. San Antonio
2. San Antonio
3. Houston
4. Corpus Christi
5. Kilgore
6. Kilgore

7B. Abilene

7C. San Angelo

8. Midland

8A. Lubbock

9. Wichita Falls

10. Pampa

FIGURE NO. 7

District Offices and Directors

Districts 1 & 2 San Antonio 78205-1689	Thomas R. Melville, District Director Patrick Mendoza, Assistant District Director 1610 Milam Building	(512) 227-1313 FAX (512) 227-4822
District 3 Houston 77040-6008	Guy Grossman, District Director Gil Bujano, Assistant District Director 13201 Northwest Freeway, Suite 701	(713) 460-0631 FAX (713) 690-7630
District 4 Corpus Christi 78460-0307	Fermin Munoz, Jr., District Director Bernard C. Eikel, Assistant District Director P. O. Box 10307	(512) 242-3113 FAX (512) 242-2101
Districts 5 & 6 Kilgore 75662-5998	Randy Earley, District Director Carl Gardner, Assistant District Director 619 Henderson Blvd.	(214) 984-3026 FAX (903) 983-3413
District 7B Abilene 79604-1681	Jose S. Mayorga, Jr., District Director Joe Cress, Assistant District Director One Energy Square, Ste. 6-B 241 Pine, P. O. Box 1681	(915) 677-3545 FAX (915) 677-7122
District 7C San Angelo 76902-2141	Randall Ross, District Director Thomas W. Oren, Assistant District Director 110 S. Taylor, P. O. Box 2141	(915) 942-8393 FAX (915) 949-3799
District 8 Midland 79702-2110	Mark Henkhaus, District Director Charlie Ross, Assistant District Director 2509 N. Big Spring, P. O. Box 2110	(915) 684-5581 FAX (915) 682-1325
District 8A Lubbock 79452-2089	Karl Thiel, District Director Barry Wood, Assistant District Director 405 50th Street, P. O. Box 12089	(806) 744-6944 FAX (806) 744-7860
District 9 Wichita Falls 76301-6798	Fred McNeel, District Director Walter Q. Gwyn, Assistant District Director First Texas Building 901 Indiana Ave., Suite 600	(817) 723-2153 FAX (817) 723-5088
District 10 Pampa 79066-0941	Bob G. Blakeney, District Director Assistant District Director Municipal Building 201 W. Foster, P. O. Box 941	(806) 665-1653 FAX (806) 665-4217

TEXAS

UNDERGROUND INJECTION CONTROL

Agency in Charge:	Oil and Gas Division Railroad Commission of Texas 1701 North Congress Street, P.O. Box 12967 Austin, TX 78711-2967 512/463-6790
Key Laws or Regulations:	Texas Water Code, Chapter 27, Statewide Rule 9; Statewide Rules 46 and 74; Title 3, Texas Natural Resources Code.
Permits Required:	UIC permit for disposal, fluid (Class II) injection and hydrocarbon storage wells, issued by the Railroad Commission. Application shall be filed by the operator with the Commission in Austin and with the appropriate district office on the same date. Use form W-14 for disposal wells; forms H-1 and H-1A (plus form H-7 if fresh water is to be injected) for Class II wells; form H-4 for hydrocarbon storage wells. Before approval can be considered for a disposal well, applicant must submit a letter from the Texas Water Commission stating that the use of such formation won't endanger fresh water strata and that the formations to be used for disposal are not fresh water bearing [3.9 Rule 9 (b), (c)]. Applicants must provide information on the depth and status of wells within 1/4 mile radius. Abandoned wells shall have been plugged in a manner that will prevent movement of fluids from one zone to another or the applicant may show proof that a lessor area will be affected by injection.

Applicants shall give notice to the surface owner of the tract on which the well is located, to adjoining offset operators, to local county and city clerks or other appropriate officials, by mailing or delivering copies of the application on or before the date the application is filed with the Commission. Notice of the application shall also be published [3.9 Rule 9 (d); 3.46 Rule 46 (c); 3.47 Rule 74 (d)].

If no protest is received by the Commission within 15 days of receipt of the application and/or proof of publication, the Director may elect to hold a hearing or to administratively approve the application.

UIC permits may be modified, suspended or terminated by the Commission for just cause and opportunity for hearing if:

a) A substantial change of conditions occurs in the operation or completion of the well or there are substantial changes in the information originally furnished;
b) There are substantial violations of the terms and provisions of the permit or of Commission rules;
c) The applicant misrepresented material facts in the permit issuance process;
d) Fresh water is likely to be polluted as a result of continued operation of the facility;
e) Injected fluids or gases are escaping from the permitted injection zone.

Once a permit is granted, it is valid for the life of the project unless the Commission modifies, suspends or terminates it, or if well ownership if transferred.

It should normally take 45-60 days from application date to the granting of an administratively issued permit. Fluid injection and hydrocarbon storage applications are for projects, defined as one or more wells, but each well must be identified. Disposal well applications are for a single well permit.

Program Description:

Before the operator of a Class II injection well can begin injection operations, a mechanical integrity test must be performed. The test must be repeated at least once every five years afterward in accordance with [3.9 Rule 9(k); 3.46 Rule 46 (j)], using form H-5 to report test results to the Commission.

The operator shall monitor injection pressure and rate of each Class II well on at least a monthly basis. Results shall be reported annually to the Commission on form H-10.

Any significant pressure changes or other monitoring data indicating the presence of leaks shall be reported to the appropriate district office within 24 hours, followed by a written report within five working days. All monitoring records shall be retained by the operator for at least five years.

Enforcement:

Violations of these rules may subject the operator to penalties specified in Chapter 27 of the Texas Water Code and Title 3 of the Natural Resources Code.

The certificate of compliance for any oil, gas, geothermal or hydrocarbon storage well may be revoked in the manner prescribed in Art. 3.68 (Rule 73) for violation of these rules.

TEXAS

HAZARDOUS WASTE

Agency in Charge:

Oil and Gas Division
Railroad Commission of Texas
1701 North Congress Street, P.O. Box 12967
Austin, TX 78711-2967
512/463-6790

Note:

The Texas Solid Waste Disposal Act and the Texas Industrial Solid Waste Regulations of the Water Quality Board expressly exclude from their coverage disposal of materials resulting from "activities associated with" the production of oil and gas. These are under the jurisdiction of the Railroad Commission. Rule 8 or the Railroad Commission's Rules Having Statewide General Application contains several provisions relating to solid waste disposal.

UTAH

AIR POLLUTION

Agency in Charge:

Utah Bureau of Air Quality
Utah Department of Health
P.O. Box 16690
Salt Lake City, Utah 84116-0690
801/538-6108

Key Laws or Regulations: Utah Administrative Code; Utah Air Conservation Regulations; Federal EPA Regulations.

Permits Required: Construction permit.

Any person planning to construct, install or modify an installation which will or might become a source or an indirect source of air pollution shall submit to the Executive Secretary a notice of intent.

The notice of intent shall contain the following information:

a. A complete description of the facility;
b. Construction schedule;
c. Operating schedule;
d. Plans, specifications and related information;
e. Expected composition and characteristics of the effluent stream;
f. Size, type and performance characteristics of air cleaning devices;
g. All other information that may be required under R446-1-3.1.6.

Prior to issuing an approval or disapproval order, the Executive Secretary shall advertise his intent in a newspaper of general circulation in the locality of the proposed project. Copies shall be

sent to the applicant, Federal EPA, state and local officials having cognizance over the location. A 30 day period is allowed for public comment. If requested within 15 days after publication of the notice, a hearing will be held in the area of the proposed installation.

Whenever the Executive Secretary determines that all requirements have been met, he may issue an order authorizing construction. Approval orders are reviewed 18 months after the date of issuance. If the project is not proceeding according to plan, the Executive Secretary may revoke the permit.

The Executive Secretary shall issue an approval order if he determines that the new or modified source would produce emissions not exceeding 50 tons per year of any combination of PM_{10}, SO_x, or NO_x, and that pollution control equipment is BACT.

A permit is considered valid for the life of the project unless it is modified, transferred, revoked or terminated.

Program Description:

New sources shall be tested within six months after start-up. At least 30 days prior to conducting any emission test required under any part of these regulations, the operator shall notify the Executive Secretary of the date, time and place of the test (Ref: R446-1-3.4).

The operator of a stationary source which emits at least 25 tons per year of any air contaminant must conduct an emission test at least once every three years thereafter, or as often as deemed necessary by the Executive Secretary.

The operator of a major stationary source of air pollution (100 tons per year or more of any air contaminant) is required to conduct emission tests on an annual basis.

All sources with established emission limitations shall conduct emissions testing at least once every

five years. For sources in non-attainment areas, testing may be required more frequently.

Visible emissions from installations constructed after April 25, 1971, except internal combustion engines or any incinerator, shall be of a shade or density no darker than 20% opacity for no more than three minutes in any hour (Ref.: R446-1-4.1).

An operator of a fossil fuel fired steam generator (250 million Btu/hour heat input) shall install a continuous emission monitoring system. He shall file quarterly compliance reports. Annual operational audit checks shall be done on those systems, or more frequently if required by the Executive Secretary (R446-1-4.6).

All continuous monitoring data shall be kept by the source for a minimum period of two years after the date on which emissions occurred.

Excessive emissions resulting from unavoidable equipment failure or procedural error will not be deemed a violation of these regulations. However, such breakdowns must be reported immediately -- within four hours if possible but in no case less than 24 hours -- to the Executive Secretary. Within five days of the beginning of the incident a written report shall be submitted to the Executive Secretary (R446-1-4.7).

Failures caused by poor maintenance, careless operation, or any other preventable upset condition shall not be considered unavoidable breakdowns.

The operator of an installation suffering an unavoidable breakdown of equipment or procedural errors shall take measures to reduce excess emissions as soon as possible without jeopardizing equipment or safety of the installation or facilities.

Failure to comply with these procedures and curtailment actions shall constitute a violation of these regulations.

Enforcement:	Violations of these regulations are subject to penalties of amounts ranging from $2,000 to $10,000 per day for each violation, based on the potential for harm plus the nature and intent of the violations (R446-4-2).
Other Conditions:	Companies that intend to submit a notice of intent must consult Utah Air Conservation Regulations, the State Implementation Plan, 40 CFR Part 60 and 40 CFR Part 61. They should also read the Utah Division of Air Quality recently developed guide entitled "Preparation and Assessment of a Notice of Intent, a Methodology", published December 11, 1990.

UTAH

WATER POLLUTION

Agency in Charge:	Utah Department of Environmental Quality Division of Water Quality State of Utah Salt Lake City, Utah 84114-4870 801/538-6146
Key Laws or Regulations:	The Oil and Gas Conservation Act, Utah Code Ann. 40-6-5; R615-9 Disposal of Produced Water; Water Pollution Control Act.
Permits Required:	Construction permit; UPDES permit. Application for disposal of produced water into a lined pit shall include a complete description of the site: 1. Topographic map and drawing including pit dimensions, slopes, leak detection system and location relative to other site facilities; 2. Maximum daily water quantity to be disposed of, including water analysis and information regarding major constituents; 3. Climatological data; 4. Method and schedule for disposal of precipitated solids; 5. Method for controlling and disposing of any liquid hydrocarbon accumulation; 6. Engineering data and design criteria; 7. Type and thickness of liner material; 8. Description of leak detection system; 9. Proposed procedures for repair of liner should leakage occur (Ref. R615-9-5-1.2.6).

Application for disposal of produced water into an unlined pit shall include:

1. Topographic map and drawing, specifications, etc., prepared by an engineer licensed in Utah;
2. Daily quantity of water to be disposed of, a representative water analysis;
3. Climatological data;
4. The estimated percolation rate based on soil characteristics under and adjacent to the proposed pit;
5. Estimated depth and areal extent of any USDW in the area and an indication of any effect of the produced water with any water resources present;
6. If beneficial use is to be made, written confirmation from the user;
7. If application avers surface and subsurface waters will not be affected by disposal in an unlined pit ---
   a) A map showing location of surface waters, water wells and existing water disposal facilities within one mile;
   b) Weighted average concentration of TDS of all surface and subsurface waters within one mile radius that might be affected by the proposed disposal.
8. Any hydrological evidence showing that the proposed disposal method will not adversely affect existing water quality (Ref. R615-9-5-3.-3.7.3).

Surface disposal into unlined pits is allowed if the wastewater contains less than 5,000 mg/l TDS and if the wastewater does not contain objectionable or toxic levels of any material as indicated by chemical analysis. However, this requirement is waived for sites discharging less than five barrels per day.

A condition for approval for construction of a produced water disposal pit includes that the owner shall furnish a bond to the state that the facility will be maintained and operated so as not to cause pollution.

If the application is complete and in order, approval to construct will be issued within 30 days from receipt of the application. Permits are valid for the life of the pit unless the Division revokes them for cause.

Program Description:

All produced water pits shall be located on level ground in hydrologically stable areas away from any established drainage.

Pits shall have adequate storage capacity to contain all produced water and shall be constructed to prevent unauthorized surface or subsurface discharge of water, and shall be kept reasonably free from surface accumulation of liquid hydrocarbons.

Pits shall be fenced to prevent entry of livestock, wildlife and unauthorized people, and if required, equipped with flagging or netting to deter entry by birds (Ref. R615-9-4).

Division personnel shall be notified at least two working days prior to installing a pit liner so that an inspection of the leak detection system can be conducted. Whether the pit is to be lined or unlined, Division shall be afforded an opportunity to inspect the facility during the construction and operation of the pit (R615-9-6).

Operators shall notify the Division of the intention to do any maintenance and repair work on a produced water disposal pit.

The owner or operator shall submit a report to the Division on Form 9, at annual intervals, a general description of the working condition of the pit, the average monthly volume of produced water disposed of in the pit and a statement justifying continuation of the approval to utilize the pit for disposal purposes.

Inspection of the leak detection system shall be done and reported annually.

The occurrence of water in a leak detection system constitutes liner failure and requires immediate action. Further utilization of the pit will only be allowed after liner repairs and inspection by the Division.

All unauthorized discharges or spills from disposal facilities must be promptly reported to the Division.

Enforcement:

Failure to meet the requirements and standards for construction and operation of a pit shall be considered as noncompliance and will result in the imposition of corrective actions or a revocation of the permit.

UTAH

UNDERGROUND INJECTION CONTROL

Agency in Charge:

Utah Department of Natural Resources
Division of Oil, Gas and Mining
Suite 350, 3 Triad Center
355 West North Temple
Salt Lake City, Utah 84180-1203
801/538-5340

Key Laws or Regulations:

The Oil and Gas Conservation Act, Utah Code Ann. 40-6-1 Et Seq. (1953 as amended, revised February 1991).

Permits Required:

DOGM permit for Class II wells.

The application for an injection well shall include a properly completed DOGM Form 1 (Class II) and the following ---

1. A plat showing the location of the well and all other wells within 1/2 mile, surface owners and operators;
2. Copies of logs;
3. A complete description of the site;
4. Geological data;
5. Proof that a copy of the application was provided to all other operators, owners and surface owners within 1/2 mile from the proposed injection well;
6. Any other information that the board or division determines is needed (Ref. R615-5-2).

Applications are to be filed for each well within the project. The Executive Secretary may approve area permits as well (Ref. R448-7-6).

Notice of application shall be published in a daily newspaper in the city and county of Salt Lake and in a newspaper of general circulation in the county where the proposed well is located (R615-5-3). If no written objection is received by the Division within 30 days after publication (40 CFR 124.10) and a hearing is not otherwise required, the application may be considered and approved.

Permits are valid for the life of injection wells unless revoked by the Division for just cause notice and hearing.

Program Description:

Before operating a new injection well, the casing shall be pressure tested to not less than the maximum authorized pressure or 300 psi, whichever is greater.

Before operating an existing well newly converted to an injection well, the casing outside the tubing shall be pressure tested to not less than maximum authorized pressure, or to 1,000 psi, whichever is lesser, provided each well shall be tested to a minimum 300 psi.

Each injection well shall be pressure tested not less than once every five years thereafter.

The operator shall submit monthly reports within 30 days following the end of the month of operations for each EOR injection well:

1. Injection pressure, rate and volume on DOGM Form 2;
2. Daily injection pressure, rate and volume for each disposal and/or storage well on DOGM Form 3.

The operator shall also file a monthly report to account for the disposal of any water produced in conjunction with the production of oil and/or gas within 30 days following the end of the month of operations, using DOGM Form 6.

Annual fluid injection reports shall be filed within 60 days following the end of the year on DOGM Form 4.

The authority to transfer a permit from one operator to another requires approval from the Division. Requests for transfer of authority are made using DOGM Form 5.

An immediate verbal communication shall be submitted to the Division upon discovery of an undesirable event, or as soon as practical within a maximum of 24 hours (R615-3-32).

A complete written report of the incident shall be submitted to the Division within five days following the conclusion of the undesirable event. The operator may use Form 9 provided by the Division.

Enforcement:

The Division director or authorized agent, upon presentation of proper identification, shall have access to the property and operator's records during normal business hours. Any violations or deficiencies shall be reported and kept on file by the Division, a copy of which shall be provided to the operator.

The operator shall provide the Division with a written plan and expected date of completion to bring the facility into compliance.

The Division may conduct hearings to investigate violations of applicable statutes, rules and orders. Penalties include revocation of the permit and may be extended to civil or criminal court proceedings.

UTAH

HAZARDOUS WASTE

Agency in Charge:

Utah Department of Environmental Quality
Division of Water Quality
State of Utah
Salt Lake City, Utah 84114-4870
801/538-6146

Key Laws or Regulations: The Oil and Gas Conservation Act, Utah Code Ann. 40-6-1 Et Seq. (1953 as amended, revised February 1991); RCRA.

Permits Required: Area permit (Class I wells) or RCRA permit.

The following is applicable for Class I wells.

The area permit may authorize the permittee to construct and operate, convert or plug and abandon injection wells within the permit area (R448-7-6).

Application for permit shall be made by the operator on a form provided by the Executive Secretary (R448-7-8) and shall have several attachments, including but not limited to:

1) Topographic map extending one mile beyond the area boundary, depicting the facility, all other wells, springs and surface water bodies;
2) Tabulation of data on all wells within the area of review which penetrate into the injection zone;
3) Maps and cross-sections of all underground sources of drinking water;
4) Maps and cross-sections detailing the geology, lithology and hydrology of the area;
5) Proposed operating plans;
6) Testing and monitoring plans;
7) Contingency plans;

8) Construction procedures, including elements required to be in compliance with 40 CFR 146.65, 146.66, 146.71 and 146.72;
9) Such other information that may be required by the Executive Secretary.

Permits shall be effective for fixed terms not to exceed 10 years, subject to modification, re-issuance, revocation or termination by the Executive Secretary.

Program Description:

All hazardous waste wells shall be sited so that they inject into a formation that is beneath the lower most formation containing USDW within two miles of the wellbore (R448-7-10).

Testing, monitoring and reporting shall comply with 40 CFR 146.68 and 146.69.

Hazardous waste injection restrictions prohibit dilution as a substitute for treatment and provide case-by-case procedures (R448-7-11), as delineated in 40 CFR 148.

Enforcement:

Permits may be revoked because of: noncompliance; failure in the permitting process to disclose all the facts; misrepresentation of any relevant fact; the operation is endangering public health or the environment.

WYOMING

AIR POLLUTION

Agency in Charge:

Division of Air Quality
Department of Environmental Quality
122 West 25th Street
Cheyenne, Wyoming 82002
307/777-7391

Key Laws or Regulations:

Wyoming Environmental Quality Act, Article 2, Section 35-11-201, 35-11-202; Wyoming Air Quality Standards and Regulations.

Permits Required:

Construction and operation permits.

Approval to construct or modify fuel burning equipment shall not be required for those units which have a heat input not more than 25 million Btu per hour and burns only gaseous fuel containing not more than 20 grains total sulfur/100 $ft.^3$; or burns any other fuel having a heat input of not more than 10 million Btu per hour. However, even though an owner or operator plans to construct or build a facility using fuel burning equipment small enough not to require a construction permit, he would be well advised to notify the Administrator before proceeding with any construction plans.

The owner or operator of an EOR facility shall file an application on forms provided by the Division. The application shall be accompanied by site information, plans, descriptions, specifications, drawings, construction schedule and a statement detailing the nature and amount of emissions and the manner in which they will be controlled, plus any additional information required by the Administrator.

The applicant shall conduct continuous ambient air quality analyses as deemed necessary by the Administrator up to one year preceding the application date [Ref.: Section 21 (b)(i)].

The proposed facility will have provisions for measuring emissions, and the operator must assure the Division that the ambient air quality will be maintained, or that the facility will not cause significant deterioration of existing ambient air quality. The proposed installation will use BACT to reduce or eliminate emissions from the facility.

Each application is technically reviewed for completeness. This typically is done within 30 days after receipt. The Administrator will notify the applicant -- if the application is complete, he will recommend approval or denial. The Administrator will publish notice of the application and his proposed action within 60 days. Another 30 days are allowed for public comment and possibly a hearing. The final decision to grant or deny an application is made at the end of that period.

A construction permit is valid until the permit to operate the facility for which the application was filed is granted or denied, or the application is cancelled. Approval to construct shall become invalid if construction is not commenced within 24 months after receipt of the permit, or if construction is discontinued for 24 months or more.

Construction permits are granted for whole projects or phases of projects, but not for individual wells.

An operating permit is granted by the Administrator after the facility has been constructed or modified in accordance with the terms and conditions of the construction permit. The operating permit is valid for the life of the project unless it is revoked for cause, modified or terminated.

Program Description:

The owner or operator shall furnish written notice to the Administrator at least 30 days prior to initial start-up date and again within 15 days after the actual start-up of each source.

Within 30 days after achieving maximum design production rate, but within 90 days after initial start-up, the operator of emission sources shall conduct performance tests and will furnish the Administrator with a written report of the results of each performance test. The state may monitor such tests and may also conduct them.

Operators shall provide written notice to the Administrator 15 days prior to each performance test, which shall be done at least once a year after the initial test. If emissions are too heavy, the Administrator may require more frequent tests or continuous monitoring, or both.

State inspections are done annually or at another frequency, depending on the amount and type of emissions.

Particulate matter emissions shall not exceed $150\mu g/m^3$ in a 24 hour period.

Sulfur oxide emissions shall not exceed 0.1 ppm maximum in a 24 hour period more than once per year.

Emission episodes in excess of regulation limits shall be reported orally to the Division within 24 hours and a corrective program acceptable to the Division shall also be furnished.

Enforcement:

Violators of these regulations are usually given up to 10 days to come into compliance. However, if the operator or owner willfully and knowingly violated the regulations penalties up to $10,000 per day can be assessed for civil complaints. Criminal penalties can range up to $25,000 per day for each day the violation continues, or imprisonment for not more than one (1) year, or both.

WYOMING

WATER POLLUTION

Agency in Charge:	Wyoming Oil and Gas Conservation Commission P.O. Box 2640 777 West First Street Casper, Wyoming 82602 307/234-7147
Key Laws or Regulations:	Wyoming Environmental Quality Act, Article 3, Section 35-11-301 thru 35-11-307; Wyoming Oil and Gas Conservation Commission Rules and Regulations, Section III, Rules 326, 327.
Permits Required:	NPDES permit from the Department of Environmental Quality (DEQ). At no time will the fluid contents of any pit be discharged or allowed to escape on the surface without approval by the DEQ. A permit may be allowed by the DEQ for one time land application of drilling fluids. At no time will drilling fluids be discharged into live waters or into any surface drainages that lead into live waters of the state. EOR operators shall file "Application for Permit to Use Earthen Pit" Form 14A for retention of produced water, and shall submit it to the Supervisor, Oil and Gas Conservation Commission. A permit may not be necessary if any earthen pit is to receive water temporarily under emergency conditions. However, within 24 hours of the first business day after construction of the emergency pit, the owner shall verbally notify the Supervisor.

Produced water pits which receive less than five barrels of water per day may be exempt from the formal permit on application to the Supervisor, accompanied by a water analysis of the produced water and a statement by the owner that the volume of water produced will be monitored on a monthly basis.

The Commission may administratively approve field or area-wide applications covering earthen retaining pit construction and operation.

The application for a permit for an earthen pit shall:

a) Completely identify ownership and facility;
b) Provide analysis of water and quantities of oil and grease per liter;
c) Describe inflow rate, pit dimensions, capacity, disposal method(s), distance from nearest freshwater source, subsoil;
d) Type of sealing, specifications, method of application;
e) Contain any other information, maps, etc., required by the Commission (Ref.: Rule 326, Form 14A).

The underground disposal of fresh water or of any water unfit for livestock, irrigation or other domestic uses, is permitted only on order by the Commission, obtained by application. Permits authorizing disposal wells remain valid unless revoked by the Commission for just cause.

The application for an underground disposal permit shall include:

a) A plat showing location of the well and all other wells including dry holes, and the names of all lease operators and surface owners within 1/2 mile from the proposed site;
b) An affidavit showing that lease operator and surface owners within 1/2 mile have been provided with a copy of the application for underground disposal;
c) Description of the formation into which the water is to be injected;

d) Description of the casing in the disposal well, proposed method for testing the casing;
e) A statement specifying the source of the water, average, minimum and maximum amounts to be injected, and minimum and maximum disposal pressures;
f) Laboratory analyses of the water to be disposed of and the water in the formation into which disposal is taking place;
g) Provide depth and areal extent of all useable fresh and potable USDW underlying the area proposed for exemption;
h) Establish the mechanical integrity for completed disposal wells;
i) All other information and attachments required by the Commission or Supervisor.

The Commission will publish notice of the disposal application 15 days before approval in a local county newspaper of general circulation.

Disposal operations must commence within one year of the approval date or the permit will be null and void.

All of the information on disposal wells is contained in Rule 336, pp 36-39.

Program Description:

The Commission exercises regulatory authority over the construction, location, operation and reclamation of produced water pits located in producing fields and which are used for the storage, treatment and disposal of production and treater wastes.

Owners will ensure that the earthen retaining pit will be used only for the retention or disposal of fluids associated with the operation for which the pit was constructed and permit granted.

Any earthen retaining pit shall be kept reasonably free of surface accumulations of hydrocarbons, and shall be cleaned within 10 days after discovery. All earthen retaining pits shall be adequately fenced and provided with overhead

flagging or other material to keep out wildlife, domestic stock and humans.

Any application for approval of reserve pit fluid injection shall demonstrate that USDW will not be influenced by the disposal operation (Ref. Rule 326, pp. 32-33). This order is for a one-time disposal.

The owner shall take all reasonable precautions to prevent accidents and fires. He shall notify the Supervisor within 24 hours of accidents or fires of major consequences.

Enforcement:

Any person who violates any provision of these rules or who after being warned by the Commission violates the rules or order of the Commission shall forfeit $500 to the Wyoming oil and gas conservation fund. Any person who knowingly violates any rule, regulation or order of the Commission shall be subject to a civil penalty not exceeding $1,000 for each act of violation and for each day that such violation continues.

Any person who, for the purpose of evading this act or any rule, regulation or order of the Commission shall make or cause to be made any false entry in any record required by this act [Section 30-5-119(b)], or shall omit or cause to be omitted any required information from any record, shall be guilty of a misdemeanor. Upon conviction, that person shall be subject to a fine not exceeding $5,000 or imprisonment not exceeding six (6) months, or both.

WYOMING

UNDERGROUND INJECTION CONTROL

Agency in Charge: Wyoming Oil and Gas Conservation Commission
P.O. Box 2640
777 West First Street
Casper, Wyoming 82602
307/234-7147

Key Laws or Regulations: Wyoming Environmental Quality Act Article 3, Section 35-11-301 thru 35-11-307; Wyoming Oil and Gas Conservation Commission Rules and Regulations, Section IV, Rules 401-407.

Permits Required: UIC permit.

A UIC permit is issued by the Commission, but is reviewed by the Water Quality Division of the Wyoming Department of Environmental Safety first.

The applicant must demonstrate that the proposed injection well will not endanger fresh water sources. Injection wells shall be cased and the casing cemented in such a manner that damage will not be caused to oil, gas or fresh water sources.

An application for injection shall contain:

a) A plat showing the area involved, the location of the well which includes drilling wells, dry holes and abandoned wells, all properly designated;
b) A list of all lease operators or owners and surface owners within 1/2 mile of the proposed well or wells;
c) An affidavit showing that operators or owners and surface owners within 1/2 mile were provided with a copy of the application for injection;

d) A full description of the particular operation for which approval is requested;
e) The pools from which wells are producing or have produced, and the names, description and depth of the pool or pools affected;
f) The log of the injection well or wells;
g) A description of the casing of the injection well, or the proposed casing program, and the proposed method for testing the casing;
h) A statement concerning the type of fluid to be used for injection, its source, and the estimated amounts to be injected daily, plus the average and maximum injection pressures;
i) Evidence that the proposed injection well will not initiate fractures;
j) Standard laboratory analysis of the water to be injected and the water in the formation into which fluid is to be injected;
k) Names and addresses of the operator or operators of the project;
l) Mechanical conditions of all wells within 1/4 mile of the proposed injection well which have penetrated the injection zone surrounding the site;
m) A reference to the Commission order exempting the aquifer that is to receive the fluid, plus the depth and areal extent of all useable fresh and potable water (USDW) underlying the area proposed for exemption;
n) Any other information, maps, drawings, etc. required by the Commission or Supervisor.

The Commission will publish notice of the injection application fifteen (15) days before approval in a newspaper of general circulation in Natrona County and in a newspaper of general circulation in the county in which the injection well is located.

Injection operations must commence within one year of the approval date of the application or the approval is null and void. Otherwise a permit authorizing an injection well shall remain valid unless revoked by the Commission for just cause.

Program Description:

Mechanical integrity for newly completed or newly converted injection wells must be established. Before a new well drilled for injection or disposal is operated, it shall be pressure tested to maximum authorized injection pressure or 300 psi, whichever is greater. Before an existing well newly converted to injection or disposal is operated, it shall be tested to maximum authorized pressure or 1,000 psi, whichever is greater, provided no pressure testing pressure shall be less than 300 psi.

Mechanical integrity pressure testing shall be done not less than once every five years thereafter. Each time that a mechanical integrity pressure test is done, the Commission shall be advised prior to the test so that a representative can witness the test. If a representative is unable to be present, the operator is required to provide documentation of the test to the Commission.

The operator shall notify the Commission immediately upon commencement of operations. He shall notify the Supervisor of the date operations are started, the type and source of injected substances, volumes injected and injection pressures. Thereafter he shall report EOR operations data monthly on Form 2 (Class II wells) or 16 (disposal wells).

In the event of a serious accident, fire or leakage, the owner or operator shall notify the Supervisor within 24 hours, and shall file a written report within 15 days, explaining what happened, causes for the incident, its resolution and measures taken to prevent a reoccurrence, if applicable.

Enforcement:

Any person who violates any provision of these rules or who after being warned by the Commission violates the rules or order of the Commission shall forfeit $500 to the Wyoming oil and gas conservation fund. Any person who knowingly violates any rule, regulation or order of the Commission shall be subject to a civil penalty not exceeding $1,000 for each act of violation and for each day that such violation continues.

Any person who, for the purpose of evading this act or any rule, regulation or order of the Commission shall make or cause to be made any false entry in any record required by this act [Section 30-5-119(b)], or shall omit or cause to be omitted any required information from any record, shall be guilty of a misdemeanor. Upon conviction, that person shall be subject to a fine not exceeding $5,000 or imprisonment not exceeding six (6) months, or both.

WYOMING

HAZARDOUS WASTE

Agency in Charge:	Hazardous Waste Management Department of Environmental Quality 122 West 25th Street Cheyenne, Wyoming 82602 307/777-7752
Key Laws or Regulations:	Wyoming Environmental Quality Act, Article 5, Section 35-11-501 thru 35-11-513; Hazardous Waste Management Rules and Regulations, Chapters 1 and 2.
Permits Required:	For disposal sites only. Wyoming adopted CFR rules, but issues permits under the state's jurisdiction. Under 40 CFR 261.4; "Drilling fluids, produced waters, and other wastes associated with the exploration, development or production of crude oil, natural gas or geothermal energy," are materials which are not considered to be hazardous wastes. No hazardous waste permit is required for drilling muds and/or EOR wastewater discharge pits. However, many drilling mud chemicals are considered to be hazardous, and their storage and disposal come under the aegis of CFR regulations and RCRA.

An RCRA permit is required for the storage of hazardous wastes, and this is issued by the state's Hazardous Waste Management Division. It typically takes nine months from application date to permit approval date.

Any spills, overflows or accidental discharges are reported to the Water Quality Division.

APPENDIX

EPA DEFINITIONS

Ambient air:	That portion of the atmosphere, external to buildings, to which the general public has access.
AQCR:	Air quality control region.
AQMA:	Air quality maintenance area.
BACT:	Best available control technology.
BMP:	Best management practices.
Btu:	British thermal unit.
CAA:	Clean Air Act.
CEMS:	Continuous Emissions Monitoring System.
CERCLA:	Comprehensive Environmental Response, Compensation and Liability Act.
CFR:	Code of Federal Regulations.
Class I area:	All of the following areas which were in existence on August 7, 1977 and may not be redesignated: (i) International parks; (ii) National wilderness areas which exceed 5,000 acres in size; (iii) National memorial parks which exceed 5,000 acres in size; (iv) National parks which exceed 6,000 acres in size.
Class II area:	Any other area, unless otherwise specified in the legislation creating such an area, but may be redesignated.

Class III area:	Redesignation of Class I or Class II area for permitting when it could not be done within a Class I or Class II area under either of those designations. Examples: Indian Reservation, land bordering an Indian Reservation.
CWA:	Clean Water Act.
DMR:	Discharge Monitoring Report.
EIS:	Environmental Impact Statement.
EPA:	United States Environmental Protection Agency.
EPCRA:	Emergency Planning and Community Right-to-Know Act.
Fossil fuel:	Natural gas, petroleum, coal and any form of solid, liquid, or gaseous fuel derived from such materials for the purpose of creating useful heat.
Fugitive emission:	Any air pollutant emitted to the atmosphere from a stack.
HWM:	Hazardous Waste Management facility.
MIT:	Mechanical integrity test.
MOA:	Memorandum of Agreement.
MOU:	Memorandum of Understanding.
NAAQS:	National Ambient Air Quality Standards.
NESHAP:	National Emission Standard for Hazardous Air Pollutants.
NPDES:	National Pollutant Discharge Elimination System.

NSR:	New source requirements.
PM:	Particulate matter -- any airborne finely divided solid or liquid material with an aerodynamic diameter smaller than 100 micrometers.
POTW:	Publicly owned treatment works.
PSD:	Prevention of serious deterioration of air quality.
RCRA:	Resource Conservation and Recovery Act.
SARA:	Superfund Amendments and Re-authorization Act.
SDWA:	Safe Drinking Water Act.
SIC:	Standard Industrial Code.
SIP:	State Implementation Plan.
SPCC:	Spill Prevention Control and Countermeasure Plan.
TPY:	Tons per year.
TSD:	Technical Support Document.
UIC:	Underground Injection Control program.
USDW:	Underground source of drinking water.
UST:	Underground storage tank.
VOC:	Volatile organic compound.

TABLE A-1

AIR EMISSION SOURCE PERMIT REQUIREMENTS

Agency/ State	Pre-Construction Permits: Combustion Source Size	Pre-Construction Permits: Air Quality Monitoring Requirements	Operating Permits & Standards	Permit Processing Time	Comments
U.S. EPA (Regional Office)	Emissions greater than (>) 100 tons per year of any pollutant	One year of continuous monitoring	BACT, NSPS	≤ 18 mos	Complex rules and standards; vary according to regions and ambient air quality
Alabama	New sources ≥ 50 tons per year of all air pollutants	≥ 6 months of continuous monitoring	Air permit, two phases: Construction & Operating	≤ 12 mos	Allowable emissions vary between Class I and Class II counties
California	No statewide rule	One year of continuous monitoring	Construction & Operating permits	Varies with local district	Rules vary from district to district
Colorado	Emissions ≥ 100 tons tons per year of any pollutant. Stationary internal combustion engines with < 5 TPY or < 50 horsepower are exempt	One year of continuous monitoring	Emission permit	3-4 mos	
Illinois	New sources ≥ 50 tons per year of all air pollutants	One year of continuous monitoring	Construction & Operating permits	3 mos	

Agency/ State	Pre-Construction Permits: Combustion Source Size	Pre-Construction Permits: Air Quality Monitoring Requirements	Operating Permits & Standards	Permit Processing Time	Comments
Kansas	Emissions ≥ 100 tons per year of any pollutant	≥ 6 mos of continuous monitoring	Construction & Operating permits	≤6 mos	
Louisiana	Emissions ≥ 100 tons per year of any pollutant	≥ One year of continuous monitoring	Pre-construction (also used for Operating permit)	≤ 12 mos	Allowable emission increases vary among Class I, Class II and Class III areas
Michigan	Emissions > 100 tons per year of any pollutant	One year of continuous monitoring	Permit to Install & permit to Operate	2-4 mos	
Mississippi	Emissions ≥ 100 tons per year of any pollutant	One year of continuous monitoring	Permit to Construct & Permit to Operate	3-6 mos	
Montana	Emissions > 25 tons per year of any pollutant	≥ One year of continuous monitoring	Air Quality Permit (used for construction and operation)	≤ 6 mos	Allowable emissions vary between Class I and Class II areas
New Mexico	Emissions ≥ 25 tons per year of any pollutant	≥ One year of continuous monitoring	Construction & PSD permits	≤ 6 mos	
North Dakota	Emission ≥ 250 tons per year of any air contaminant	≥ 6 months of continuous monitoring	Permit to Construct & Permit to Operate	≤ 6 mos	Allowable emission increases vary between Class I & Class II areas

Agency/ State	Pre-Construction Permits: Combustion Source Size	Pre-Construction Permits: Air Quality Monitoring Requirements	Operating Permits & Standards	Permit Processing Time	Comments
Oklahoma	Emissions ≥ 100 tons per year of a given pollutant	≥ One year of continuous monitoring	Constriction & Operating permits	3-18 mos	
Texas	Emissions > 250 TPY of CO or NO_x or 25 TPY of any other contaminant except CO_2, H_2, H_2O, N_2, CH_4, CH_3, H2 and or O2	One year of continuous monitoring	Construction & Operating permits	≤ 6 mos	Allowable emissions vary among counties
Utah	Emissions ≥ 50 tons per year of all pollutants	≥ One year of continuous monitoring	Construction permit (also used for operations)	3 mos	Allowable emission increasee vary among Class I, Class II & Class III areas
Wyoming	Any new facility which may cause an increase of pollutants in the atmosphere	One year of continuous monitoring	Construction & Operating permits, BACT	4 mos	

TABLE A-2

WATER AND SOLID WASTE REQUIREMENTS

Agency/ State	Surface Water Discharge Permit	Underground Injection Class II & Water Injection Wells - UIC Permit	Hazardous Waste Management: Temporary Storage (<90 days)	Hazardous Waste Management: Long Term Storage On-Site	Hazardous Waste Management: Off-Site Disposal	Time to Process (All Permits)
U.S. EPA (Regional Office)	NPDES Permit (Only in states which do not have primacy)	UIC Permit (only in states which do not have primacy)	Temporary Permit	RCRA Permit	No Permit Sign manifest to transporters. Get transporters signature, retain copy.	6 months
Alabama	NPDES	UIC	No permit	NPDES	No Permit	6 mos
California	NPDS	Construction/UIC		Operating Permit	Delivery to licensed transporter	2-4 mos
Colorado	CDPS	UIC	No permit	RCRA rules		2-6 mos
Illinois	No discharge allowed	UIC	Construction permit	Construction permit		1-3 mos
Kansas	Surface Pond permit	UIC		RCRA rules		6 mos
Louisiana	LWDPS & NPDES	UIC		RCRA rules		1-3 mos
Michigan	NPDES	Construction & Operating permits		NPDES		3-12 mos

Agency/ State	Surface Water Discharge Permit	Underground Injection Class II & Water Injection Wells - UIC Permit	Hazardous Waste Management			Time to Process (All Permits)
			Temporary Storage (<90 days)	Long Term Storage On-Site	Off-Site Disposal	
Mississippi		UIC	Temporary Permit	RCRA Permit		2 mos
Montana	MPDES	MGWPCS		RCRA rules		6 mos
New Mexico	NPDES from EPA	UIC		NPDES, RCRA rules		2 mos
North Dakota	NDPDES	UIC	No permit	RCRA		1-6 mos
Oklahoma	NPDES from EPA	Construction & Operating permits		RCRA rules		2-4 mos
Texas	NPDES from EPA	UIC	No permit	No permit	No permit	2 mos
Utah	UPDES	UIC	Area permit	Area permit		1 mo
Wyoming	NPDES	UIC		RCRA		1-9 mos

TABLE A-3

STATE EOR ENVIRONMENTAL REGULATORY AGENCIES

State	Oil & Gas Board/ Commission/Division	Air Quality	Water Quality (NPDES & Class I Wells)	Underground Injection (Class II Wells)	Hazardous Waste
Alabama	State Oil & Gas Board 420 Hackberry Lane P.O. Drawer 0 Tuscaloosa, AL 35486 205/349-2852	Air Division Dept. of Envirn. Mgt 1751 Congressman WL Dickenson Dr. Montgomery, AL 36130 205/271-7700	Water Division Dept. of Environmental Mgt. 1751 Congressman WL Dickenson Dr. Montgomery, AL 36130 205/271-7700	State Oil & Gas Board 420 Hackberry Lane P.O. Drawer 0 Tuscaloosa, AL 35486 205/349-2852	Land Division Dept. of Envirn. Mgt. 1751 Congressman WL Dickenson Dr Montgomery AL 36130 205/271-7700
California	Division of Oil & Gas Dept. of Conservation 1416 Ninth St, Rm 1310 Sacramento, CA 95814 916/445-9686	Air Resources Board 1102 Q Street P.O. Box 2815 Sacramento, CA 95812 916/322-2990	Water Resources Control Board 901 P Street Sacramento, CA 95814 916/445-3993	Division of Oil & Gas Dept. of Conservation 1416 Ninth St, Rm 1310 Sacramento, CA 95814 916/445-9686	Toxic Substances Control Div. Dept. of Health Services 400 P Street Sacramento, CA 95814 916/324-7193
Colorado	Oil&Gas Conservation Div. Dept. of Natural Resources 1580 Logan St., Suite 380 Denver, CO 80203 303/894-2100	Air Pollution Control Div. Colorado Dept. of Health 4210 E. 11th Ave. Denver, CO 80220 303/331-8500	Water Quality Control Div. Colorado Dept. of Health 4210 East 11th Avenue Denver, CO 80220 303/331-4530	Oil & Gas Conservation Division Dept. of Natural Resources 1580 Logan St., Suite 380 Denver, CO 80203 303/894-2100	Waste Management Division Colorado Dept of Health 4210 E. 11th Ave. Denver, CO 80203 303/331-4830

State	Oil & Gas Board/ Commission/Division	Air Quality	Water Quality (NPDES & Class I Wells)	Underground Injection (Class II Wells)	Hazardous Waste
Illinois	Oil & Gas Division Dept. of Mines & Minerals 300 W. Jefferson, #300 Springfield, IL 62706 217/782-7756	Div. of Air Pollution Control 2200 Churchill Rd Springfield IL 62706 217-782-7326	Water Pollution Control Board 2200 Churchill Road Springfield, IL 62706 217/782-1696	Oil & Gas Division Dept. of Mines & Minerals 300 W Jefferson, #300 Springfield, IL 62706 217/782-7756	Oil & Gas Division Dept. of Mines & Minerals 300 W Jefferson, #300 Springfield, IL 62706 217/782-7756
Kansas	Conservation Division Kansas Corp. Commission 200 Colorado Bldg 202 W. 1st St. Wichita KS 67202-1286 316/263-3238	Bureau of Air & Waste Management Dept of Health & Environment Forbes Field, Bg 740 Topeka, KS 66620-0002 913/296-1570	Conservation Division Kansas Corp. Commission 200 Colorado Bldg. 202 W. 1st St. Wichita, KS 67202-1286 316/263-3238	Conservation Division Kansas Corp. Comm. 200 Colorado Bldg. 202 W. 1st St. Wichita, KS 67202-1286 316/263-3238	Bureau of Air & Waste Management Dept. of Health & Environment Forbes Field, Bg. 740 Topeka, KS 66620-7202 913/296-1600
Louisiana	Office of Conservation Dept. of Natural Resources P.O. Box 94275 Baton Rouge LA 70804-9725 504/342-5515	Air Quality Div. Dept. of Environ. Quality P.O. Box 82135 Bluebonnet Blvd. Baton Rouge LA 70884-2135 504/765-0219	Office of Water Resources Dept. of Environ. Quality P.O. Box 82215 Bluebonnet Blvd. Baton Rouge, LA 70884-2215 504/765-0634	Office of Conservation Dept. of Natural Resources P.O. Box 94275 Baton Rouge LA 70804-9725 504/342-5515	Hazardous Waste Div. Dept. of Environ. Qual. P.O. Box 82178 Bluebonnet Blvd. Baton Rouge, LA 70884-2178 504/765-0634

State	Oil & Gas Board/ Commission/Division	Air Quality	Water Quality (NPDES & Class I Wells)	Underground Injection (Class II Wells)	Hazardous Waste
Michigan	Geological Survey Div. Dept. of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/334-6974	Permit Section Air Quality Div. Dept. of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/373-7023	Surface Water Quality Div. Dept. of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/373-8088	Geological Survey Div. Dept. of Natural Resources P.O. Box 30028 Lansing, MI 48909 517/334-6974	Waste Mgmt. Div. Dept. of Natural Resources P.O. Box 30241 Lansing, MI 48909 517/373-2730
Mississippi	State Oil & Gas Board 500 Greymont Ave, Su. E P.O. Box 1332 Jackson, MS 39201 601/354-7142	Bureau of Pollution Control Dept. of Environ. Quality P.O. Box 10385 Jackson, MS 39289-0385 601/961-5171	Office of Pollution Control Dept. of Environ. Quality P.O. Box 10385 Jackson, MS 39289-0385 601/961-5171	State Oil & Gas Board 500 Greymont Ave, Su. E P.O. Box 1332 Jackson, MS 39201 601/354-7142	State Oil & Gas Board 500 Greymont Ave, Su. E P.O. Box 1332 Jackson, MS 39201 601/354-7142
Montana	Oil & Gas Conservation Div Natural Resources & Conservation Dept. 2535 St. Johns Ave. Billings, MT 59102 406/656-0040	Air Quality Bureau Dept. of Health & Environ. Services Cogswell Bldg. 1400 Broadway Helena, MT 59620 406/444-3454	Water Quality Bureau Dept. of Health & Envirn. Services Cogswell Bldg. 1400 Broadway Helena, MT 59620 406/444-2406	Water Quality Bureau Dept. of Health & Environ. Services Cogswell Bldg. 1400 Broadway Helena, MT 59620 406/444-2406	Hazardous Waste Bur. Dept. of Health & Environmental Serv. Cogswell Bldg. 1400 Broadway Helena, MT 59620 406/444-2821

State	Oil & Gas Board/ Commission/Division	Air Quality	Water Quality (NPDES & Class I Wells)	Underground Injection (Class II Wells)	Hazardous Waste
New Mexico	Oil Conservation Div. N.M. Water Quality Control Commission 310 Old Santa Fe Trail P.O. Box 2088 Santa Fe NM 87504-2088 505/827-5000	Environ. Dept. 1190 St. Francis Dr P.O. Box 26110 Santa Fe NM 87502 505/827-2850	Oil Conservation Div. N.M. Water Quality Control Commission 310 Old Santa Fe Trail P.O. Box 2088 Santa Fe NM 87504-2088 505/827-5000	Oil Conservation Div. N.M. Water Quality Control Commission 310 Old Santa Fe Trail P.O. Box 2088 Santa Fe NM 87504-2088 505/827-5000	Environ. Dept. 1190 St Francis Dr P.O. Box 26110 Santa Fe NM 87502 505/827-2929
North Dakota	Oil & Gas Division N.D. Industrial Comm. 600 East Blvd. Bismark, ND 58505 701/224-2969	Environ. Eng. Div. ND Dept. of Health 1200 Missouri Ave. P.O. Box 5520 Bismark, ND 58502-5520 701/221-5188	Div. of Water Quality N.D. Dept. of Health 1200 Missouri Ave. P.O. Box 5520 Bismark, ND 58502-5520 701/221-5210	Oil & Gas Division N.D. Industrial Comm. 600 East Blvd. Bismark, ND 58505 701/224-2969	Environ. Eng. Div. N.D. Dept. of Health 1200 Missouri Ave. P.O. Box 5520 Bismark, ND 58502-5520 701/221-5188
Oklahoma	Oklahoma Corp. Comm. Jim Thorpe Bldg. 2101 N. Lincoln Blvd. Oklahoma City, OK 73105 405/521-2302	Air Quality Svce. Oklahoma Dept of Health 1000 NE 10th St Box 53551 Oklahoma City OK 73152 405/271-5220	Water Quality Division Oklahoma Water Res. Board 600 N. Harvey P. O. Box 150 Oklahoma City, OK 73101 405/231-2541	Underground Inj. Dept. Oklahoma Corp. Comm. Jim Thorpe Bldg. 2101 N. Lincoln Blvd. Oklahoma City OK 73105 405/521-2500	Haz. Waste Mgt. Svce. Oklahoma State Dept of Health 1000 NE 10th St Box 53551 Oklahoma City OK 73152 405/271-7047

State	Oil & Gas Board/ Commission/Division	Air Quality	Water Quality (NPDES & Class I Wells)	Underground Injection (Class II Wells)	Hazardous Waste
Texas	Oil & Gas Division Railroad Comm. of Texas P.O. Drawer 12967 Capitol Station Austin, TX 78711-2967 512/463-6790	Texas Air Control Board 6330 Hwy 290 East Austin, TX 78723 512/451-5711	Oil & Gas Division Railroad Comm. of Texas P.O. Drawer 12967 Capitol Station Austin, TX 78711-2967 512/463-6893	Oil & Gas Division Railroad Comm. of TX P.O. Drawer 12967 Capitol Station Austin, TX 78711-2967 512/463-6790	Oil & Gas Division Railroad Comm. of TX P.O. Drawer 12967 Capitol Station Austin, TX 78711-2967 512/463-6790
Utah	Div. of Oil, Gas & Mining Utah Dept. of Natural Resources Su. 350, 3 Triad Center 355 W. North Temple Salt Lake City, UT 84180-1203 801/538-5626	Utah Bureau of Air Quality Control UT Dept. of Health 1950 W No. Temple P.O. Box 1660 Salt Lake City, UT 84116-0690 801/538-6108	Environmental Health Div. Utah Dept. of Health 1950 W. North Temple P.O. Box 16690 Salt Lake City, UT 84116-0690 801/538-6146	Div. of Oil, Gas & Mining Utah Dept. of Natural Resources Su. 350, 3 Triad Center 355 W. North Temple Salt Lake City, UT 84180-1203 801/538-5340	Div. of Oil, Gas, & Mining Utah Dept. of Natural Resources Su 350, 3 Triad Center 355 W. North Temple Salt Lake City, UT 84180-1203 801/538-5340
Wyoming	Oil & Gas Conser.Comm. P.O. Box 2640 777 W. 1st St. Casper, WY 82602 307/234-7147	Div. of Air Quality Dept. of Environ. Quality 122 W. 25th St. Cheyenne WY 82002 307/777-7391	Oil & Gas Conser. Comm. P.O. Box 2640 777 W. 1st St. Casper, WY 82602 307/234-7147	Oil & Gas Conser. Comm. P.O. Box 2640 777 W. 1st St. Casper, WY 82602 307/234-7147	Hazardous Waste Mgt. Dept. of Environmental Quality 122 W. 25th St. Cheyenne, WY 82002 307/777-7752

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