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**ENVIRONMENTAL REGULATIONS HANDBOOK
FOR ENHANCED OIL RECOVERY**

Work Performed for the U.S. Department of Energy
Under Contract No. DE-AC19-BC00050

Date Published—August 1980

Spears and Associates, Inc.
Tulsa, Oklahoma

U. S. DEPARTMENT OF ENERGY

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FOR ENHANCED OIL RECOVERY**

FINAL REPORT

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PREFACE

This handbook was prepared as a part of U.S. Department of Energy contract No. DE-AC-19-78BC00050. The contents of this handbook were edited by Spears and Associates with legal counsel and interpretation provided by Mr. Richard T. Sonberg (legal counsel to Spears and Associates, Inc.) and Mr. Sandford E. Gaines, an environmental law specialist.

The project manager and assistant project manager, as principal editors of the finished handbook, retain responsibility for any errors in judgement or fact.

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INTRODUCTION

Purpose and Scope

This handbook is intended to serve owners and operators of enhanced oil recovery operations as a guidebook to the environmental laws and regulations which have special significance for enhanced oil recovery (EOR).

EOR, as used in this handbook, refers to what is also called tertiary recovery. The term "tertiary recovery" can be applied to any method used to recover more oil from a petroleum reservoir than would be obtained by primary or secondary recovery. 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 the oil. Conventional, secondary recovery methods, such as waterfloods, (in which water is injected to supplement original reservoir forces and drive more oil to producing wells) are not considered to be enhanced recovery methods under this definition.

There are three major categories of EOR processes, thermal (including both steam injection and in-situ combustion), miscible gas, and chemical. These processes are used only after a well or reservoir has ceased to produce oil economically through primary or secondary methods. Because EOR will only be used in existing or abandoned wells and fields, this handbook does not belabor the details of environmental laws and rules regulating conventional oil and gas exploration, drilling, and production. There are other publications available that cover such operations. The focus of this handbook is on those laws and regulations

that specifically apply to the unique features of EOR, such as emissions from steam generators or underground injection of chemical fluids.

The primary emphasis in the handbook is on laws and regulations for the control or prevention of pollution. These may be outlined as follows:

- o Air Pollution Control: The Clean Air Act (as amended in 1977) and corresponding state laws, and federal and state regulations.
- o Water Pollution Control: The Clean Water Act (as amended in 1977 and 1978) and corresponding state laws, and federal and state regulations. This includes oil and hazardous substance spill notification and clean-up requirements.
- o Protection of Underground Water: The Safe Drinking Water Act (and related regulations) for underground injection control. States may regulate this through water pollution control programs or drinking water programs.
- o Solid Waste Management: The Resource Conservation and Recovery Act and federal regulations. State regulation varies dramatically from state to state.

EOR operators should also be aware of a variety of possible environmental restrictions on facility location or mode of operation. For example, special rules or prohibitions may apply in coastal areas, in wetlands, in or near the habitat of endangered species, or on federal or Indian lands. The final chapter of the handbook briefly outlines the major

federal laws that establish such requirements. An important point to keep in mind, however, is that operations on lands administered by a federal agency (such as the U.S. Geological Survey or the Bureau of Indian Affairs) could result in the necessity of preparing an environmental impact statement (as required by the National Environmental Policy Act).

This handbook has been designed as a planning tool and a convenient reference source. Every effort has been made to make it as complete as possible. However, environmental laws and regulations change frequently. Some programs described here are, in fact, not yet implemented, e.g., the Underground Injection Control (UIC) and Resource Conservation and Recovery Act (RCRA). Therefore, the users of the handbook should always contact the appropriate state and federal agencies to verify the latest requirements and procedures and to obtain permit forms at least six months in advance of intended commencement of operations. Large thermal projects will need even longer lead times to conduct air quality monitoring and obtain construction permits for their steam generators.

The 16 states included in the handbook (see Table of Contents) comprise the major oil-producing states in various regions of the country. Other significant producing states will be added later, as needed. However, this handbook can be informative for users in any state because it describes the typical scheme of environmental requirements. In addition, Table I-1 on Page vii indicates the environmental concerns presented by each EOR process.

The major topics covered in this handbook are as follows:

Chapter 1: General Guidelines for Complying with
Environmental Laws and Regulations

Since 1970, Congress has enacted a series of pollution control laws that set ambitious goals and strict nationwide standards. These laws follow similar administrative formats, so general principles and guidelines for planning, obtaining permits, and operating in compliance with the environmental laws have been included.

Although the federal laws dominate the field of environmental regulation, Congress has favored state administration of the programs. Many states have assumed the responsibility for one or more of the federal programs and have changed their state laws and regulations to conform with the federal requirements. In other states, however, the U.S. Environmental Protection Agency administers certain programs, and the state may operate a different program under state law. A discussion of these complex federal-state relationships begins on Page 1-12.

Chapter 2: Air Pollution Control

This chapter describes the elaborate regulatory scheme of the Clean Air Act and summarizes the key elements of the process for obtaining permits to construct "major" air pollution sources (such as steam generating units). The sections on state laws and regulations provide some of the particular emission limits that apply to various sources and pollutants and point out which minor sources (e.g., internal combustion engines) are exempt from permit requirements.

Chapter 3: Water Pollution Control

Chapter 3 covers surface water discharges, including accidental spills of oil or hazardous substances. There is a high degree of uniformity in the administration of the permit program for water pollution control, so many of the sections on state regulation refer back to the discussion of the federal permitting scheme.

Chapter 4: Protecting Drinking Water: Underground Injection Control

Underground injection of waste water is regulated separately from surface discharges under both federal and state laws. This chapter provides a detailed description of the proposed set of federal regulations; the state sections describe the existing requirements under state pollution control or oil and gas law.

Chapter 5: Hazardous Waste Management

The regulation of the disposal of hazardous waste is just emerging as a major component of the national environmental protection program. Because the federal regulations are still indefinite and many states do not specifically regulate hazardous waste disposal, this chapter is relatively short. Chemical EOR operators and others with hazardous waste problems will want to stay abreast of developments in this area over the next few years.

Chapter 6: Federal Laws Affecting Siting or Operation of EOR Facilities

This chapter provides brief summaries of some of the federal land use control laws and laws protecting specific resources (such as wildlife). The significance of these laws for a particular EOR operation will depend on its location. A project near a national wildlife refuge on the Gulf coast will be constrained by several of these laws, while a project on private land in an upland area of Kansas may not be affected at all.

Appendices:

At the end of this handbook are several appendices for reference purposes. Appendix 1 contains tables that will help users identify the topics of interest to them (depending on the type of process they propose to employ and the state in which the facility will operate). Appendix 2 provides full legal citations to the federal statutes described in the text. Appendix 3 gives the addresses of EPA regional offices and the offices of state agencies that administer the various environmental programs. Appendix 4 is a glossary of environmental and legal terms used in the handbook.

Table I-1

PRIMARY ENVIRONMENTAL CONCERNS (BY PROCESS) *

	STEAM INJECTION	IN SITU COMBUSTION	MICELLAR-POLYMER	CO ₂ INJECTION
AIR	<ul style="list-style-type: none"> • SO₂, NO_x, AND TSP EMISSIONS FROM STEAM GENERATORS • Wellhead emissions of H₂C 	<ul style="list-style-type: none"> • H₂C and CO emissions from wells • SO₂, NO_x, TSP emissions from air compressors 	<ul style="list-style-type: none"> • Fugitive emissions from on-site manufacture of chemicals 	<ul style="list-style-type: none"> • Leaks of CO₂ in process use or transport • H₂S emissions from wells
WATER USE	<ul style="list-style-type: none"> • SIGNIFICANT WATER DEMAND 	<ul style="list-style-type: none"> • Moderate water demand in wet combustion process 	<ul style="list-style-type: none"> • SIGNIFICANT WATER DEMAND 	<ul style="list-style-type: none"> • SIGNIFICANT WATER DEMAND
WATER EFFLUENTS	<ul style="list-style-type: none"> • DISPOSAL OF PRODUCED WATER 	<ul style="list-style-type: none"> • DISPOSAL OF PRODUCED WATER • Aquifer contamination from low pH water with trace metals resulting from corrosion of well casings 	<ul style="list-style-type: none"> • AQUIFER CONTAMINATION FROM INJECTED CHEMICALS • DISPOSAL OF PRODUCED WATER • Spills/leaks of chemicals to surface waters 	<ul style="list-style-type: none"> • DISPOSAL OF PRODUCED WATER • Aquifer contamination from low pH water and corrosion of well casings
SOLID WASTE	<ul style="list-style-type: none"> • Disposal of scrubber sludges • Disposal of water treatment wastes 	<ul style="list-style-type: none"> • Disposal of wastes from wellhead gas cleaning • Disposal of water treatment wastes 	<ul style="list-style-type: none"> • Disposal of wastes from on-site chemical manufacture • Disposal of water treatment wastes 	<ul style="list-style-type: none"> • Disposal of water treatment wastes

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

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 production 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 will not actually occur in sequence. Rather, they are three 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 these

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), waste water 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. As explained in the note at the end of this chapter, an operator may even need permits from both the federal and the 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:

- You can quickly learn the latest requirements and any pending changes.
- You can clear up confusing requirements or verify directly whether or not your facility needs a certain permit.

- You can obtain permit application forms and discuss with agency staff exactly what types of information you need to provide in the application.
- You establish your "good faith" interest in complying with their rules.
- You may be able to develop a personal contact who can help you smooth out any administrative problems.
- You can avoid being surprised by requirements that do not appear clearly in the law.
- You have an opportunity to describe your facility in favorable terms, before any person who may oppose your plans goes to the agency.
- 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 suffer 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 study 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 preconstruction 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, 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.¹

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 against 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 and will 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.² 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 299 listed substances) that reaches or may reach surface water must be reported immediately after it is discovered to EPA or the Coast Guard (call the Coast Guard at (800) 424-8802, 24-hours a day). The source of the spill will be liable for a moderate penalty (\$500 - \$5000) in addition to all costs of clean-up or containment. A legal battle, yet to be resolved, is being waged over the requirement to report oneself to the government for an action for which you will later be penalized.³ At the moment, both the reporting requirement and the penalty provision are still valid law.

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 ruled that OSHA inspections cannot be conducted against the owner's will without a warrant,⁴ 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.⁵

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 about \$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 source, its efforts to correct the violation, and its 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.

Indeed, 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 also usually has the choice of going directly to the court without notifying you in advance.⁶

1.3 A Note on Federal-State Relations

1.3.1 General Discussion

The American political system relies on the states to attend to most of the domestic affairs of government. The Constitution limits the authority of the national government to specified 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 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 1960's, 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 one 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 administration 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). 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 the 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 air or 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: An Example

EPA's recently proposed consolidated permit regulations (44 Fed. Reg. 34244, June 14, 1979) illustrate how this federal-state system operates in practice.. The consolidated permit regulations, when they become final, will govern permit issuing procedures and standards for four major programs: the National Pollutant Discharge Elimination System (NPDES - surface water pollution), the Underground Injection Control Program (UIC - protection of drinking water), the hazardous waste management program under the Resource Conservation and Recovery Act (RCRA), and the Prevention of Significant Deterioration (PSD) program under the Clean Air Act.

The consolidated permit regulations contain three parts. (See Table 1-1.) The first part gives the definitions and the basic program requirements for all four programs. These include regulations about who must apply for a permit and what terms and conditions the permit must contain. The second part specifies the requirements that a state permit program must meet in order to be approved by EPA. The third part establishes detailed permit issuing procedures that EPA will follow when the state has no approved program and EPA is responsible for issuing permits. Some of these requirements, however, apply to the states as well.

The definitions and basic program requirements derive from the federal laws, which establish standards that apply

TABLE 1-1

OUTLINE OF U.S. EPA's PROPOSED CONSOLIDATED PERMIT REGULATIONS
(44 Federal Register 34244, June 14, 1979)

Part 122 - Program Descriptions

- Subpart A - General Program Requirements
 - Definitions
 - Application Forms
 - Duration and Effect of Permits
 - General Conditions
 - Records and Reports
- Subpart B - Additional Requirements for Hazardous Waste Programs
- Subpart C - Additional Requirements for UIC Programs
- Subpart D - Additional Requirements for NPDES Programs

Part 123 - State Program Requirements

- Subpart A - General Program Requirements
 - Contents of State Program Submission
 - Memorandum of Agreement Between EPA and State
 - Compliance Evaluation Programs
 - Enforcement Authority
 - Procedures for Revising State Programs
 - Criteria and Procedures for EPA Withdrawal of State Program
- Subpart B - Additional Requirements for State Hazardous Waste Programs
- Subpart C - Additional Requirements for State UIC Programs
- Subpart D - Additional Requirements for State NPDES Programs
- Subpart E - Additional Requirements for State 404 (Dredge & Fill) Programs

Part 124 - Procedures for Decision Making
(applies to EPA; some parts apply to states)

- Subpart A - General Program Requirements
 - Draft Permits
 - Public Notices
 - Public Hearings
 - Cross Examination
- Subpart B - Specific Procedures for RCRA
- Subpart C - Specific Procedures for PSD Permits
- Subpart D - Specific Procedures for NPDES Permits
- Subpart E - Evidentiary Hearing (NPDES)
- Subpart F - Non-Adversary Procedures (NPDES)

nationwide. For example, the regulations define such terms as pollutant, underground drinking water source, and injection well based either on definitions in the laws or on EPA's interpretation of the laws. Similarly, the basic program elements specify requirements that are common to all the federal environmental laws, such as the right of federal or state inspectors to enter the facility, or the permit holder's obligation to perform and truthfully report all monitoring. In addition to requirements common to all programs, the regulations describe the special requirements under each law. For instance, the requirements for the UIC program include definitions of underground drinking water sources, classification of injection wells, and the minimum contents of an application for a UIC permit; the NPDES program has special procedural rules; and so forth.

The part of the regulations describing state program requirements focuses on the elements that the state administrative program must have and the procedures the state must follow to gain EPA approval. For any individual program, the state must describe the program, the administrative organization, the qualifications of the staff, the costs and sources of funding, and so forth. It must also certify through the attorney general its legal authority to carry out and enforce all parts of the program. Many of the basic program requirements in the first part of the regulations and many of the procedural requirements in the third part of the regulations are also imposed on the states. On the other hand, the states are specifically granted certain rights or choices that EPA itself does not have or has chosen not to employ.

The third part of the regulations, establishing permit procedures for EPA itself, has two aspects. First, some of these requirements are also imposed, by cross-reference, on the states. Second, in those states where the state has not

developed an approved program, EPA will be the permit authority for all sources covered by the program. In that case, the regulations in the third part will apply exactly as written. For the NPDES program in particular, EPA has developed some novel procedures for hearings and appeals; EOR operators requiring NPDES permits from EPA should be aware of these.

1.3.3 Conclusion

In the chapters that follow, both EPA programs and individual state programs will be described. At the time this handbook was prepared, the sharing of responsibilities between EPA and the states was as shown in Table 1-2. Many of the states administer the NPDES program, but when the consolidated permit regulations become final, they will have to make minor adjustments. The federal PSD program is still administered by EPA in every state except Wyoming, but many other states' programs will be approved by the end of 1979. The eventual form of the hazardous waste management program and the UIC program has been outlined in proposed regulations, but neither program is legally established at the federal level, so only existing state regulations apply.

Table 1-2 -- 1980 STATUS OF DELEGATION TO STATES OF FEDERAL PERMIT PROGRAMS

Existing Programs:

STATE	Clean Air Act PSD Permits			Clean Water Act NPDES Permits		
	APPROVED ¹	PENDING ²	NO PROGRAM ³	APPROVED ¹	PENDING ²	NO PROGRAM ³
Alabama		X		X		
California		X		X		
Colorado		X		X		
Illinois		X		X		
Kansas			X	X		
Kentucky		X				X
Louisiana		X				X
Mississippi		X		X		
Montana		X		X		
New Mexico		X				X
Ohio		X		X		
Oklahoma		X				X
Pennsylvania		X		X		
Texas		X				X
West Virginia			X			X
Wyoming	X			X		

1. Approved: EPA has approved the state program and has delegated to the state the authority to issue permits under federal law.

2. Pending: State has submitted a program to EPA for approval, but no final decision has been made by EPA.

3. No Program: State has not developed a program for issuing federal permits.

EPA Regional office issues federal permits for all sources in the state.

Planned Programs: Delegation of permitting authority to states will also be encouraged under the following laws, but program criteria and approval procedures have not yet been established. CLEAN WATER ACT: 404 (dredge and fill) permit program for inland waters. RESOURCE CONSERVATION AND RECOVERY ACT: Hazardous Waste Management Facility Permitting. SAFE DRINKING WATER ACT: Underground Injection Control (UIC) permit program.

Footnotes

Chapter 1

1. For example, in the case of *City of Murray v. Kentucky*, 13 ERC 1558 (Ky. Ct. App. 1979), the City was ordered to pay the state for environmental damage caused by excessive discharges from its sewage treatment plant, even though the City showed that the discharges were not the result of its negligence. In another case related to oil production, *U.S. v. Marathon Pipe Line Co.*, 12 ERC 1588 (7th Cir. 1978), the federal government assessed a penalty against the owner of a pipeline in Illinois for an oil spill that was caused by vandalism.
2. A good example that also shows how the liability extends to supervisors and managers is a pair of cases arising out of falsified water effluent monitoring at the Little Rock, Arkansas, sewage treatment plant. The federal government brought criminal prosecution against the individual employee who falsified the reports and also against the municipal sewer commission that is responsible for the plant. Both the employee and the commission were convicted. *U.S. v. Ouelette*, 11 ERC 1350 (E.D. Ark. 1977), and *U.S. v. Little Rock Sewer Commission*, 11 ERC 1377 (E.D. Ark. 1978).
3. Most federal appeals courts have followed the early case of *U.S. v. LeBoeuf Bros. Towing Co.*, 9 ERC 1118 (5th Cir. 1976), in which the court ruled that it was proper for the government to penalize a spiller on the basis of his self-reporting of the spill because 1) the penalty was a civil penalty, not a criminal one, and 2) the constitutional protection against self-incrimination extends only to individuals, not to corporations. A recent case in the Rocky Mountain area came out differently. In this case, the spiller was an individual, and the court decided that the penalty was more a punishment than a civil penalty. The court therefore ruled that the government could not use the self-report of the spill as evidence in the penalty case. *Ward v. Coleman*, 13 ERC 1213 (10th Cir. 1979).
4. *Marshall v. Barlow's, Inc.* 436 U.S. 307 (1978).
5. For example, EPA inspectors in Pennsylvania recently obtained a search warrant to investigate the source of a discharge of some hazardous wastes into a river. When the owner of the property refused to allow the inspectors on his land in spite of the warrant, the U.S. marshal arrested him, and he was convicted in court for interfering with the execution of a federal court warrant. *U.S. v. Peifer*, 13 ERC 1618 (E.D. Pa. 1979).

6. In one recent case, the U.S. EPA sued a city for discharge of pollutants in violation of the city's NPDES permit under the Clean Water Act. The city protested that the EPA had not notified it about the violation and had not allowed the city a chance to correct the problem. The court ruled that the EPA is not required to notify a discharger of a violation before bringing suit in court. U.S. v. City of Colorado Springs, 12 ERC 1329 (D. Colo. 1978).

2. AIR POLLUTION CONTROL

2.1 Introduction

EOR operations can generate air pollution in two ways. One is by direct emissions from surface facilities. Thermal processes in particular cause air pollution by the combustion of fuel to generate steam or to heat injected gases. Miscible and chemical processes have lesser emissions, coming primarily from internal combustion compressors and heat treaters which are also commonly used in conventional production. The second source of air pollution from EOR processes is the venting of hydrocarbons, hydrogen sulfide, or other gases during the recovery of the oil. Such emissions are highly variable and may be difficult to control.

The federal Clean Air Act sets the pattern for the state air laws and regulations, but its direct coverage is limited to sources producing more emissions than the typical EOR operation. An exception is steam generators in a steam drive EOR operation, which will come directly under Clean Air Act provisions. Another possible exception is unitized crude oil storage facilities in a major field, which may emit substantial amounts of hydrocarbon vapors.

More pertinent to EOR operations are the state laws and regulations. Typically, state air laws apply to all sources of air pollution, large and small, and most require both registration of existing sources and pre-construction permitting of new sources or relocated sources.

2.2 The Clean Air Act

2.2.1 State Implementation Plans

The keystone of the Clean Air Act¹ is the National Ambient Air Quality Standards (NAAQS),² which define the maximum acceptable levels of air pollution for a number of common pollutants. (See Table 2-1.) The primary standards are designed to protect the public health. The secondary standards are set to protect non-health values, such as vegetation or materials. (EPA has embarked on a several-year program to re-evaluate and revise the NAAQS.) The Act then requires the states to develop State Implementation Plans (SIPs) to achieve and maintain acceptable air quality.³ If the SIP meets certain standards specified in the Act, EPA approves it, and both the state agency and EPA can enforce its terms.

A SIP has three essential elements:

1. Emission limits for all types of air pollution sources.
2. Permit programs to manage new sources of air pollution.
3. Administrative authorities and resources to monitor air quality, inspect and test sources for compliance, issue permits, and plan for future air pollution management.

The emission limits are the basic mechanism by which the state seeks to reduce and control air pollution. Typically, they apply to broad industrial categories (e.g. incinerators; boilers) statewide. A common approach to sulfur oxide pollution is to limit the sulfur content of fuels that may be burned. States with local or regional air quality problems may set special limits on emissions or fuel for a region, or even for named sources within a region. California represents an extreme example of the regional approach, with semi-autonomous air pollution control districts directly responsible for most of the program.

<u>Pollutant</u>	<u>Primary</u> (to be attained by 1982)	<u>Secondary</u> (to be attained in reasonable time)
Sulfur oxides (measured as SO ₂)	80 µg/m ³ annual (0.03ppm) 365 µg/m ³ 24-hour (0.14ppm)	1300 µg/m ³ 3-hour (0.5ppm)
Particulate Matter	75 µg/m ³ annual 260 µg/m ³ 24-hour	60 µg/m ³ annual (guide) 150 µg/m ³ 24-hour
Carbon Monoxide	10 µg/m ³ (8-hour (9ppm) 40 µg/m ³ 1-hour (35ppm)	Same as primary
Ozone	235 µg/m ³ 1-hour (0.12ppm)	Same as primary
Hydrocarbons (as guide to ozone standard)	160 µg/m ³ 3-hour	Same as primary
Nitrogen Dioxide	100 µg/m ³ annual	Same as primary
Lead	1.5 µg/m ³ quarterly	Same as primary

The requirements for permit programs are now spelled out in the Clean Air Act in considerable detail. They will be discussed below. The administrative aspects are important to EPA as assurance that the SIP will be put into effect, but individual sources will not be directly affected by them.

Two types of federal standards supplement the SIPs. EPA establishes National Emission Standards for Hazardous Air Pollutants (NESHAPS)⁴ and New Source Performance Standards (NSPS).⁵ None of the current NESHAPS rules has any bearing on EOR production. The NSPS for petroleum storage vessels and fossil-fuel fired steam generators are set forth in Table 2-2. Note the limitations on the coverage of each rule.

2.2.2 New Source Permitting

The key factor for EOR in the current approach of the Clean Air Act is preconstruction review and permitting of all new major air pollution sources. In areas where the air is already cleaner than the NAAQS, the states must adopt programs for the Prevention of Significant Deterioration (PSD) of air quality.⁶ Preconstruction review and permitting is also required for new major sources in areas not yet attaining ambient standards (nonattainment areas) in order to guarantee steady progress toward the achievement of the standards.⁷ Both of these new source review programs will eventually be administered by the states, but until a state's program is approved, EPA will be responsible for the review and for issuing construction permits.

Because only a few SIPs have been approved, this section will provide a general description how EPA will conduct the new source review and permit program.⁸ The description is based on the latest EPA proposed rules; the final rules may vary to some extent.

1. Fossil-Fuel Fired Steam Generators of more than 250 MMBtu/hour heat input* 40 C.F.R. §60.40-46.

Particulate Matter: 0.10 lb/MBtu heat input
20% opacity; 6 minutes/hour not more than 27%

Sulfur Dioxide: 0.80 lb/MBtu heat input for liquid fuel
1.2 lb/MBtu heat input for solid fuel

Nitrogen Dioxide: 0.20 lb/MBtu heat input for gaseous fuel
0.30 lb/MBtu Heat input for liquid fuel
0.70 lb/MBtu heat input for solid fuel
(except lignite)

*These standards will be reviewed and revised by 1981.

2. Storage Vessels for Petroleum Liquids with a capacity greater than 40,000 gallons 40 C.F.R. §60.110-113

- Does not apply to storage vessels for petroleum or condensate stored, processed or treated at a drilling and production facility prior to custody transfer.
- "Petroleum" does not include No. 2 through No. 6 fuel oil or diesel fuels Nos. 2-D and 4-D.

Vapor pressure between 78 and 570 mm Hg: floating roof or
vapor recovery system
or equivalent hydro-
carbon control

Vapor pressure greater than 570 mm Hg: vapor recovery system
or equivalent hydro-
carbon control

PSD Review

1. Coverage

In areas that are attaining the NAAQS for one or more of the pollutants a facility will emit, PSD review will apply to those pollutants.

Only major sources or modifications to major sources will need PSD permits. For EOR, the following are the key definitions of "major" sources:

<u>Source Category</u>	<u>Emissions After Controls</u> <u>(Any Pollutant)</u>
<ul style="list-style-type: none">● Fossil-fuel boilers (or combinations) with more than 250 MMBtu/hr. heat input● Petroleum storage units of more than 300,000 barrels capacity	100 tons per year
All others	250 tons per year

If an existing source is already "major," any modification that increases the net emissions of any pollutant requires a PSD permit. Modifications to minor sources only require a permit if the aggregate emissions exceed the values shown above. For example, a modification to a boiler emitting 80 tons per year that will cause a net increase of 40 tons per year will require a permit.

Once a new source or modification is subject to PSD review, that review will include all emissions of any pollutant regulated by the Clean Air Act. As an example, a thermal EOR project with a boiler that will emit more than 100 tons per year of sulfur dioxide will also be subject to review for its emissions of particulate matter, hydrocarbons,

hydrogen sulfide, nitrogen dioxide, and any other pollutants. Only emissions of insignificant quantities will be exempt. Table 2-3 shows which pollutants may be subject to review, and what rates of emission are considered significant.

2. Application Requirements

Monitoring: The applicant must acquire acceptable data on the ambient air quality at the site for the 12 months preceding the application. If the data is not available from an existing monitor, the applicant will have to set up his own monitoring program. Monitoring data must be collected for all pollutants the source will emit for which there are EPA-approved monitoring methods. The applicant must also collect meteorological data to use in modeling the ambient air quality impact of the source. EPA has set standards for monitoring network design, quality assurance, instrument calibration, etc. The best approach is to have EPA regional office staff review and "approve" your monitoring plan.

Modeling: The applicant must predict the effect that the facility's emissions will have on ambient air quality in the vicinity. This is done by dispersion modeling using projected emission rates and local meteorological data as inputs. EPA has approved certain models for this purpose. Other models may be used if they are properly "validated" by comparison of model predictions and monitoring data. In regions of rough terrain or complex meteorology (e.g., coastal areas) EPA models tend to overestimate the ambient air quality impact.

Control Technology Review: Every new source locating in a PSD area must employ the best available control technology (BACT) for each emission point. The application for a PSD permit must identify the air pollution controls that will be used and demonstrate that those controls represent

TABLE 2-3. GUIDELINES FOR SIGNIFICANT EMISSION RATES

Pollutant	Emission Rate
Carbon Monoxide	100 tons per year
Nitrogen Dioxide	10 " " "
Total Suspended Particulates	10 " " "
Sulfur Dioxide	10 " " "
Ozone	10 " " " of volatile organic compounds
Lead	1 ton per year
Mercury*	0.2 " " "
Beryllium*	0.004 ton per year
Asbestos*	1 ton per year
Fluorides*	0.02 " " "
Sulfuric Acid Mist*	1 " " "
Vinyl Chloride*	1 " " "
Total Reduced Sulfur	
Hydrogen Sulfide*	1 " " "
Methyl Mercaptan*	1 " " "
Dimethyl Sulfide*	1 " " "
Dimethyl Disulfide*	1 " " "
Reduced Sulfur Compounds	
Hydrogen Sulfide (see above)	
Carbon Disulfide*	10 tons per year
Carbonyl Sulfide*	10 " " "

*non-criteria pollutants

BACT. EPA offices can supply you with guideline documents for making that demonstration. BACT review considers the cost of control, so in rare cases no pollution control equipment may be necessary.

Effect on Air Quality Related Values: If the source will affect a Class I area (see Figure 2-1), the applicant will also have to analyze the effect of the emission on the soils, vegetation, visibility, and other such values in the Class I area. In this case, the application will be reviewed by the federal land manager (the Department of the Interior or the Department of Agriculture). (A Class I area is an area where virtually no deterioration of air quality will be allowed to occur. The Clean Air Act designated certain federal lands, as shown on the map, as "mandatory" Class I areas. Other Class I areas may be established by Indian tribes or state governors. To date, only one such additional area exists: the Northern Cheyenne Indian Reservation in southeastern Montana.)

3. Agency Review Criteria

Ambient Air Quality Impact: EPA's principal concern is that the new source should not affect air quality to an unacceptable degree. Two limits are important (see Table 2-4): PSD increments and NAAQS. The PSD increments define the total allowable air quality impact at any one point for all new sources combined. Generally, a source will not be allowed to "consume" all of the increment by itself. If other sources have already consumed part of the increment, the applicant should model the combined effect of its emissions and the emissions from the other sources. In no case will EPA grant a permit to a source if it will cause a violation of the increment.

Figure 2-1

MANDATORY CLASS I AREAS

Table 2-4

ALLOWABLE AIR QUALITY INCREMENTS

Land Area Type	Maximum New Source Increment $\mu\text{g}/\text{m}^3$				
	SO ₂			TSP	
	3 Hour	24 Hour	Annual	24 Hour	Annual
• Nonattainment (NA)	< 0 (25)	< 0 (5)	< 0 (1)	< 0 (5)	< 0 (1)
• Prevention of Significant Deterioration (PSD)					
Class I	25	5	2	10	5
Class II	512	91	20	37	19
Class III	700	182	40	75	37
• National Ambient Air Quality Standards (NAAQS) Controlling	1300-P	365-P	80-P	260-P	75-P

Notes:

NA:

Values in parentheses are "significance levels." Ambient air quality impacts less than these values will be ignored.

PSD:

Class I: Pristine Areas (see text).

Class II: All areas not redesignated to Class I or Class III.

Class III: Certain areas may be redesignated Class III by the state governor in order to provide additional opportunity for industrial growth. No Class III redesignations have been made or proposed, and none are expected.

NAAQS:

P designates primary standard. NAAQS are ceilings on total concentrations, not increments above existing air quality.

If the existing air quality is near the NAAQS limits, then EPA will analyze the effect to ensure that the new source does not cause a violation of the NAAQS. If a non-attainment area is nearby, the applicant must also show no contribution to the violations in that area. This can be done by showing that the emissions from the new source do not blow toward the nonattainment area under the wind conditions associated with the violations. Alternatively, the new source can "offset" its contribution to the violation by obtaining a reduction in emissions from another source.

Nonattainment Area Review

At the moment, a complete prohibition on the construction of new major sources in nonattainment (NA) areas is in effect. The states must devise strategies to correct their nonattainment problems, and they have generally been late in doing so. However, over the next few months EPA will be granting approval to many state programs. This will remove the prohibition on construction (state-by-state) and transfer new source review authority in those areas to the states.

The minimum coverage of NA new source review is the same as for PSD review, except that it applies, of course, only to sources locating in NA areas. (Note, however, that state permit requirements usually cover small as well as large sources.) Monitoring will not be required, but modeling and technology review will. The technology review in NA areas is based on a more stringent requirement known as the lowest achievable emission rate (LAER). LAER may require technology transfer of pollution control systems, and gives less weight to cost than does BACT.

The basic requirement for a source locating in a NA area is to show that its construction will not impede programs towards attainment of the standards. The SIP may allow some short-term increases in pollution, but the long-

term trend must be downward. Typically, a new source in a NA area will have to "offset" its emissions by getting a nearby existing source to shut down or to reduce its emissions. For example, Volkswagen was allowed to build a plant in Pennsylvania by getting the state to change its highway paving materials to reduce hydrocarbon emissions and "offset" the effect of the new plant.

Permit Processing: To process a new source construction permit usually requires four to six months from the date of application. Complex cases can take a year or more. (For major new sources in PSD areas, of course, more than one year is required to conduct monitoring and modeling studies before submitting an application.) The agency has 30 days to review the application for completeness and to request any additional information. Once the application is complete, the agency will prepare a draft permit. Public notice of the draft permit is then published, and there is opportunity for the public to request a hearing. After comments have been received and a hearing (if any) held, the agency will issue a final permit. Only then may construction begin. EPA has proposed to consolidate the PSD permit with other EPA permits that may be required for the facility, including the underground injection control permit. This should save applicants time and paperwork. Even if EPA issues one permit and the state agency another, some consolidation may be possible.

Footnotes

1. 42 U.S.C. §§7401-7642.
2. Clean Air Act, §109, 42 U.S.C. §7409.
3. Clean Air Act, §110, 42 U.S.C. §7410.
4. Clean Air Act, §112, 42 U.S.C. §7412
5. Clean Air Act, §111, 42 U.S.C. §7411.
6. 40 C.F.R. §51.24, 43 Fed. Reg. 26382, June 19, 1978. Complex litigation challenging the regulations has not been finally resolved. See Alabama Power Co. v. Costle, D.C. Cir., June 18, 1979, No. 781006. On September 5, 1979, EPA proposed substantial changes to the PSD rules. (44 Fed. Reg. 51924) Final changes should be made in early 1980.
7. 40 C.F.R. Part 51, Appendix S, 44 Fed. Reg. 3282, January 16, 1979. The September 5 proposed rules (see Footnote 6) will also amend parts of this ruling.
8. EPA's rules for its own program (40 C.F.R. §52.21) are somewhat stricter than its standards for state program approval.

3. WATER POLLUTION CONTROL

3.1 Introduction

The federal Clean Water Act¹ is the basic law governing water pollution control requirements. As with air pollution, however, the federal government encourages states to assume administrative responsibility for the program, and more than half the states have done so. Moreover, every state has its own water pollution control laws and regulations, which may impose additional or stricter requirements than the Clean Water Act.

Oil activities, including EOR operations, generate a variety of waste waters, generally classified as follows:

- Produced water
- Deck drainage
- Drilling muds
- Drill cuttings
- Well treatment
- Sanitary Waste
- Domestic waste

EOR operations may generate additional wastewater from boiler blowdown or preparation and recovery of chemicals. As described in Section 3.2, federal regulations severely restrict the surface discharge of oil production waste water, except for sanitary and domestic wastes. Therefore this chapter will not provide the same detail on state rules as others in the handbook.

Apart from limitations on discharge of wastewater, three other aspects of water pollution control demand our attention: 1) the special procedural rules that govern permit issuance under the National Pollutant Discharge Elimination

System; 2) the rules on spill prevention and reporting and clean-up of spills; and 3) the requirements to obtain permits for construction of facilities in navigable waters or any dredging or filling in any waters of the United States. These aspects are covered in Sections 3.3, 3.4, and 3.5.

3.2 Limitations on Wastewater Discharge

3.2.1 General Scheme of Clean Water Act

The Clean Water Act establishes a two-tiered system of controls on water pollution. The first tier is direct controls on the discharge, the second is standards for the quality of the receiving water.

Effluent Limitations

The effluent limitations, or effluent guidelines as they are often called, set legally-binding nationwide limits on the levels of discharge of various pollutants from each industrial source category.² The specific limitations for the Oil and Gas Extraction Point Source Category are described below. There are two degrees of effluent limitations. The first is called best practicable control technology currently available, abbreviated BPT. BPT levels were to have been achieved by July 1, 1977, and must be achieved by any technology economically achievable (BAT). Currently, there are no BAT standards for oil wells, and none may be developed because of the relatively benign nature of oil and grease pollution.³ However, oil operators are legally required to prevent pollution through the use of the "best conventional pollutant control technology" (that is, those methods that are available and considered "standard" for the industry).

A special type of limitation that may become important for chemical EOR operations is the toxic effluent standard.⁴ EPA may set specific stringent limits on the amount of discharge of a toxic substance by any point source, regardless of the industry effluent limitation. To date, only a few such standards have been set.^{4a} If a toxic effluent standard is established in the future for a pollutant that appears in your discharge, you will have one year to control or remove that pollutant.

Water Quality Standards

In some cases, the effluent limitations will not be sufficient to protect the water quality of the receiving water. This will most frequently occur along heavily industrialized rivers or in arid areas with low stream flow. In such cases, stricter controls may be required to achieve water quality standards.⁵

Water quality standards are set by the state (subject to EPA review) for every water body and every stream or stream segment in the state. The state agency can tell you the standards for any particular lake, stream or bay -- they are too detailed to present here. 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.

3.2.2 EPA Effluent Limitations for Oil Wells

EPA promulgated the current set of limitations for the "Oil and Gas Extraction Point Source Category" on April 13, 1979.⁶ The rules segment the category into four subcategories: offshore, coastal, onshore, and stripper. Stripper wells are defined as wells in a field where the average

production per well is 10 barrels/day or less, excluding wells injecting water for disposal. Thus, virtually all EOR wells will fall into one of the three other subcategories.

The offshore subcategory includes all wells seaward of the inner limits of the territorial sea. This covers all offshore areas except small bays, inlets, areas immediately along the coast if there are islands or capes nearby. For example, most of the Santa Barbara Channel is "offshore," but Cook Inlet in Alaska is not.

The coastal subcategory includes facilities operating over any body or wetland landward of the territorial sea. Thus, the wells in Cook Inlet are "coastal," as are wells in many areas along the Gulf Coast, such as Louisiana's Lake Pontchartrain. The inclusion of coastal wetlands and inland lakes and wetlands in the definition makes this subcategory much broader than the term "coastal" implies.

The onshore subcategory, of course, contains all facilities that are neither offshore nor coastal. Note that onshore facilities west of the 98th meridian (which bisects Texas, Oklahoma and Kansas) may be eligible for special limits: the rules contain a special provision for agricultural and wildlife use, which relaxes the effluent limitations on produced water for facilities in western states that provide their produced water for livestock watering, agricultural use, or wildlife propagation.

The effluent limitations that apply to oil wells and associated facilities in each subcategory are shown in Table 3-1. No discharges above these limits will be allowed with the single exception of discharges from sources that can demonstrate that their operations are "fundamentally different" from the types of operations on which the standards are based. This so-called "fundamentally different factors variance" is extremely difficult to substantiate

and procedurally time-consuming to obtain, but may be useful for innovative types of recovery processes with unusual wastewater streams.

Table 3-1

EPA Effluent Limitations for Oil and Gas Extraction

(44 Fed. Reg. 22069, 40 C.F.R. Part 435)

Subcategory: Onshore

"No discharge of waste water pollutants into [waters of the United States] from any source associated with production, field exploration, drilling, well completion, or well treatment (i.e., produced water, drilling muds, drill cuttings, and produced sand)."

Special Provision for agricultural or wildlife water use:

No discharge of drilling muds, drill cuttings, and produced sands.

Produced water discharges not to exceed 35 mg/l of oil and grease, daily maximum limitation.

Subcategory: Coastal and Offshore

Produced water: 72 mg/l oil and grease, daily maximum
48 mg/l oil and grease, 30-day average

Deck drainage: pending

Drilling muds: pending

Drill cuttings: pending

Well treatment: No discharge of free oil (no sheen on water).

Sanitary waste: Minimum 1 mg/l residual chlorine

Sanitary waste (less than 10 persons)

Domestic wates: No floating solids.

3.3 NPDES Permit

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 (see Table 1-2) 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.

In June, 1979, EPA published final rules revising the procedures for NPDES permit application, review, issuance, and appeal.⁷ Like the proposed consolidated permit rules described in Chapter 1 (of which they will become a part), the NPDES rules are presented in three sections. One describes the general scheme of the NPDES, one prescribes the minimum requirements for state program approval, and one provides the details of EPA's decision-making procedures.

3.3.1 General Provisions

Coverage

The first item to note is the comprehensive coverage of the NPDES program. It applies to discharges to any waters of the United States, including ponds, marshes, swamps, intermittent streams, and even dry stream beds that occasionally carry water to other rivers or streams.

Application

Anyone who proposes to discharge pollutants must apply for a permit at least 180 days in advance. The application form must be signed by an executive officer of the level of Vice President (for a corporation), a general partner (for a partnership), or the proprietor of a sole proprietorship.

The application form calls for a complete description of the location of the discharge, the name of the receiving water, the composition of the discharge, the volume of the discharge, and the source of the pollutants (e.g., well treatment; sanitary waste). It is important to identify every pollutant and its concentration in the waste stream; if the permit does not set limits on pollutants named in the application, those pollutants may be discharged up to the levels or concentration declared in the application.

In some cases, actual permits for discharges from oil wells may not be issued. In this situation, the application on file becomes the source's permit. This is another reason to describe your discharge as completely as possible.

Terms and Conditions

An NPDES permit is good for a fixed period of time, usually five years. If the discharge will continue beyond the permit expiration date, the source must file a renewal application at least 180 days in advance. If a renewal application is filed on time, the old permit stays in effect until a new one is issued. Without a renewal application, the old permit will expire and the discharge must stop.

The permit will cover three key items:

- identity of all pollutants
- limits on discharges of all pollutants (daily maximum values and/or monthly average values) and an overall limit on the volume of the discharge
- sampling, testing, and reporting requirements to monitor compliance.

If new pollution control equipment is needed, the permit may also set a schedule for its installation and operation.

The limitations on the discharges must be at least as strict as the effluent guidelines and the water quality standards require. As long as the source meets all the conditions of the permit, it will be immune from any enforcement for violation of the Clean Water Act. The permit may be modified or revoked only for cause, such as violation of the permit, misrepresentations in the permit application, or a threat to human health. In addition, substantial alterations in the facility or the discharge may also trigger a permit modification (but not a revocation).

Other general conditions include a statement of the right of environmental officials to enter the facility to inspect the facility or its records or to sample the effluent, and a requirement to report violations of the permit within 30 days, or within 24 hours if there is a health danger.

Environmental Assessment Procedures: A Future Possibility

Most federal environmental statutes exempt EPA's decisions on permits from the environmental impact statement (EIS) requirements of the National Environmental Policy Act (NEPA). The Clean Water Act is an exception. Before issuing a NPDES permit to any new source in a category for which it has proposed and promulgated standards of performance for new sources, EPA must comply with NEPA.⁸ Compliance involves, at a minimum, performance of an environmental review and preparation of a so-called "negative declaration," a statement explaining why a full EIS is not necessary. For large-scale projects or projects in sensitive ecological areas (e.g., wetlands), a full EIS may be required, which will analyze not only the water quality impacts of the

project, but its effects on air, wildlife, land use, the local community, and so forth.⁹

We flag the environmental assessment requirement as an area for future concern because oil production falls into an industrial category for which EPA has proposed new source performance standards. As of mid-1979, the Agency expressed an intention to review comments received on its initial proposal and reassess the proposed standards. The likely consequence of such a review is a re-proposal of standards, at an indefinite time in the future, with final promulgation six months to a year later. Only facilities that commence construction after the proposal date of rules that are finally adopted will be classified as new sources.

3.3.2 Permitting Procedures

The rules prescribing EPA's decision-making procedures for NPDES permits are very detailed and explicit. They cover everything from what documents may become part of the official record to the information that must be supplied on a petition for review addressed to the EPA Administrator.

Figure 3-1 outlines the general scheme and time frame of the procedures. Much of the detail in the rules give instructions to EPA staff about their role in the process. The key points for applicants to note are the three major opportunities for them to participate in the process: the permit application itself; the public comment and hearing on the draft permit; and the evidentiary hearing.

The Permit Application

In addition to filling in the required information on the permit application, you may submit to EPA any descriptive, technical, legal, or other supporting document that

FIGURE 3-1

you think will facilitate EPA's review or strengthen your case. If your facility, its discharge, or your control technology is unusual in any respect, it is advisable to supply such supporting documentation. In some cases, you may even want to ask for a meeting with the agency to make a presentation about your facility and answer their questions.

Public Comments and the Public Hearing

The agency must publish a public notice of every tentative decision on a permit application. If the decision is to issue a permit, the agency should send a copy of the draft and the supporting explanation to the permit applicant. Scrutinize the draft and use the public comment period to raise any question or objections you have about the draft permit. If you have objections that can best be presented at a hearing, and you have a supportive, or at least neutral, local community, request a public hearing. Under the EPA procedures, you must raise your points at this stage if you want to take advantage of later opportunities to appeal the final decision.

The public hearing held at this stage is an informal affair at which any person may make a statement about the pending permit application. There may be some casual questioning addressed to speakers by EPA staff, but there is no cross-examination, taking of oaths, or other formal procedure. If a hearing is held, whether you requested it or not, you should at least attend the hearing; better yet, prepare and deliver a statement of your own describing your proposal and its merits.

The Evidentiary Hearing

After the public comment period and public hearing, the agency will make a final decision. Should the agency

deny your permit application, or place unreasonable conditions in the final permit, you will have 30 days from the day of notice of the final decision to request an evidentiary hearing (State regulations have similar administrative appeals procedures.) Remember that under the EPA rules, you may only raise issues that you raised during the public comment period. Your hearing request must state the specific issues on which you request a hearing and the basis for your objection to the decision.

The evidentiary hearing is a formal proceeding, conducted much as a trial, with an administrative law judge appointed as presiding officer. Because of its formality, it is usually a time-consuming process. As Figure 3-1 indicates, a typical hearing takes a full year from hearing request to final decision; an appeal to the Administrator will add another 3 to 6 months. Clearly, it is best to avoid a hearing if at all possible by raising and resolving issues of dispute early in the process.

3.4 Spills and Spill Prevention

3.4.1 Oil

Reporting Oil Spills

Any spill of oil of any volume where the oil does or can enter any water (including wetlands) must be reported immediately upon discovery to the federal government, and usually to the state government as well. The U.S. Coast Guard maintains a 24-hour toll-free telephone line for receiving spill reports; the number is (800) 424-8802. Failure to report a spill may be penalized or punished as a criminal offense and enforcement of this requirement is relatively strict. Spills must be reported regardless of how the spill occurred or who was at fault. Only spills

that physically cannot enter any water body or stream bed are exempt from the reporting requirement.

The Coast Guard or EPA (depending on the spill site) will assess a civil penalty for a spill. The penalty amount is usually less than \$5000 except in the case of very large spills or in cases of clear negligence or intentional spilling.

Containment and Clean-Up

The owner of the source of the spill is responsible for the costs of containment and clean-up. The usual procedure is for the spiller to hire a clean-up contractor to do the work. If the spiller fails to take immediate steps, the federal government will hire a contractor and then seek to recover the costs from the spiller. In either case, federal "on-scene co-ordinators" will technically supervise the clean-up and containment. The federal officials may also direct measures to mitigate or prevent environmental damage from the spill.

The rules set limits on liability for facilities with storage capacities of 1,000 barrels or less, ranging from \$4000 for facilities with 10 barrel or less above ground storage to \$260,000 for facilities with 501-1,000 barrels underground storage.¹⁰ However, if daily throughput exceeds the storage capacity, the limits do not apply.¹¹

Any facility from which oil could enter U.S. waters with a total oil storage capacity of more than 1320 gallons above ground, or with any single above-ground tank of more than 660 gallons must prepare a Spill Prevention, Control, and Countermeasure (SPCC) plan.¹² The plan must be certified by a registered professional engineer, and a copy of it kept at the facility. EPA or state inspectors may ask to

see the plan and may inspect your facility to see that all parts of the plan have been carried out. Failure to have a plan will probably result in a penalty of \$500-\$5000 (depending on the storage capacity) and an order to prepare one.

At a minimum, an SPCC plan should include one of the following components:

1. Impervious dikes, berms, or walls to contain spilled oil.
2. Curbing.
3. Culverts, gutters, or other drainage systems.
4. Weirs, booms, or other barriers.
5. Spill diversion ponds.
6. Retention ponds.
7. On-site sorbent materials.

The EPA regulations also contain guidelines for adequate SPCC plans for oil production facilities. These guidelines address spill prevention from storage, transfer, and drilling, and recommend a variety of measures, such as:

- Sealed dikes and collection of oil accumulated on rainwater before drainage.
- Periodic inspection of drainage systems, storage tanks, above-ground joints, valves, and pipelines.
- Frequent inspection of brine disposal facilities, especially following sudden temperature changes.
- Positioning of drilling equipment to prevent spilled oil from reaching water, or catchment basins and division structures to contain spills.
- Use of blowout prevention assemblies in accordance with state regulatory requirements.

3.4.2. Hazardous Substances

Reporting Spills, Containment and Clean-Up

Operators of chemical EOR facilities also need to be concerned with EPA's rules on spills of hazardous substances.¹³ These rules identify 299 hazardous substances, which they 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 pound; for the fifth, 5000 pounds. The full list is given in Table 3-2. The reporting requirements, clean-up and containment responsibilities, and liabilities for costs and penalties are generally the same as for oil spills (see Section 3.4.1).

Spill Prevention: Best Management Practices

Facilities handling or storing toxic substances (which include most substances on the "hazardous" list) may be required to adopt so-called "best management practices" to prevent run-off, drainage, or spills of toxic substances.¹⁴ EPA is to determine best management practices for each industrial category and require their implementation through the NPDES permits. At this time, there are no prescribed best management practices for oil production facilities.

3.5 Corps of Engineers Permits

3.5.1 Dredge and Fill (Section 404 Permits)

Section 404 of the Clean Water Act authorizes the Corps of Engineers to issue permits for the discharge of dredge

Table 3-2. Reportable Quantities of Hazardous Substances

Material	Category	RQ in pounds (kilograms)	Material	Category	RQ in pounds (kilograms)
Antimony potassium tartrate.....	C	1,000 (454)	Epichlorohydrin.....	C	1,000 (454)
Antimony tribromide.....	C	1,000 (454)	Ethanol.....	A	10 (4.54)
Antimony trichloride.....	C	1,000 (454)	Ethylbenzene.....	C	1,000 (454)
Antimony trifluoride.....	C	1,000 (454)	Ethylenediamine.....	C	1,000 (454)
Antimony trioxide.....	D	5,000 (2,270)	Ethylene dibromide.....	C	1,000 (454)
Arsenic disulfide.....	D	5,000 (2,270)	Ethylene dichloride.....	D	5,000 (2,270)
Arsenic pentoxide.....	D	5,000 (2,270)	EDTA.....	D	5,000 (2,270)
Arsenic trichloride.....	D	5,000 (2,270)	Ferric ammonium citrate.....	C	1,000 (454)
Arsenic trioxide.....	D	5,000 (2,270)	Ferric ammonium oxalate.....	C	1,000 (454)
Arsenic trisulfide.....	D	5,000 (2,270)	Ferric chloride.....	C	1,000 (454)
Barium cyanide.....	A	10 (4.54)	Ferric fluoride.....	B	100 (45.4)
Benzene.....	C	1,000 (454)	Ferric nitrate.....	C	1,000 (454)
Benzoic acid.....	D	5,000 (2,270)	Ferric sulfate.....	C	1,000 (454)
Benzonitrile.....	C	1,000 (454)	Ferrous ammonium sulfate.....	C	1,000 (454)
Benzoyl chloride.....	C	1,000 (454)	Ferrous chloride.....	B	100 (45.4)
Benzyl chloride.....	B	100 (45.4)	Ferrous sulfate.....	C	1,000 (454)
Beryllium chloride.....	D	5,000 (2,270)	Formaldehyde.....	C	1,000 (454)
Beryllium fluoride.....	D	5,000 (2,270)	Formic acid.....	D	5,000 (2,270)
Beryllium nitrate.....	D	5,000 (2,270)	Fumaric acid.....	D	5,000 (2,270)
Butyl acetate.....	D	5,000 (2,270)	Furfural.....	C	1,000 (454)
n-Butyl phthalate.....	B	100 (45.4)	Guthion.....	X	1 (0.454)
Butylamine.....	C	1,000 (454)	Heptachlor.....	X	1 (0.454)
Butyric acid.....	D	5,000 (2,270)	Hexachlorocyclopentadiene.....	X	1 (0.454)
Cadmium acetate.....	B	100 (45.4)	Hydrochloric acid.....	D	5,000 (2,270)
Cadmium bromide.....	B	100 (45.4)	Hydrofluoric acid.....	D	5,000 (2,270)
Cadmium chloride.....	B	100 (45.4)	Hydrogen cyanide.....	A	10 (4.54)
Calcium arsenate.....	C	1,000 (454)	Hydrogen sulfide.....	B	100 (45.4)
Calcium arsenite.....	C	1,000 (454)	Isoprene.....	C	1,000 (454)
Calcium carbide.....	D	5,000 (2,270)	Isopropanolamine.....	C	1,000 (454)
Calcium chromate.....	C	1,000 (454)	dodecylbenzenesulfonate.....		
Calcium cyanide.....	A	10 (4.54)	Kelthane.....	D	5,000 (2,270)
Calcium.....	C	1,000 (454)	Kepone.....	X	1,000 (454)
dodecylbenzenesulfonate.....			Lead acetate.....	D	5,000 (2,270)
Calcium hydroxide.....	D	5,000 (2,270)	Lead arsenate.....	D	5,000 (2,270)
Calcium hypochlorite.....	B	100 (45.4)	Lead chloride.....	D	5,000 (2,270)
Calcium oxide.....	D	5,000 (2,270)	Lead fluoroborate.....	D	5,000 (2,270)
Caplan.....	A	10 (4.54)	Lead fluoride.....	C	1,000 (454)
Carbaryl.....	B	100 (45.4)	Lead iodide.....	D	5,000 (2,270)
Carbofuran.....	A	10 (4.54)	Lead nitrate.....	D	5,000 (2,270)
Carbon disulfide.....	D	5,000 (2,270)	Lead stearate.....	D	5,000 (2,270)
Carbon tetrachloride.....	D	5,000 (2,270)	Lead sulfate.....	D	5,000 (2,270)
Chlordane.....	X	1 (0.454)	Lead sulfide.....	D	5,000 (2,270)
Chlorine.....	A	10 (4.54)	Lead thiocyanate.....	D	5,000 (2,270)
Chlorobenzene.....	B	100 (45.4)	Lindane.....	X	1 (0.454)
Chloroform.....	D	5,000 (2,270)	Lithium chromate.....	C	1,000 (454)
Chlorpyrifos.....	X	1 (0.454)	Malathion.....	A	10 (4.54)
Chlorosulfonic acid.....	C	1,000 (454)	Maleic acid.....	D	5,000 (2,270)
Chromic acetate.....	C	1,000 (454)	Maleic anhydride.....	D	5,000 (2,270)
Chromic acid.....	C	1,000 (454)	Mercaptodimethur.....	B	100 (45.4)
Chromic sulfate.....	C	1,000 (454)	Mercuric cyanide.....	X	1 (0.454)
Chromous chloride.....	C	1,000 (454)	Mercuric nitrate.....	A	10 (4.54)
Cobaltous bromide.....	C	1,000 (454)	Mercuric sulfate.....	A	10 (4.54)
Cobaltous formate.....	C	1,000 (454)	Mercuric thiocyanate.....	A	10 (4.54)
Cobaltous sulfamate.....	C	1,000 (454)	Mercurous nitrate.....	A	10 (4.54)
Coumaphos.....	A	10 (4.54)	Methoxychlor.....	X	1 (0.454)
Cresol.....	C	1,000 (454)	Methyl mercaptan.....	B	100 (45.4)
Crotonaldehyde.....	B	100 (45.4)	Methyl methacrylate.....	D	5,000 (2,270)
Cupric acetate.....	B	100 (45.4)	Methyl parathion.....	B	100 (45.4)
Cupric acetoarsenite.....	B	100 (45.4)	Mevinphos.....	X	1 (0.454)
Cupric chloride.....	A	10 (4.54)	Maxacarbate.....	C	1,000 (454)
Cupric nitrate.....	B	100 (45.4)	Monothylamine.....	C	1,000 (454)
Cupric oxalate.....	B	100 (45.4)	Monomethylamine.....	C	1,000 (454)
Cupric sulfate.....	A	10 (4.54)	Naled.....	A	10 (4.54)
Cupric sulfate ammoniated.....	B	100 (45.4)	Naphthalene.....	D	5,000 (2,270)
Cupric tartrate.....	B	100 (45.4)	Naphthenic acid.....	B	100 (45.4)
Cyanogen chloride.....	A	10 (4.54)	Nickel ammonium sulfate.....	D	5,000 (2,270)
Cyclohexane.....	C	1,000 (454)	Nickel chloride.....	D	5,000 (2,270)
2,4-D Acid.....	B	100 (45.4)	Nickel hydroxide.....	C	1,000 (454)
2,4-D Esters.....	B	100 (45.4)	Nickel nitrate.....	D	5,000 (2,270)
DDT.....	X	1 (0.454)	Nickel sulfate.....	D	5,000 (2,270)
Diazinon.....	X	1 (0.454)	Nitric acid.....	C	1,000 (454)
Dicamba.....	C	1,000 (454)	Nitrobenzene.....	C	1,000 (454)
Dichlobenil.....	C	1,000 (454)	Nitrogen dioxide.....	C	1,000 (454)
Dichlorone.....	X	1 (0.454)	Nitrophenol.....	C	1,000 (454)
Dichlorobenzene.....	B	100 (45.4)	Nitrotoluene.....	C	1,000 (454)
Dichloropropane.....	D	5,000 (2,270)	Paraformaldehyde.....	C	1,000 (454)
Dichloropropene.....	D	5,000 (2,270)	Parathion.....	X	1 (0.454)
Dichloropropene.....	D	5,000 (2,270)	Pentachlorophenol.....	A	10 (4.54)
Dichloropropene.....	D	5,000 (2,270)	Phenol.....	C	1,000 (454)
Dichloropropene Mixture.....	D	5,000 (2,270)	Phosgene.....	D	5,000 (2,270)
2,2-Dichloropropionic acid.....	D	5,000 (2,270)	Phosphoric acid.....	D	5,000 (2,270)
Dichlorvos.....	A	10 (4.54)	Phosphorus.....	X	1 (0.454)
Dieldrin.....	X	1 (0.454)	Phosphorus oxychloride.....	D	5,000 (2,270)
Diethylamine.....	C	1,000 (454)	Phosphorus pentasulfide.....	B	100 (45.4)
Dimethylamine.....	C	1,000 (454)	Phosphorus trichloride.....	D	5,000 (2,270)
Dinitrobenzene.....	C	1,000 (454)	Polychlorinated biphenyls.....	A	10 (4.54)
Dinitrophenol.....	C	1,000 (454)	Potassium arsenate.....	C	1,000 (454)
Dinitrotoluene.....	C	1,000 (454)	Potassium arsenite.....	C	1,000 (454)
Diquat.....	C	1,000 (454)	Potassium bichromate.....	C	1,000 (454)
Disulfoton.....	X	1 (0.454)	Potassium chromate.....	C	1,000 (454)
Diuron.....	B	100 (45.4)	Potassium cyanide.....	A	10 (4.54)
Dodecylbenzenesulfonic acid.....	C	1,000 (454)	Potassium hydroxide.....	C	1,000 (454)
Endosulfan.....	X	1 (0.454)	Potassium permanganate.....	B	100 (45.4)
Endrin.....	X	1 (0.454)			

§ 117.3 Determination of reportable quantities.

The quantity listed with each substance in Table 117.3 is determined to be the reportable quantity for that substance.

Table 117.3—Reportable Quantities of Hazardous Substances

Note.—The first number under the column headed "RQ" is the reportable quantity in pounds. The number in parentheses is the metric equivalent in kilograms. For convenience, the table contains a column headed "Category" which lists the code letters "X", "A", "B", "C" and "D" associated with reportable quantities of 1, 10, 100, 1000 and 5000 pounds respectively.

Material	Category	RQ in pounds (kilograms)
Acetaldehyde.....	C	1,000 (454)
Acetic acid.....	C	1,000 (454)
Acetic anhydride.....	C	1,000 (454)
Acetone cyanohydrin.....	A	10 (4.54)
Acetyl bromide.....	D	5,000 (2,270)
Acetyl chloride.....	D	5,000 (2,270)
Acrolein.....	X	1 (0.454)
Acrylonitrile.....	B	100 (45.4)
Adipic acid.....	D	5,000 (2,270)
Aldrin.....	X	1 (0.454)
Allyl alcohol.....	B	100 (45.4)
Allyl chloride.....	C	1,000 (454)
Aluminum sulfate.....	D	5,000 (2,270)
Ammonia.....	B	100 (45.4)
Ammonium acetate.....	D	5,000 (2,270)
Ammonium benzoate.....	D	5,000 (2,270)
Ammonium bicarbonate.....	D	5,000 (2,270)
Ammonium bichromate.....	C	1,000 (454)
Ammonium bifluoride.....	D	5,000 (2,270)
Ammonium bisulfite.....	D	5,000 (2,270)
Ammonium carbamate.....	D	5,000 (2,270)
Ammonium carbonate.....	D	5,000 (2,270)
Ammonium chloride.....	D	5,000 (2,270)
Ammonium chromate.....	C	1,000 (454)
Ammonium citrate.....	D	5,000 (2,270)
Ammonium fluoroborate.....	D	5,000 (2,270)
Ammonium fluoride.....	D	5,000 (2,270)
Ammonium hydroxide.....	C	1,000 (454)
Ammonium oxalate.....	D	5,000 (2,270)
Ammonium silicofluoride.....	C	1,000 (454)
Ammonium sulfamate.....	D	5,000 (2,270)
Ammonium sulfide.....	D	5,000 (2,270)
Ammonium sulfate.....	D	5,000 (2,270)
Ammonium tartrate.....	D	5,000 (2,270)
Ammonium thiocyanate.....	D	5,000 (2,270)
Ammonium thiosulfate.....	D	5,000 (2,270)
Amyl acetate.....	C	1,000 (454)
Aniline.....	C	1,000 (454)
Antimony pentachloride.....	C	1,000 (454)

Table 3-2 (cont.)

Material	Category	RO in pounds (kilograms)
Propargite	A	10 (4.54)
Propionic acid	D	5,000 (2,270)
Propionic anhydride	D	5,000 (2,270)
Propylene oxide	D	5,000 (2,270)
Pyrethrin	C	1,000 (454)
Quinoline	C	1,000 (454)
Resorcinol	C	1,000 (454)
Selenium oxide	C	1,000 (454)
Silver nitrate	X	1 (0.454)
Sodium	C	1,000 (454)
Sodium arsenate	C	1,000 (454)
Sodium arsenite	C	1,000 (454)
Sodium bichromate	C	1,000 (454)
Sodium bromide	D	5,000 (2,270)
Sodium bisulfite	D	5,000 (2,270)
Sodium chromate	C	1,000 (454)
Sodium cyanide	A	10 (4.54)
Sodium	C	1,000 (454)
dodecylbenzenesulfonate		
Sodium fluoride	D	5,000 (2,270)
Sodium hydrosulfide	D	5,000 (2,270)
Sodium hydroxide	C	1,000 (454)
Sodium hypochlorite	B	100 (45.4)
Sodium methylate	C	1,000 (454)
Sodium nitrite	B	100 (45.4)
Sodium phosphate, dibasic	D	5,000 (2,270)
Sodium phosphate, tribasic	D	5,000 (2,270)
Sodium selenite	C	1,000 (454)
Strontium chromate	C	1,000 (454)
Strychnine	A	10 (4.54)
Styrene	C	1,000 (454)
Sulfuric acid	C	1,000 (454)
Sulfur monochloride	C	1,000 (454)
2,4,5-T acid	B	100 (45.4)
2,4,5-T amines	B	100 (45.4)
2,4,5-T esters	B	100 (45.4)
2,4,5-T salts	B	100 (45.4)
2,4,5-TP acid	B	100 (45.4)
2,4,5-TP acid esters	B	100 (45.4)
TDE	X	1 (0.454)
Tetraethyl lead	B	100 (45.4)
Tetraethyl pyrophosphate	B	100 (45.4)
Thallium sulfate	C	1,000 (454)
Toluene	C	1,000 (454)
Toxaphene	X	1 (0.454)
Trichlorfon	C	1,000 (454)
Trichloroethylene	C	1,000 (454)
Trichlorophenol	A	10 (4.54)
Triethanolamine	C	1,000 (454)
dodecylbenzenesulfonate		
Trimethylamine	D	5,000 (2,270)
Trimethylamine	C	1,000 (454)
Uranyl acetate	D	5,000 (2,270)
Uranyl nitrate	D	5,000 (2,270)
Vanadium pentoxide	C	1,000 (454)
Vanadyl sulfate	C	1,000 (454)
Vinyl acetate	C	1,000 (454)
Vinylidene chloride	D	5,000 (2,270)
Xylene	C	1,000 (454)
Xylenol	C	1,000 (454)
Zinc acetate	C	1,000 (454)
Zinc ammonium chloride	D	5,000 (2,270)
Zinc borate	C	1,000 (454)
Zinc bromide	D	5,000 (2,270)
Zinc carbonate	C	1,000 (454)
Zinc chloride	D	5,000 (2,270)
Zinc cyanide	A	10 (4.54)
Zinc fluoride	C	1,000 (454)
Zinc formate	C	1,000 (454)
Zinc hydrosulfite	C	1,000 (454)
Zinc nitrate	D	5,000 (2,270)
Zinc phenolsulfonate	D	5,000 (2,270)
Zinc phosphide	C	1,000 (454)
Zinc silicofluoride	D	5,000 (2,270)
Zinc sulfate	C	1,000 (454)
Zirconium nitrate	D	5,000 (2,270)
Zirconium potassium fluoride	D	5,000 (2,270)
Zirconium sulfate	D	5,000 (2,270)
Zirconium tetrachloride	D	5,000 (2,270)

or fill material into U.S. waters. Thus, any EOR operation that will involve construction work in any pond, lake, river, wetland, or salt water must obtain a 404 permit for the construction activity. Application for such a permit should be made to the district office of the Corps having jurisdiction over the water body.¹⁵ The Corps requires detailed engineering and site plans, and a detailed description of the dredge or fill material and its handling. In addition, if the proposed activity may have a substantial environmental effect (e.g., sedimentation in a shellfish area; turbidity harmful to local fish) the applicant should supply any data or studies it has obtained to assist the Corps in its environmental review of the project. If the project is located in the coastal zone, the applicant must provide state certification that the proposal is consistent with a federally-approved coastal zone management plan.

When the Corps receives a permit application, it notifies nearby landowners as well as state and local agencies, such as fish and game departments, that may have an interest. It also notifies the federal EPA, Fish and Wildlife Service, and National Marine Fisheries Service. Unless an agency opposes the project or the Corps finds engineering or environmental flaws in the application, approval should only require two or three months.

3.5.2 Construction (Section 10 Permits)

Section 10 of the Rivers and Harbors Appropriation Act of 1899¹⁶ prohibits the construction without a permit of any structure or other impediment to navigation in traditionally navigable water (i.e., major rivers, Great Lakes, bays, estuaries and coastal waters). This covers construction of drilling and production platforms in coastal waters, and also construction of associated docks or piers. The procedures for applying for and receiving such a permit are the same as for dredge and fill permits.

Footnotes

Chapter 3

1. 33 U.S.C. §§1251-1376
2. Clean Water Act, §304, 33 U.S.C. §1314. The effluent guidelines are collected in the Code of Federal Regulations at 40 C.F.R. Subchapter N (Parts 400-460).
3. The 1977 Amendments to the Act introduced the concept of "conventional pollutants" -- pollutants discharged in large quantities with relatively little harmful effect. §304(a)(4), 33 U.S.C. §1314(a)(4). Such pollutants do not need to be controlled with "best available technology," but are subject instead to a lesser degree of control called "best conventional pollutant control technology," BCT. §304(b)(4), 33 U.S.C. § 1314(b)(4). EPA has classified oil and grease as "conventional" pollutants.
4. Clean Water Act, §307(a), 33 U.S.C. §1317(a).
- 4a. At present, the list of toxic substances subject to effluent standards is limited to the following organics: aldrin/dieldrin; DDT; endrin; toxaphene; benzidene, and polychlorinated biphenyls (PCBs). 40 C.F.R. Part 129.
5. Clean Water Act, §303, 33 U.S.C. §1313.
6. 44 Fed. Reg. 22069 (April 13, 1979); 40 C.F.R. Part 435.
7. 44 Fed. Reg. 32854 (June 7, 1979); 40 C.F.R. Parts 121-125.
8. Clean Water Act, §511(c), 33 U.S.C. §1371(c).
9. 43 Fed. Reg. 55978 (Nov. 29, 1978); 40 C.F.R. Parts 1500-1508.
10. 40 C.F.R. Part 113.
11. 40 C.F.R. §113.5
12. 40 C.F.R. Part 112 establishes the program requirements. 40 C.F.R. Part 114 sets the penalties for violations.
13. 44 Fed. Reg. 50766, (Aug. 29, 1979) 40 C.F.R. Part 117.

14. "Best management practices" rules are authorized by §304(e) of the Clean Water Act, 33 U.S.C. §1314(e.)
15. The Corps permit form is designated ENG 4345. The full regulations for the Corps program are found at 33 C.F.R. Parts 320-329.

4. PROTECTING DRINKING WATER: UNDERGROUND INJECTION CONTROL

4.1 Introduction

Of all environmental protection regulations, the emerging federal underground injection control (UIC) program will affect EOR operations most directly. The UIC program will regulate the "subsurface emplacement of fluids (except drilling muds, cement and similar construction materials)." This covers production injection for all EOR processes, as well as the underground disposal of produced water and other waste materials from any EOR operation.

The UIC program grows out of a specific directive in the federal Safe Drinking Water Act.¹ As with other pollution control programs, the U.S. EPA will set minimum technical and procedural requirements, while the individual states are expected to draw up and administer a detailed regulatory program. EPA originally proposed UIC rules in August 1976. The proposal aroused a storm of critical comments, many coming from the oil and gas industry. On April 20, 1979, EPA proposed a substantially revised set of technical requirements,² followed on June 14, 1979 by proposed procedural requirements for issuing UIC permits.³

Bear in mind that the UIC regulations described here, both technical and procedural, exist only as proposals at this time. Final regulations will probably come out in 1980, after which the states will have between nine and eighteen months to devise their own programs for EPA approval.

4.2 General Technical Requirements

UIC applies to all injection operations in areas where there are aquifers containing water that is or may be used

for drinking water. Any aquifer with less than 10,000 parts per million of total dissolved solids will be considered "drinking water" unless the state designates it, after public hearings, as not a drinking water supply for one of two reasons: 1) it is infeasible to use it for human consumption, or 2) it now produces minerals, oil, or geothermal energy.

The proposed regulations divide injection wells into four classes, with special standards for each class. All injection wells associated with oil and gas production or storage, including EOR operations, are designated Class II wells. Class II wells are subject to the following general requirements.

Construction:

1) They must inject into a stratum which has confining beds free of known open faults or fractures.

2) They shall be cased and cemented to prevent fluids from migrating into or between underground sources of drinking water. Specific casing and cementing requirements will depend on the well's depth, pressure, size, and casing, the type of fluid to be injected, and the nature of the rock in the injection zone.

3) Logs and tests will be required during construction. These will include directional surveys and various casing logs.

4) The injection formation must be described in terms of fluid pressure, temperature, fracture pressure, physical and chemical character of the rock and associated fluids, and the compatibility of the fluids to be injected.

Abandonment:

- 1) No migration of fluids into or between underground sources of drinking water is allowed.
- 2) The well must be in static equilibrium.
- 3) The owner or operator must post a bond to guarantee proper abandonment.

Operation:

- 1) The permit will limit injection pressure to assure that bottom hole pressure will not fracture the confining strata or cause fluid migration.
- 2) No injection will be allowed between the outermost casing protecting drinking water and the well bore.

Monitoring:

The operator must monitor and report on the nature of the injected fluids, and on the pressure, flow rate, and volume of fluids. In addition, he must demonstrate the mechanical integrity of the well at least once every five years.

Reporting:

The regulations require an annual report on the operation of the well and immediate reports of any permit violations, malfunctions, or other extraordinary conditions.

4.3 Permit Procedures: New Wells

Note: A new well is one into which injection begins after the UIC permit program for that state becomes effective (mid-1980 at the earliest). The procedures described here are in proposed form only. State procedures may vary somewhat from EPA's procedures; important matters left to state discretion will be noted.

4.3.1 Need for a Permit; Time to Apply.

No new injection well may begin to operate without a permit. Well construction without a permit is allowed (by EPA, but not under most state rules), but operators should be sure that the construction standards and records meet the requirements for approval of the well.

The UIC regulations do not set a specific deadline for permit application. Applications should be submitted "a reasonable time" before operations are expected to begin. Even for the most routine case, an applicant should allow at least 3 months for permit processing: 1 month for review of the application, 1 month for public notice of draft permit, and 1 month between a final permit decision and its effective date. Where advance planning allows, a better rule-of-thumb is to apply for a permit 6 months in advance. This is especially advisable where the UIC permit will be processed at the same time as other environmental permits under a consolidated permit procedure. The burden is on the operator to make a timely application; no operation may begin until a final and effective permit is obtained.

4.3.2 Permit Application

The application for a UIC permit for a Class II well (no form has yet been proposed by EPA) must be signed by one of the following people:

- A vice president or higher executive;
- a general partner, or
- the proprietor.

An authorized representative of one of the above persons may sign if the representative is responsible for the operation of the facility (e.g., superintendent), and if the authorization to sign the application is in writing and is submitted to the state director or EPA regional administrator. Moreover, the permit form will contain an elaborate statement for the applicant to sign certifying the accuracy and completeness of the information in the application.

The following information will be needed to complete a UIC permit application:

1. Name of the owner of operator, the location of the well, and the purpose of the well.
2. The area of review is one of the most controversial concepts in the proposed UIC regulations and should be monitored closely to assure compliance and avoid expensive delays in permit processing. As proposed, the regulation states that the "area of review" will be established by state or federal regulation, and will vary from one locality to another depending on the underground geology and hydrology, proximity to populated areas, ground water use and the toxicity of injected fluids. The area may be defined as a fixed radius of no less than 1/4 mile radius around the proposed injection well or a "zone of endangering influence" which may be computed by estimating the extent of lateral migration which the injected fluids may be expected to attain during the life of the facility.
3. For all wells within the area of review that penetrate the proposed injection zone, a table of data showing each well's type, location depth, and record of completion or plugging. Existing Class II (oil and gas producing or storage) wells may be excluded.

4. Operating data for the proposed injection well:
 - average and maximum daily rate and volume of injected fluids;
 - average and maximum injection pressure; and
 - the source of and the physical and chemical character of the injection fluid.
5. Geologic data on the injection zone and the confining strata.
6. Identity and dimensions of all underground sources of drinking water that might be affected.
7. Logging and testing program data on the well.
8. Engineering drawings of surface and subsurface construction details.
9. Formation testing program.
10. Stimulation program.
11. Injection procedure.
12. Contingency plans to prevent migration of injection fluid into underground drinking water.
13. Plans for performing required monitoring.
14. Plans for "corrective action" that may be necessary to plug or complete or otherwise correct existing wells in the area of review.
15. Certification of a bond or other guarantee of financial resources to close, plug, or abandon the well in the proper fashion.
16. A demonstration of the well's mechanical integrity.

4.3.3 Agency Permit Processing

The proposed EPA consolidated permit regulations describe a systematic approach to processing a permit, consisting of four major steps:

1. Review of Application: The agency has 30 days to review an application and request the applicant to correct any deficiencies or supply supporting information.

2. Preparation of Draft Permit: Once an application is complete, the agency will write a draft permit. At the same time, it will prepare a "Statement of Basis" explaining briefly the technical or legal reasons for the permit terms and conditions. For major facilities, a more elaborate "Fact Sheet" will also be prepared. A "Fact Sheet" describes the major issues involved in drafting the permit and explains the agency's decisions on those issues.

3. Public Participation: Public participation has two aspects: public notice, and public hearings. A public notice is required in every case. The public notice of a draft permit is given very wide circulation. A copy goes to the applicant, of course, to any concerned state or federal agency, to mailing lists of persons interested in such permits, and to various government journals and local newspapers for publication. At least 30 days after the notice appears must be allowed for comments. A public hearing is optional. Whether it is held depends on the level of interest in the permit or the importance of the facility. The agency will routinely schedule a public hearing at the time of public notice when public interest is anticipated. It will also schedule a hearing if there is a significant number of requests for a hearing in response to the public notice. The public hearing is to gather information and comments; no cross examination is involved. The hearing will be recorded verbatim and become part of the official record on the permit.

4. Permit Issuance: After the close of the public notice comment period and any hearings, the agency will prepare a final permit. Notice of the final permit will be sent to the applicant and other interested parties, including all public comments. The permit will not become effective until 30 days after the notice; during this period, interested persons, including the applicant, may petition

for review of any of the permit terms. If review is accepted, the parts of the permit to be reviewed are stayed -- do not become effective -- but parts of the permit that are not disputed go into effect.

4.3.4 Duration of Permit

UIC permits are good for the designed operating life of the facility, subject to the following conditions:

- If the facility holds other permits for fixed periods (for example, an NPDES permit) then the UIC permit will be reviewed and, if necessary, modified when the other permit is reissued. Otherwise, the permit must be reviewed by the agency every five years, and may be modified as appropriate.
- If the ownership of the facility changes, the permit may be transferred to the new owner only after executing a permit transfer agreement, notifying the permit program director, and receiving no objection from the director within 30 days.
- Like any other permit, a UIC permit is subject to modification or revocation at any time for reasons such as changes in regulations or the failure of the permit to contain all the legally required conditions.

Footnotes

Chapter 4

1. Safe Drinking Water Act, §1421, 42 U.S.C. §300h.
2. 44 Fed. Reg. 23738, proposed 40 C.F.R. Part 146.
3. 44 Fed. Reg. 34244, proposed 40 C.F.R. Parts 122-124.

5. HAZARDOUS WASTE MANAGEMENT

5.1 Introduction

The lack of detailed information on state regulations in this chapter marks hazardous waste management as an area of environmental regulation that is just emerging. Recent disclosures of public health dangers from abandoned hazardous waste dump sites ensure that this problem will receive immediate attention, but because the problem is both enormous and complex it will be several years before the regulatory programs are firmly established. EOR operators will need to learn the latest developments at both the federal and state levels before proceeding with construction and operation. This chapter outlines the federal law and identifies probable areas of future regulation.

5.2 The Resource Conservation and Recovery Act (RCRA)¹

Congress enacted RCRA in 1976 to address a number of problems with solid waste disposal. The outstanding issue, and the one of immediate concern to EOR operators, is the disposal of hazardous wastes. RCRA calls for "cradle-to-grave" management of hazardous wastes, and sets rigorous federal standards for the management program. In time, the states will administer most elements of this program, but the attention at this time focuses on the U.S. EPA, which is still trying to formulate the regulatory program. Final EPA regulations will not be promulgated until sometime in 1980,² after which it will take many more months to set up the administrative machinery to run the program.

5.2.1 Definition of the Hazardous Waste

RCRA defines the term "hazardous waste" as "a solid waste, or combination of solid wastes, which because of its

quantity, concentration, or 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."¹ Note that under RCRA "solid waste" includes liquid, semisolid, or contained gaseous material; this effectively covers, for example, liquid wastes permanently stored in lagoons.

EPA has proposed regulations establishing four basic criteria for identification of a hazardous waste:

- ignitability -- flash point less than 60°C, or compressed gas, or oxidizers
- corrosiveness -- aqueous solution with pH of 3 and below or 12 and above, or which corrodes steel at more than 1/4 inch per year at 130° F.
- reactivity -- strong reaction with air or water, etc.
- toxicity -- concentrations more than 10 times higher than primary drinking water standards (e.g., arsenic, cadmium, chromium, lead, mercury)

In addition, any wastes from specified industries are deemed hazardous. Oil production is not on this list, however.

In fact, EPA proposes to manage oil production brines and drilling muds (but not other wastes) as "special wastes" because of their large volume and low level of risk. Under this proposal, disposal of brines and muds would not have to meet the stringent safeguards applied to disposal of other hazardous wastes. The oil industry believes that this special waste proposal does not go far enough. At their urging, Congress is debating amendments to RCRA that would exclude brines and muds from RCRA regulation altogether, at least pending further scientific research on their hazardous

qualities. Whatever the outcome on this issue, chemical EOR facilities, which will handle and dispose of potentially "hazardous" injection materials, will almost certainly be affected by RCRA.

5.2.2 Hazardous Waste Management

For any material identified as hazardous, RCRA regulates generators, transporters, and disposal facilities. Generators will be required to report to EPA on the types and quantities of wastes they are generating. This could become a significant factor for chemical EOR operators who may be using large quantities of chemicals and recovering them after separating the chemicals and oil. Generators will also be responsible for preparing manifests to accompany wastes shipped and disposed of off-site. The manifest will describe the waste, its hazardous qualities, emergency procedures in case of exposure, and other information to ensure safe handling and proper disposal. The regulation of transport of hazardous wastes will impose extra paperwork on EOR operators who receive or ship out hazardous materials covered by the manifest system.

Some EOR operations may also be subject to the regulations on disposal facilities, depending on the quantity of waste they handle and the length of time they store it. EPA currently proposes that storage beyond 90 days be considered "disposal." The disposal facility regulations will establish elaborate siting and design requirements, operating standards, and bonding requirements to guarantee proper clean-up and closure of the facility. Without going into great detail (because the proposal regulations will be changed substantially) these design and operating standards emphasize protection of surface and groundwaters. Facilities may not locate in floodplains; they must have impervious liners and

dikes to prevent leaching or runoff: they must cover the wastes; and they must install wells to monitor leachate and to pump out any leachate that is detected.

The entire EPA program will be in place in late 1980, after which many states will develop state regulations to allow them to administer the federal program. Meanwhile, several states have already instituted their own hazardous waste management systems, and more can be expected to do so in the next year or two.

Footnotes

Chapter 5

1. 42 U.S.C. §§6901-6987.
2. EPA has proposed regulations on the following subjects:

Identification and testing of hazardous waste) 43 Fed. Reg.
Standards for Generators of hazardous waste) 58946
Standards for hazardous waste treatment,) Dec. 18, 1978.
storage, and disposal facilities)

Standards for transporters of hazardous
waste, April 28, 1978 43 Fed. Reg. 18506.

Guidelines for state hazardous waste pro-
grams February 1, 1978 43 Fed. Reg. 4366.

Notification system, July 11, 1978, 43
Fed. Reg. 29908.

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

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:

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

Except for the NPDES permit for "new sources" (See Chapter 3), and RCRA permits for hazardous waste facilities, EPA permits for construction or operation do not require EIS's. In

*Citations to these laws can be found in Appendix 2.

addition, cost-share projects in which DOE's financial participation is 50% or less do not require an individual EIS. Such projects are covered by a programmatic EIS.

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.

As you are probably aware, 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."*

The Coastal Zone Management Act (CZMA)

The CZMA was enacted to protect environmentally valuable shorelines, coastal wetlands and nearshore 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

*A programmatic EIS for Enhanced Oil Recovery is currently being prepared by the Department of Energy. When finalized, this document will provide valuable assistance to anyone preparing a "negative declaration."

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:

- Identification of the landward boundary of the coastal zone.
- Declaration of permissible land and water uses.
- Inventory of areas of particular concern.
- Administrative program to control land and water uses.
- Guidelines for priorities of uses in particular areas.
- 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.

So far, all the coastal states have at least initiated planning and many have adopted comprehensive plans. 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. Of the states covered in this handbook, so far only California has an approved program.

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 may 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 co-ordination 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 to find out whether any endangered species exist in the area, and if so what special measures may be necessary to protect them.

The Toxic Substances Control Act (TSCA)

Congress passed TSCA in 1976, but it has still not emerged as a significant factor. However, 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.

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.

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.¹ 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. The application requirements and operational standards (casings, etc.) are similar to those under the state programs described in chapter 4.

NTL-3A (44 Fed. Reg. 2204), a final version of NTL-3, concerns reports of spills and other accidents. "Major" events, including spills of 100 barrels or more of oil, saltwater, or toxic liquids, or spills of any size in "sensitive" areas (lakes, streams, wildlife sanctuaries), must be reported to the USGS by phone within 24 hours. A written report must also be filed within 15 days describing the incident, the resulting damage, and containment and clean-up efforts. For spills of 10-100 barrels, no immediate notice is required (unless required under other law; see chapter 3), but a written report must be filed. Spills of less than 10 barrels need only be reported in the lessee's monthly report of operations.

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)
(no production allowed in wilderness areas)

Bureau of Reclamation

- Controls on use of reservoir areas and injection systems

Fish and Wildlife Service

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

Footnotes

Chapter 6

1. Federal control over leases for environmental protection purposes was unsuccessfully challenged after the catastrophic Santa Barbara blow out of 1969. The Secretary of the Interior suspended the drilling permits previously granted to leaseholders in the Santa Barbara Channel after the blow out, citing the need to protect marine resources while revisions to federal law were considered by Congress. In the case of Gulf Oil Corp. v. Morton in the federal court of appeals in California (493 F. 2d 141, [9th Cir. 1973, 1974]) the courts upheld the suspension order (although a second suspension order was disapproved). Any doubts about environmental control authority for OCS operation were removed by the 1978 amendments to the Outer Continental Shelf Lands Act (43 U.S.C. §§1331-1356), which expressly authorizes suspension or cancellation of leases to protect the environment.

7. STATE REGULATIONS

7.1 ALABAMA

AIR POLLUTION

Agency in charge: Air Pollution Control Commission
State Office Building
Montgomery, Alabama 36104

Key laws or regulations: Alabama Air Pollution Control Act
No. 769, Laws of 1971, and Alabama
Air Pollution Control Rules and Regu-
lations.

Emission limits: Particulates

o Visible emissions -
3 mins/hr. not greater than
60% opacity

o Fuel burning equipment

<u>Input</u> <u>(millions Btu/hr)</u>	<u>Allowable Emissions (lb/millionBtu)</u>	
	<u>Class I County</u>	<u>Class II County</u>
1	.5	.8
10	.5	.8
20	.37	.53
40	.27	.35
60	.23	.28
80	.20	.24
100	.18	.21
150	.15	.16
200	.13	.14
250	.12	.12
1,000,000	.12	.12

SO₂:

Class I County - 1.8 lb/MMBtu
Class II County - 4.0 lb/MMBtu

NOx (sources of 250 MMBtu/hr or greater):

- gas: 0.20 lb/MMBtu
- oil: 0.30 lb/MMBtu
- coal: 0.70 lb/MMBtu

Alabama (cont.)

HC:

No gas stream of more than 40 pounds per day, nor more than 8 pounds in any one hour.

- o Crude oil storage (over 60,000 gallons)
 - does not apply to crude petroleum produced, separated, treated or stored in the field
 - limit of 11 psia vapor pressure

Permits required:

Permit to construct (new or alteration) of any new or increased source of air contaminants. Apply 60 days before startup.

Permit to operate required after construction is completed. Inspection by Commission to assure compliance with construction permit.

Must show ability to reduce air emissions during periods of Air Pollution Alerts or Emergencies.

Enforcement:

Injunction; fines up to \$1,000 per day of violation. Wilful acts can result in imprisonment.

WATER POLLUTION

Agency in charge:

Water Improvement Commission
State Office Building
Montgomery, Alabama 36104

Key laws or regulations:

Alabama Water Pollution Control Act, Act No. 1260, Laws of 1971; Water Improvement Commission Regulations; Rules and Regulations of Alabama State Oil and Gas Supervisor.

Permits required:

State-issued NPDES permit. Approval of State Oil and Gas Supervisor for well drilling, completion, re-entry, or underground disposal or injection of salt water and other waste fluids from oil and gas operations.

Alabama (cont.)

- Spills:** Must be reported immediately to the Oil and Gas Supervisor with details and locations of incident. Full report must follow in 15 days, with copy to Water Improvement Commission. Oil and Gas regulations require usual pits, basins, dikes, etc. to prevent surface spills.
- Enforcement:** The Alabama Law provides for injunctions, civil fines up to \$10,000 per violation, and recovery of damages including cleanup costs and punitive damages where warranted. Also, violations arising out of wilful acts or gross negligence can result in criminal fines up to \$25,000 per day of violation and/or imprisonment for up to one year.

UNDERGROUND INJECTION

- Agency in charge:** State Oil and Gas Board
P. O. Drawer O
University, Alabama 35486
(205) 349-2852
- Key laws or regulations:** Oil and Gas Board rules and regulations, Rule E-4; also Section 917-80 et. seq. of Oil and Gas Laws of Alabama.
- Permit required:** Underground injection or disposal permit
- Discussion:** Oil and Gas Board has regulatory control over all injection and re-pressuring or stimulation projects. The project plan must be approved by the Board following proper application.
- Disposal of any wastes other than produced salt water must also be approved by the Alabama Water Improvement Commission.

Alabama (cont.)

HAZARDOUS WASTE DISPOSAL

Agency in charge:	Alabama State Department of Health Division of Solid Waste and Vector Control State Office Building Montgomery, Alabama 36104
Key laws or regulations:	Alabama Solid Wastes Disposal Act, (Act No. 771, Laws of 1969, as amended in 1971); State Board of Health Solid Waste Management Regulations.
Permit required:	For disposal sites and storage - collection - transportation facilities
Coverage:	Solid wastes only.

7.2 CALIFORNIA

AIR POLLUTION

- Agency in charge: California Air Resources Board
P.O. Box 2815
1102 Q Street
Sacramento, California 95812
- Key laws or regulations: California Health and Safety Code
Division 26,
Part 4, Chapter 4.
- Permit required: Construction permit.
- Discussion: Air pollution of all types is a problem in most of California. The ozone problem is well known; many areas are also designated as not attaining national ambient air quality standards for sulfur dioxide and nitrogen dioxide. Thermal EOR operations emit major amounts of all these pollutants.
- Nonattainment status signifies very strict control of air emissions from both existing and new sources. Emission limitations for each source will be set on a case-by-case basis. New sources in nonattainment areas must satisfy three conditions to obtain permission to construct:
- 1) demonstrate that all other sources in the state owned by the same company are complying with air pollution regulations;
 - 2) the emissions from the new source will be offset by emission reductions at nearby existing sources; and
 - 3) the new source will meet the lowest achievable emission rate.

The Kern County situation vividly shows the problems that EOR will face in California. In December, 1978, an air stagnation episode caused a short term build-up of sulfur dioxide above the 24-hour ambient air quality standard. Even though one reading in a year

California (cont.)

over the standard is not considered a violation, the Kern County Air Pollution Control District moved quickly to impose sulfur dioxide control requirements on thermal EOR operations in the area of the highest concentrations. The company running the operation elected to shut down 62 steam generators rather than install costly pollution control equipment. No further violations of the SO₂ standard have been recorded, but the generators are still not operating.

A projection of thermal EOR operations in Kern County through 1990 shows that 90% control of SO₂ emissions and 40% control of NO₂ emissions from new steam generators will be necessary to accommodate the larger number of generators without exceeding air quality standards. Moreover, existing operations will need to retrofit SO₂ controls to reduce emissions between 27% and 55% to meet federal and state standards, respectively. Intermittent control systems are technically feasible, but may be administratively or legally unacceptable.

Permit application

procedure:

Three characteristics distinguish the California air pollution control program from air programs in other states:

- Local control: The California air laws delegate standard setting and program administration to county or basin-wide districts, such as the Kern County Air Pollution Control District. The state law sets general requirements, and the state Air Resources Board oversees the local programs, but most authority is retained in the districts, and pollution control requirements and permit procedures vary from district to district.

Table 7-1. CALIFORNIA AMBIENT AIR QUALITY STANDARDS
(Applicable Statewide)*

Substance	Concentration and Methods*	Duration of Averaging Periods	Most Relevant Effects	Comments
Oxidant (as ozone)	0.10 ppm ultraviolet photometry	1 hour	Aggravation of respiratory diseases	This level is below that associated with aggravation of respiratory diseases.
Carbon Monoxide	10 ppm NDIR	12 hours	2-2½% COHb	This level is below those associated with impairment in time discrimination, visual function, and psychomotor performance. At altitude the lowered oxygen tension leads to greater absorption of CO. Persons participating in strenuous recreational activities at higher altitudes are often unacclimated.
	40 ppm NDIR	1 hour	2-2½% COHb	
Carbon Monoxide (Applicable only in the Lake Tahoe Air Basin)	6 ppm NDIR	8 hours	Will increase COHb by 1-1½%	
Sulfur Dioxide	0.5 ppm conductimetric method 0.05 ppm conductimetric method, with oxidant (ozone) in excess of state standard, or with suspended particulate matter in excess of state 24-hour suspended particulate matter standard.	1 hour 24 hours	a. Approximate odor threshold. b. Possible alteration in lung function. a. Will help prevent respiratory disease in children. b. Higher concentrations associated with excess mortality.	Alteration in lung function was found at this level in only one study. Other studies reported higher concentrations to cause this effect. a. Further studies on co-carcinogenic role are necessary. b. Does not include effects on vegetation, ecosystem and materials. c. May not include a margin of safety.
Visibility Reducing Particles	In sufficient amount to reduce visibility** to less than 10 miles when relative humidity is less than 70%	1 observation	Visibility impairment on days when relative humidity is less than 70%.	
Visibility Reducing Particles (Applicable only in Lake Tahoe Air Basin)	In sufficient amount to reduce the prevailing visibility** to less than 30 miles when relative humidity is less than 70%	1 observation	Reduction in scenic quality on days when the relative humidity is less than 70%.	
Suspended Particulate Matter	60 µg/m³ high volume sampling 100 µg/m³ high volume	24 hour samples, annual geometric mean 24 hour sample	Long continued exposure may be associated with increase in chronic respiratory disease. Exposure with SO₂ may produce acute illness.	This standard applies to suspended particulate matter in general. It is not intended to be a standard for toxic particles such as asbestos, lead, or beryllium. Because size distribution influences the effect of particulate matter on health, the standard will be reevaluated as data on health effects related to size distribution become available.

(Table 7-1 continued on next page)

Table 7-1. (Continued)

Substance	Concentration and Methods*	Duration of Averaging Periods	Most Relevant Effects	Comments
Lead (particulate)	1.5 $\mu\text{g}/\text{m}^3$ AIHL, Method No. 54, or equivalent	30 day average	Increased body burden, impairment of blood formation and nerve conduction.	
Hydrogen Sulfide	0.03 ppm, cadmium hydroxide STRactan Method	1 hour	Exceeds the odor threshold.	
Nitrogen Dioxide	0.25 ppm, Saltzman	1 hour	a. At slightly higher dosage, effects are observed in experimental animals, which imply a risk to the public health. b. Produces atmospheric discoloration.	
Sulfates	25 $\mu\text{g}/\text{m}^3$ total sulfates AIHL #61	24 hours	a. Decrease in ventilatory function b. Aggravation of asthmatic symptoms c. Aggravation of cardiopulmonary disease d. Vegetation damage e. Degradation of visibility f. Property damage	This standard is based on a Critical Harm Level, not a threshold value.

*Any equivalent procedure which can be shown to the satisfaction of the Air Resources Board to give equivalent results at or near the level of the air quality standard may be used.

**Prevailing visibility is defined as the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.

*Ambient air quality standards are reviewed annually. Standards may be revised or new standards added.

California (cont.)

- Frequent changes in rules: Because the air pollution problem is so serious and complex and the number of sources so large, the districts are perpetually readjusting their programs to make them more effective. All districts are currently revising their management plans and resubmitting them to the state Air Resources Board (and then to the EPA) for approval.
- Strict controls and strict enforcement: State and local officials take their air pollution control responsibilities seriously, and have the staff and budgets to do a thorough job. The swift response to the Kern County SO₂ problem in 1978 is an example² of this attitude.

In light of these characteristics, the discussion that follows of certain local rules should be used only as a reference point. Prospective EOR operators in California should call the local air pollution control district as early as possible in the planning process to ascertain the latest requirements and procedures. Generally speaking, operators should assume that a year of pre-application ambient air quality monitoring will be required unless monitoring data from the immediate vicinity is already available.

Kern County and South Coast District Rules: Newly adopted rules in these two key districts impose very strict controls on new sources of any pollutant covered by a national ambient standard, including SO₂, NO₂, HC, and particulates. The general rule for new sources is that they must offset their emissions on a ratio of 1.2 to 1. They must also apply BACT -or LAER- level control

California (cont.)

technology, and maintain their emission rates at very low levels. For example, SO₂ emissions cannot exceed the equivalent of 0.25% sulfur fuel by weight; a source burning 2.5% sulfur fuel must therefore use 90% efficient SO₂ removal technology. Finally, they must also evaluate in their permit applications the effect of the source on traffic, electric power demand, and similar factors. The only exemption from these rules is for sources causing an increase in emissions of less than 150 lbs/day.

Enforcement:

If a violation of a regulation or permit requirement occurs, the air pollution control district may issue an order of abatement to enjoin further violation. Failure to comply with an order of abatement is punishable by a civil penalty of up to \$6,000 per day of violation. Enforcement in California is extremely rigorous, as the shut down of the Kern County EOR operations shows.

WATER POLLUTION

Agency in charge: State Water Resources Control Board
P.O. Box 100
Sacramento, California 95801

Key laws or regulations: California Administrative Code,
Title 23, Chapter, 3 Subchapter 9.

Permit required: State-issued NPDES permit.

Permit application
procedure: California administers the NPDES system under regulations very similar to those of the U.S. EPA (see section 3.3). No special requirements or exemptions are provided for oil and gas production activities. In fact, the state law specifically covers disposal into wells, even though that is excluded by the federal law.

California (cont.)

NPDES applications are reviewed and acted on by regional water quality control boards. (There are 9 regional boards with basin-wide jurisdiction; e.g. Central Valley, Central Coast, Los Angeles.) The applicant has an automatic right of appeal to the State board from the regional board's decision. The application fee ranges from \$100 to \$1000 depending on the volume of the discharge.

Spills:

Subchapter 10 of the California Water Regulations encourages use of mechanical spill clean-up measures. Use of chemicals for clean-up is strictly regulated. First, the state must approve the chemical as an "oil spill clean-up agent" (OSCA). OSCA's must meet various specifications, such as flash point greater than 170° F, low heavy metal content, and at least six hour maintenance of 15% emulsion with No. 6 fuel oil. Second, OSCAs must be used under the supervision of the Department of Fish and Game (except in "disaster" situations). Generally, their use will not be allowed in sensitive areas (waterfowl habitat, recreational beaches, etc.) unless mechanical cleanup is determined to be ineffective.

Enforcement:

The Board may issue cease and desist orders against violators of the law or regulations. The attorney general may sue in court for an injunction against any violation. Discharges in violation of the law are considered misdemeanors.

UNDERGROUND INJECTION

Agency in charge:

California Water Resources Control Board
P.O. Box 100
Sacramento, California 95801

California (cont.)

Key laws or regulations: Water Quality Control Act, section 13540; Water Code, Title 23

Permit required: For waste disposal.

Discussion: The California Water Quality Control Act prohibits disposal wells that reach to or into a usable water stratum. Other disposal wells require a permit. To obtain a permit, the following three conditions, at least must be met:

(1) There is no hydraulic continuity between the injection stratum and usable water;

(2) The construction of the well and the injection pressure will prevent migration of the waste into usable water; and

(3) The Division of Oil and Gas of the Department of Conservation certifies that the construction and operation of the well meets the Division's requirements.

The Division of Oil and Gas regulations address such "down-hole" matters as well logs, casing and cementing, and "shut-off" procedures in case migration or other pollution does occur.

By cross reference to other rules, the water regulations provide that the procedure for reviewing an application for a disposal well will be the same as for a surface discharge. The regional water quality control board will conduct the initial review and make the initial determination of permit terms and conditions.

HAZARDOUS WASTE

Agency in charge: Hazardous Materials Management Section
Department of Health Services
714/744 P Street
Sacramento, California

California (cont.)

Key laws or regulations: Hazardous Waste Control Law,
Health and Safety Code, Div. 20,
Chap. 6.5
Hazardous Waste Control Regulations

Permit required: Hazardous Waste Facility Permit

Discussion: California's water quality regulations classify various oil production wastes as "Class I" wastes, which may be disposed of only in the highest-grade disposal sites. Oil production brines, drilling muds containing toxic materials, and other toxic or hazardous fluids are all classified as Class I wastes. This may restrict both on-site and off-site waste disposal options for EOR operators.

California also has a comprehensive Hazardous Waste Control Act, administered by the Department of Health. Regulations under the act list 791 hazardous substances. They classify oil and wastes containing oil as hazardous; drilling muds, tank bottom sediments, and waste chemicals are classified as "extremely hazardous."

The California law and regulations are similar to the federal scheme under RCRA. Waste producers must complete a manifest describing the type and quantity of waste to be shipped off-site. Hazardous waste transporters are licensed by the state. Both on-site and off-site disposal facilities must obtain permits to operate. In addition, both on-site and off-site disposal is charged a fee of one dollar per ton, up to a maximum of \$25,000 per month.

To obtain a permit, the facility operator must submit engineering data and an operation plan to the Department of Health at least 60 days before starting to receive waste. The plan must describe:

California (cont.)

- types and quantities of waste
- equipment
- general procedures to protect public health and safety
- procedures for receipt and identification of waste
- supervisory personnel
- closure plan
- map showing contours, fencing, monitoring wells, leachate control systems, etc.
- contingency plans for accidents and emergencies.

Facilities intending to handle "extremely hazardous" waste will need an Extremely Hazardous Waste Disposal Permit. Application should be made at least 15 days in advance, and should specify handling procedures for such waste.

On-site storage of hazardous waste for up to one year does not require a disposal permit. However, the storage area must be secured against unauthorized entry, and warning signs in English and Spanish must be posted.

7.3 COLORADO

AIR POLLUTION

Agency in charge:

Air Pollution Control Division
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220

Key laws or regulations:

Colorado Revised Statutes, Title
25, Art. 7: Colorado Air Pollu-
tion Control Regulation 3.

Note: Colorado recently enacted
a new air law; this section re-
flects the new law, but the state
regulations may be subject to
change.

Emission Limits:

Particulates:

- Visible emissions: No more
than 20% opacity.
- Existing fuel burning equip-
ment:
 - Under
 - 1 MMBtu/hr: 0.5 lbs/MMBtu
 - 10 MMBtu/hr: 0.27 lbs/MMBtu
 - 100 MMBtu/hr: 0.15 lbs/MMBtu
 - More than
 - 500 MMBtu/hr: 0.10 lbs/MMBtu
- New fossil-fuel fired steam
generators more than 250 MMBtu/
hr: 0.10 lbs/MMBtu
- Various controls on fugitive
dust:
 - Examples: watering or speed
control on unpaved roads,
revegetation.

SO₂:

- New oil-fired fuel burning
equipment:
 - Less than 250 MMBtu/hr: 0.8
lbs/MMBtu

Colorado (cont.)

SO₂: (continued)

- 250 MMBtu/hr. or greater:
0.3 lbs/MMBtu
- New coal-fired fuel burning equipment:
 - Less than 250 MMBtu/hr:
1.2 lbs/MMBtu
 - 250 MMBtu or greater: 0.4
lbs/MMBtu

NO_x:

- New fossil-fuel fired steam generators of more than 250 MMBtu/hr:
 - Gas: 0.20 lb/MMBtu
 - Oil: 0.30 lb/MMBtu
 - Coal: 0.70 lb/MMBtu

HC:

- Oil-water separators handling more than 200 gallons of oil/day with vapor pressure of 0.5 lbs. or greater:
 - Sealed cover, or
 - Floating cover, or
 - Vapor recovery.

Permit required:

Construction permit (exceptions noted below)

The owner or operator of a source of air pollution must file an air pollutant emission notice with the Division before constructing or operating the source. (Sources of "minor significance" may be exempt.) Moreover, owners or operators of new or modified sources must obtain a permit to construct and to commence operation.

Colorado (cont.)

Exemptions:

Regulations under the prior law exempted some types of sources used in EOR operations from the permit requirement: internal combustion engines of less than 1,000 horsepower, gas-fired fuel burning facilities of less than 500,000 Btu/ hr. heat input, and sweet gas fired heater treaters.

Permit application

procedure:

The application for a permit to construct calls for equipment information, plans, descriptions, and specifications. The Division may also require ambient air quality monitoring and modeling, which will generally apply only to major sources or sources in areas of marginally acceptable air quality. The applicant pays a filing fee of \$40.00 for an air pollutant emission notice, plus the administrative costs of the permit review, up to a maximum of \$25,000. The Division has 20 days to review the application for completeness.

Once the application is complete, the Division issues a preliminary analysis within 60 days. If the source will emit more than 25 tons per year, the preliminary analysis must be given public notice. Public hearings will be held on request, which may prolong the process by several months.

The source must also notify the Division at least 30 days before actual commencement of operation.

Enforcement:

The first response to an alleged violation is a Notice of Violation to the source. If the problem is not corrected within 30 days, the Division may issue a compliance order. Violations of the order may be punished by a court injunction or by a penalty of up to \$25,000 per day.

Colorado (cont.)

WATER POLLUTION

Agency in charge: Colorado Department of Health
Water Quality Control Commission
4210 East 11th Avenue
Denver, Colorado 80220

Key laws or regulations: Colorado Regulations for the State
Discharge Permit System.

Permit required: State-issued NPDES Permit.

Permit application
 procedure: The Colorado regulations governing
the terms, conditions, and pro-
cedures for obtaining a water dis-
charge permit closely follow the
U.S. EPA rules outlined in
section 3.3. There are no special
provisions relating to oil and
gas production facilities.

Spills: The spiller must notify the Division
of Administration, Colorado Depart-
ment of Health, as soon as the spill
is discovered. The state may direct
clean up operations. Failure to noti-
fy is a crime punishable by fine and/
or imprisonment.

Enforcement: The first enforcement measure is a
notice of violation stating the
nature of the alleged violation,
the facts of the violation, and
recommended corrective actions.
The state may at the same time
issue a cease and desist order,
which must also specify a deadline
for compliance. The source may be
required to, or may request in
writing the opportunity to, appear
at a hearing to respond to each
alleged violation through evidence
and cross-examination. Violations
of cease and desist orders may be
prosecuted in county court by the
district attorney, who may seek
injunctions and civil penalties
up to \$10,000 per day.

Colorado (cont.)

UNDERGROUND INJECTION

Agency in charge: Colorado Department of Health
Water Quality Control Commission
4210 East 11th Avenue
Denver, Colorado 80220

Key laws or regulations: Colorado Water Quality Control Act,
Colo. Rev. Stat., section 25-8-505

Permit required: Underground disposal permit

Permit application
procedure: The Colorado Water Quality Control
Act does not exempt or make special
provision for either produced water
disposal or production-related fluid
injection. It appears, therefore,
that these may be considered pol-
lution of state waters, and would
therefore be subject to permitting
under the same standard as surface
discharges.

Disposal underground of hazardous
wastes is covered by a separate
permit requirement. Under this
provision, the Commission must find
that there will be no pollution of
water from the disposal, or that the
pollution will be confined to a
"limited area" from which no migra-
tion is likely. The application fee
for such a permit is \$1,000. The
permit may contain monitoring and
reporting requirements and a per-
formance bond guaranteeing com-
pliance with the permit.

HAZARDOUS WASTE

Agency in charge: Colorado Department of Health
Radiation and Hazardous Waste Div.
4210 East 11th Avenue
Denver, Colorado 80220

Key laws or regulations: In preparation.

Permit required: For permanent disposal facility.

Colorado (cont.)

Discussion:

The existing Colorado regulations on solid waste disposal facilities do not specifically deal with hazardous waste or with temporary on-site storage of wastes. The only regulations now in effect set standards for the licensing of permanent solid waste disposal facilities. New regulations are being prepared but have not yet been published.

Under the existing regulations, each disposal facility must receive a Certificate of Designation from the Board of County Commissioners. To obtain such a certificate, the facility must submit an Engineering Design Report demonstrating design compliance with the following criteria:

- prevention of surface water flow into or through the area, including flood waters
- prevention of groundwater contamination; including protection of water quality in nearby wells
- effective compaction and covers
- security and fire prevention measures
- closure plan.

7.4 ILLINOIS

AIR POLLUTION

Agency in charge: Illinois Environmental Protection Agency
Division of Air Pollution Control
2200 Churchill Road
Springfield, Illinois 62706

Key laws or regulations: Air Pollution Control Regulations
Rule 103

Emission limits:

Particulates:

- Visible emissions -
3 mins./hr. not greater than 40% opacity; otherwise not greater than 20%
- Fuel combustion sources (outside Chicago):
 - Coal: Less than 10 MMBtu/hr:
1.0 lb/MMBtu
 - Greater than 250 MMBtu/hr: 0.1 lb/MMBtu
 - New sources: 0.1 lb/MMBtu
 - Oil:
0.1 lb/MMBtu

SO₂ (except Chicago, Peoria, East St. Louis):

- Greater than 250 MMBtu/hr:
Coal - 1.2 lb/MMBtu
Residual Oil - 0.8 lb/MMBtu
- 250 MMBtu/hr. or less:
Coal - 1.8 lb/MMBtu
Residual Oil - 1.0 lb/MMBtu

NO_x (sources of 250 MMBtu/hr. or greater):

- Oil: 0.30 lb/MMBtu
- Coal: 0.7 lb/MMBtu
- Crude oil storage (over 40,000 gallons)

Illinois (cont.)

- Existing cone roof tank for Illinois crude under following conditions:

- 1) less than 5 psia vapor pressure
- 2) outside metropolitan area
- 3) equipped with positive pressure tank vent valves and vacuum breakers.

- Floating roof with seals or vapor recovery and disposal system capable of collecting 85% of volatile organic material.

Permits required:

New source construction and operation.

Exemptions:

- internal combustion engines of less than 1500 horsepower
- oil field tanks for storage of Illinois crude oil of less than 40,000 gallons capacity
- oil-water separators for Illinois crude of less than 5 p.s.i.a.

Illinois has adopted or will be adopting new source review procedures for major sources that parallel EPA's requirements. For sources that do not qualify as "major" (see section 2.2.2), Illinois Rule 103 applies.

Permit application
procedure:

The application for a construction permit must describe:

- the nature of the source and its air pollution control equipment
- the nature, source, and quantity of controlled and uncontrolled emissions

Illinois (cont.)

- the type, size, and efficiency of air pollution control equipment, including specifications and engineering drawings certified by a registered professional engineer.

Start-up and testing will be authorized by the construction permit.

After start-up, the source must obtain an operating permit by demonstrating compliance:

- compliance with emission limitations
- construction in accordance with construction permit
- minimization of start-ups and start-up emissions
- any necessary compliance schedules and emergency episode procedures.

The operating permit is good for five years; renewals must be applied for at least 90 days in advance.

Standardized equipment may be permitted under a Joint Construction and Operating Permit

Enforcement:

The maximum penalty in Illinois for violation of the law or regulations is \$10,000 plus \$1,000 per day for each violation. The state may also sue to enjoin violations.

WATER POLLUTION

Agency in charge:

Department of Mines & Minerals
Division of Oil and Gas
Room 704
Stratton Office Building
Springfield, Illinois 62706

Illinois (cont.)

Key laws or regulations: Rules and regulations of the Department of Mines and Minerals for the Oil and Gas Division, Rule IX.

Permit required: No surface discharge allowed.
Permit required for earthen pits.

Discussion: Illinois law and the regulations of the Oil and Gas division absolutely prohibit surface discharges of salt water or "other waste liquids." Rule IX allows only two methods of liquid waste disposal: underground injection or disposal in earthen pits lined with impervious material and diked to prevent surface drainage into the pit. A permit is required for earthen pit construction; application should be made to the Oil and Gas Division, which will rule on the application within 10 days.

Spills: State regulations call for "all reasonable measures," such as catchment basins and dikes, to prevent spills into state waters.

Enforcement: For violations requiring corrective action by the operator, the division issues orders and, if necessary, holds hearings on those orders. For violations or conditions presenting imminent danger, the division refers the matter to the local state's attorney to obtain a court cease and desist order and/or a fine. Illinois's general public nuisance law authorizes criminal charges if the violation threatens the public health.

UNDERGROUND INJECTION

Agency in charge: Department of Mines and Minerals
Division of Oil and Gas
Room 704
Stratton Office Building
Springfield, Illinois 62706

Illinois (cont.)

Key laws or regulations: Rules and Regulations of the Department of Mines and Minerals for the Oil and Gas Division Rule II (4).

Permit required: Permit for input well.

Permit application procedure: In Illinois, one permit covers both disposal of produced water or waste chemicals and injection of materials for EOR purposes. The applicant must:

- identify all producing, drilling, or abandoned wells and all mines or mined out areas within one-half mile of the proposed injection well
- identify the substance to be injected, the depth of injection, and the injection formation
- provide information on the well casing and cementing, and a drilling log.

The applicant must also comply with certain procedures. The application must be signed by the owner or someone authorized by the owner in writing. A permit fee of \$40.00 must accompany the application. Finally, the applicant must send notice of the application to the owners of all the mines and wells within the half-mile radius.

Once a complete application has been filed, it will be held for ten days to receive any objections from nearby owners or others. If objections are received, the Mining Board may decide to hold a hearing. The Board may deny a permit if there is a danger of pollution or when the protective measures may not be enough to confine the injected material to the intended stratum.

Illinois (cont.)

HAZARDOUS WASTE

Agency in charge: Department of Mines and Minerals
Division of Oil and Gas
Room 704
Stratton Office Building
Springfield, Illinois 62706

Note: As described in the section on water pollution control (see Section 3.4), Illinois has certain regulations on earthen pits and other surface waste storage facilities. There are no specific regulations on the storage or ultimate disposal of solid or hazardous waste materials. The Division expects that all waste materials will be reinjected or disposed of off-site.

7.5 KANSAS

AIR QUALITY

Agency in charge: Air Quality Conservation Commission
Kansas Department of Health and
Environment
State Office Building
Topeka, Kansas 66612

Key laws or regulations: Kansas Air Pollution Emission
Control Regulations, Section 28-
19-8.

Emission limits:

Particulates:

Visible emissions: 20% opacity

Fuel-burning equipment

- Under 10MMBtu/hr.: 0.6 lbs/MMBtu
- Over 10,000 MMBtu/hr.: 0.12 lb/
MMBtu

SO₂:

Fuel-burning equipment larger than
250 MMBtu/hr.: 1.5 lb/MMBtu

NO_x:

Fuel-burning equipment larger than
250 MMBtu/hr.:

- gas or oil: 0.30 lb/MMBtu
- coal: 0.90/lb/MMBtu

HC:

No gas stream of more than 50 lbs/
day unless burned by smokeless
flares.

Permits required:

Approval to construct or alter the
following types of sources:

- process equipment, machines,
etc. (e.g., internal combustion
engines) emitting more than 1 lb./
hr. of particulates or 2 lbs./hr.
of sulfur oxides or 50 pounds or
more of non-methane hydrocarbons
in a 24-hour period.

Kansas (cont.)

- fuel burning equipment with more than 100 MMBtu/hr. heat input burning gas, or more than 1 MMBtu/hr. heat input burning distillate oil, or more than 350,000 Btu/hr. heat input burning residual oil (No. 5 or heavier) or coal.

Permit application

procedure:

Kansas requires persons expecting to construct or alter an air pollution source to notify the Department of Health and the Environment at least 60 days before construction.

The notice to the Department must specify:

- the location of the source
- the fuels and materials to be used by the source
- the nature and rate of the emissions.

The Department will rule on an application within 60 days.

Note that Kansas is one of three jurisdictions that has yet to submit a revised SIP to EPA. Therefore, major sources will require construction permits from the EPA regional office (Region VII, Kansas City).

Enforcement:

The first level of enforcement is an order to cease and desist from the alleged violation. If violations continue after such an order has been issued, they are punishable by a penalty of up to \$10,000 per day.

Kansas (cont.)

WATER POLLUTION

Agency in charge: Division of Environment
Kansas Department of Health and Environment
Forbes Field
Topeka, Kasas 66620

Phone: (913) 862-9360

Key laws or regulations: K.S.A. 55-1003
K.S.A. 28-16-57

Permit required: State-issued NPDES permit;
Permit for surface ponds.

Permit application
 procedure: In Kansas, jurisdiction over water discharges from EOR operations is shared between the Department of Health and Environment and the State Corporation Commission. The Department of Health and Environment is responsible for determining that a proposed disposal method is "feasible" to protect water resources from "preventable pollution." The State Corporation Commission must review disposal practices to ensure that they will not result in the loss of waste or oil and gas resources.

The general standard for production operations is to prevent any salt water or refuse from escaping the lease site by confining it in tanks, pipelines, or ponds. However, there is no statutory prohibition against a regulated discharge. Any permit for such a discharge would be processed under the Kansas rules for the NPDES program, which are very similar to the EPA rules described in section 3.3.

The Department of Health and Environment must also approve any surface ponds at EOR operations. The operator must apply to the Department,

Kansas (cont.)

which has 10 days to rule on the application. Unless the Department denies the permit within 10 days, it will be considered granted.

Spills:

Any accidental or emergency spill of pollutants which may enter the waters of the state must be reported immediately to the Department of Health and Environment.

Enforcement:

The Department of Health and Environment may issue orders to stop oil production operations whenever it determines that the waters of the state are not being protected from pollution or that any storage or disposal of wastes is likely to cause pollution. Such orders become effective in 10 days unless the operator requests a hearing.

In addition, the Department may issue notices of violation and orders for correction of violations of the water pollution laws or regulations, or the terms of a permit. The Department is also authorized to impose civil penalties of up to \$10,000 per day of violation; the penalty should "constitute an actual and substantial economic deterrent to the violation." Orders and penalties may be appealed through an administrative hearing and, ultimately, up to the district court.

If necessary, the Department may request the attorney general to sue for penalties or damages.

UNDERGROUND INJECTION

Agency in charge:

State Corporation Commission
State Office Building
Topeka, Kansas

Kansas (cont.)

Key laws or regulations: K.S.A. 55-133, 1003, 1004

Permit required: For salt water disposal and injection for production.

Permit application procedure: The State Corporation Commission exercises jurisdiction over some aspects of underground injection; other aspects are regulated by the Department of Health and Environment. In particular, the Department of Health and Environment has the authority to determine that the most feasible method of waste disposal is by a disposal well. Once such a determination is made, the Corporation Commission must require underground disposal unless evidence showing it is not feasible is presented at a hearing contesting the determination of the Department of Health and Environment. The Department, rather than the Corporation Commission, also specifies the maximum injection pressures that may be allowed.

For injection for EOR production purposes, the operator must apply only to the Corporation Commission for approval. The Corporation Commission will establish the drilling procedures, pressures, and other permit conditions to protect "usable" water resources. At this time, Kansas defines "usable" water as water containing less than 5,000 parts per million of chlorides. Of course, proper well casing is required for any production or disposal well to prevent contamination of groundwater.

HAZARDOUS WASTE

Agency in charge: Kansas Department of Health and Environment
Division of Environment
Forbes Field
Topeka, Kansas 66620

Kansas (cont.)

Key laws or regulations: Solid Waste Management Act, K.S.A. 1979 Supp. Chap. 65, Art. 34; Solid Waste Management Standards and Regulations, Part 3.

Permit required: Hazardous waste disposal area permit; Hazardous waste storage facility permit.

Exemption: Hazardous waste does not include drilling muds or produced brines.

Standards and procedures: Note: The Kansas law was amended in 1979 to authorize collection of substantial fees (\$.25 per cubic foot of hazardous waste) to fund a perpetual care trust fund for hazardous waste disposal sites. Some other changes were made which are not reflected yet in the regulations described below. Check the latest regulations on this subject.

1. Generators: Generators must notify the department of their hazardous waste generation at least 2 weeks before generation begins, describing the process that creates the waste, its physical and chemical composition, the amount produced, and the names of transporters or facilities used to dispose of the waste. In addition, generators are responsible for labeling the waste and for initiating a hazardous waste manifest describing the waste shipment, and submitting to the state every month copies of all manifests. Disposal of hazardous waste requires prior authorization from the department; routine, recurring disposal may be authorized for up to one year. The generator must arrange for disposal in an approved facility before shipping the waste off-site.

Kansas (cont.)

2. Storage: Storage of hazardous waste on-site for more than 90 days requires a storage facility permit. Two general standards apply to storage:
 - a. containerization and handling to prevent releases to the environment
 - b. development and implementation of spill prevention and spill response plans.
3. Disposal Facilities: Hazardous waste facilities must meet a number of design and operating standards covering
 - surface water diversion; runoff collection
 - leachate prevention and monitoring
 - access control
 - testing of wastes
 - segregation of wastes
 - supervision of disposal
 - compliance with manifest system

The application for a facility permit must contain design plans and engineering reports signed by a registered professional engineer. The application must be submitted at least 30 days before start of operation.

7.6 KENTUCKY

AIR POLLUTION

Agency in charge: Department of Natural Resources
and Environmental Protection
Division of Air Pollution Control
275 East Main Street
Frankfort, Kentucky 40601

Phone: (502) 564-3410

Key laws or regulations: Air Pollution Control Regulations,
401 KAR 3:010 Section 7.

Emission limits: New fuel-burning equipment (indirect
heat exchangers):

Particulates:

- Visible emissions: 20% opacity
- Less than 10 MMBtu/hr: 0.56 lb./
MMBtu
- More than 250 MMBtu/hr.: 0.10 lb./
MMBtu

SO₂:

- Less than 10 MMBtu/hr:
Oil: 3.0 lb./MMBtu
Coal: 5.0 lb./MMBtu
- More than 250 MMBtu/hr.:
Oil: 0.8 lb./MMBtu
Coal: 1.2 lb./MMBtu

NO₂:

- More than 250 MMBtu/hr.:
- Gas: 0.20 lb/MMBtu
 - Oil: 0.30 lb/MMBtu
 - Coal: 0.70 lb/MMBtu

Oil-water Separators:

90% HC control by weight. (Applies
only if oil-water influent contains
more than 5 ppm H₂S or organic sul-
fides.)

Kentucky (cont.)

Permit required: Construction permit (for new or modified sources).

Permit application procedure: An application (signed by the owner or operator) for permission to construct or modify an air pollution source must be filed with the Division of Air Pollution. The information required may vary from case to case at the discretion of the Division, but will always include:

- identification of the source
- the types and amounts of pollutants to be emitted
- the control technology to be employed.

The permit will not be granted if the source will exceed emission standards for such facilities or if it will cause violations of ambient air quality standards.

If any member of the public alleges an adverse effect from the proposed facility, the Division must hold a hearing. No other hearings or notices are specified.

Enforcement: Violators of the Kentucky air laws and regulations may be penalized by a civil penalty of up to \$5000 per day of violation, and violations may also be enjoined by court order. Lesser penalties are provided for giving false information or other procedural violations.

WATER POLLUTION

Agency in charge: Department of Natural Resources
and Environmental Control
Division of Water
255 East Main Street
Frankfort, Kentucky 40601

Kentucky (cont.)

Key laws or regulations: Waste discharge permit regulations
401 KAR 5:005.

Permit required: State permit; NPDES permit from
U.S. EPA

Permit application
procedure: Permit application to the state
should be made at least 30 days
before the applicant wants to
begin construction. (Of course,
the application for the NPDES per-
mit should be filed 180 days in
advance.) The state application
must contain plans and specifica-
tions for the facility. It must
also contain assurances of proper
supervision of construction as
well as effluent monitoring cap-
ability. Certain special appli-
cation requirements apply to
facilities that will discharge
more than 50,000 gallons per day
(e.g., facility plan must be pre-
pared by a professional engineer).
Best practicable control tech-
nology is required in all cases,
with best available technology to
be installed by 1983.

Spills: The operator must notify the
Division of any spill immediately,
and follow up that notification
with a written report within 10
days.

Enforcement: The civil penalty for any viola-
tions of permit terms or effluent
limitations is up to \$5,000 per
day of violation. All violations
may be enjoined by court order.
The state may also recover for
injury to fish or wildlife.

UNDERGROUND INJECTION

Agency in charge: Department of Mines and Minerals
Division of Oil and Gas
P.O. Box 680
Lexington, Kentucky 40586

Kentucky (cont.)

Key laws and regulations: 805 K.A.R. 1:020

Permit required: Certificate of compliance.

Permit application
 procedure: The Kentucky Division of Oil and Gas issues one permit to oil production facilities to cover all phases of their operation. This permit, however, does not apply to injection for production or disposal. No separate permit is required, but the operator must file with the Division a "Certificate of Compliance" with the drilling procedures and well completion standards established by the Division before injection begins. This certification procedure is intended to insure the protection of freshwater.

The Department of Natural Resources is the lead agency in Kentucky for the new UIC program under the federal Safe Drinking Water Act. The Division of Oil and Gas will be working with the Department of Natural Resources on those parts of the program affecting oil production.

HAZARDOUS WASTE

Agency in charge: Department of Natural Resources
and Environment Protection
Division of Solid Waste
275 East Main Street
Frankfort, Kentucky 40601

Key laws or regulations: Kentucky Environmental Protection Law, §§224.855, 890;
Kentucky Solid Waste Regulations,
401 KAR 2:010

Permit required: For disposal of hazardous waste.
For disposal facilities.

Kentucky (cont.)

Discussion:

The Environmental Protection Law defines hazardous waste as waste that may create a threat to the public health or to animal life. Persons collecting, hauling, or disposing of hazardous waste need a permit, good for one year. The application form requires a description of the nature of the waste and the disposal location.

To obtain a permit as an approved disposal facility, the operator must apply under the Solid Waste Regulations. At a minimum, the application will require:

- name, address, and phone number
- map
- plans and plot plans
- description of soil conditions
- waste type
- bond for \$3000 plus \$500 per acre of land used for waste disposal.

The landfill must be located away from the 5-year flood zone and be protected against the 100-year flood. Subsoil structure and diking and grading must prevent groundwater and surface water contamination.

Note: Because of recent well-publicized problems in Kentucky with improper hazardous waste disposal, stricter regulations are likely in the near future.

7.7 LOUISIANA

AIR POLLUTION

Agency in charge: Louisiana Air Pollution Control
Commission
P.O. Box 60630
New Orleans, Louisiana 70130

Phone: (504) 568-5122

Key laws or regulations: Louisiana Air Control Law
R.S. 40:220-2216

Regulations of the Air Control
Commission

- Regulation 6 - Permits

Emission limits: Particulates:

- Visible emissions: 20% opacity
except for 4 consecutive minutes/
hour.

- Fuel-burning equipment: 0.6 lb/
MMBtu

SO₂:

Not more than 2000 ppm concentration
at standard conditions.

Volatile Organic Compounds:

Crude oil or condensate storage
tanks of less than 420,000 gallons
and all tanks storing crude prior
to custody transfer are exempt from
VOC emission controls.

Permit required: For construction, modification or
relocation.

Permit application
procedure: The owner or operator must submit
to the Air Control Commission an
Application for Approval of Emis-
sions and a completed Emissions
Inventory Questionnaire. The appli-
cation requires information about:

- location
- general description of facility

Louisiana (cont.)

- identification of emission points
- summary of effects of emissions on ambient air quality
- proposed control systems.

The emissions inventory is a more detailed form covering such information as:

- fuel use
- materials processed
- types and quantities of emissions
- precise facility location for dispersion modeling
- compliance status
- refuse disposal
- facility personnel

If the level of emissions is low, the application may be processed by the Technical Secretary of the Commission without further studies or procedures. However, if the level of emissions is significant, the Technical Secretary may also require a detailed ambient air quality analysis, including a dispersion modeling analysis, and the full application will be reviewed by the full commission. Facilities for the storage of volatile organic compounds will have their application approved by the Technical Secretary as long as they meet minimal design standards.

The Technical Secretary may grant a variance allowing site preparation activities to proceed after an application is filed, but the risk of such pre-approval activities is entirely on the applicant.

Louisiana (cont.)

"Major" sources such as large steam generators will be subject to more elaborate review requirements under new Louisiana rules (if approved by EPA) or through EPA directly.

Semi-annual reports showing compliance with all regulations must be submitted to the Commission in January and July.

Enforcement:

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

1. Conciliation/persuasion.
2. If conciliation or persuasion fails, the Technical Secretary may file a formal complaint, leading to a hearing before the Air Control Commission. The Commission will make "recommendations."
3. If "recommendations" are not followed, the Commission will issue an "order."
4. If the order is violated, the Commission may refer the case to the attorney general for court action seeking an injunction and/or penalties of up to \$2000 per day.

WATER POLLUTION

Agency in charge:

Louisiana Stream Control Commission
P.O. Drawer FC
University Station
Baton Rouge, Louisiana 70893

Key laws or regulations:

Stream Control Commission Rules Governing Disposal of Waste Oil, Oil Field Brine, and All Other Materials Resulting from the Drilling for, Production of, or Transportation of Oil, Gas, or Sulphurs.

Louisiana (cont.)

Permit required:

State discharge permit;
NPDES permit from U.S. EPA.

Discussion:

Louisiana generally prohibits the discharge of any waste fluids from oil production activities. However, where the discharge would be to brackish or salt water (not fresh water), a permit may be granted by the Commission to allow surface discharge if the oil content of the effluent is less than 30 parts per million. This permit or certificate is in addition to the NPDES permit that the facility will need from the U.S. EPA, Region VI in Dallas, Texas. (See discussion of the NPDES, section 3.3)

Spills:

The Stream Control Commission's Rules Relating to Oil and Gas emphasize prevention of and containment of spills. Oil tanks must be diked or ditched to a collecting swamp. Wells over marshes or water and transfer points must have impervious decks and spill collection systems. The rules direct immediate collection of spilled oil.

Enforcement:

The Commission may issue notices of violation and orders to correct violations. Violations of the law or the Commission's orders may lead to suit by the attorney general to impose fines of \$100-\$2,000 per day. The Commission may also recover damages for injury to wildlife or for impairment of the use of a stream.

UNDERGROUND INJECTION

Note: The rules described here apply to salt water disposal only at this time. Similar rules will presumably apply to other injection materials under the UIC program.

Louisiana (cont.)

Agency in charge: Louisiana Department of Conservation
Geological Oil and Gas Division
Baton Rouge, Louisiana

Key laws or regulations: Statewide Order Number 29-B
Section XV

Permit required: Salt Water Disposal Well Permit.

Permit application
procedure: The application for a salt water
disposal well permit may be made
in the form of a letter (in dupli-
cate) submitted to the local
District Manager. The letter must
contain:

- plats
- well logs
- casing descriptions
- daily volume to be injected
- a statement guaranteeing that
the disposal well and method
will protect fresh water sands
together with a schematic dia-
gram of the well showing cas-
ing and cementing.

The Louisiana Geological Survey will review the application and make recommendations to the Department of Conservation. No public hearing is required; the normal permitting time is about two weeks. Once the well is complete, the department of conservation will inspect it and provide the operator with a copy of the inspection report. (If the Louisiana Department of Conservation wishes to administer the UIC program under the Safe Drinking Water Act, it will have to amend these permit applications substantially. Be sure to contact the District Manager or the Department to learn the latest requirements.)

Louisiana (cont.)

HAZARDOUS WASTE

Agency in charge: Louisiana Department of Natural Resources
P.O. Box 44396
Baton Rouge, Louisiana 70804

Key laws or regulations: R. S. 30:1101-1116
Act 334 of 1978.

Department of Natural Resources
Hazardous Waste Management Plan.

Permit required: For certain activities or facilities.

Discussion: The new Louisiana hazardous waste control law and the regulations recently adopted under it closely follow the pattern of the federal law. Therefore, its significance for EOR is limited in the following ways:

- Underground injection is regulated separately. (See above.)
- Temporary storage (less than 90 days) is exempt from disposal facility regulations if storage is in an "environmentally safe container."
- The major burden of control is placed on transporters and disposal facilities.

Generator standards:

The principal effect for most EOR operators handling designated hazardous materials (mostly those employing chemical EOR processes) will be increased controls and resulting paperwork relating to proper labeling, storing, and shipping of these materials. For example, an operator must report to the Department of Natural Resources the quantity of brines and other wastes transferred to

others for off-site disposal. "Environmentally safe" temporary storage may be determined by the regulations that apply to disposal facility impoundments, basins, and storage tanks. Less strict standards may also be acceptable under some circumstances. The basic standard is to isolate the hazardous waste from the environment so that there is no risk of contaminating the soil or water.

Disposal facility permit and permit standards: A permit application to operate a hazardous waste disposal facility requires identification information (names, addresses, locations) and technical information on the following factors:

- site master plan
- layout and design
- geology (soils, subsurface formations, fresh water aquifers)
- hydrology (surface flow, wells, flood hazards)
- ecology (recreation areas, historic sites, wildlife areas)
- geography (population, land use)
- operations plans
- closure plans
- financial responsibility, including liability insurance of \$5 million for accidents and \$5 million general liability.

The facility design must meet standards on soil permeability, dikes and elevations, liners, monitoring wells, leachate monitoring, cover, closure, and the like.

7.8 MISSISSIPPI

AIR POLLUTION

Agency in Charge: Mississippi Air and Water Pollution Control Commission
P. O. Box 827
Jackson, Mississippi 32905

Key laws or regulations: Mississippi Air and Water Pollution Control Law, Mississippi Code, Title 49 Section 17; and Mississippi Air Pollution Control Regulations.

Emission limits: Particulates:
o Visible emissions: 40% opacity
o Fuel-burning equipment:
- Under 10 MMBtu/hr: 0.6 lbs/MMBtu
- Over 10 MMBtu/hr: Sliding scale from 0.6 to .20 lbs/MMBtu
SO₂: 4.8 lb/MMBtu
Other: No specific limits

Permit required: Construction and operation permits required, including existing facilities.

Permit application procedure: Submit a preliminary engineering study 30 days prior to application.

Application to construct must be submitted 90 days prior to start date for construction.

Upon completion of construction, the facility must be tested for air pollution limit compliance, then an operation permit is issued for 3-year period.

Mississippi (cont.)

Apply for operation permit revenue at least 90 days prior to expiration of 3-year permit period.

Enforcement:

Violations of the air pollution law and regulations may be penalized by civil penalties of up to \$5,000 per day, together with the costs for remedial or cleanup action. Intentional violations can result in criminal fines of \$2,500 to \$10,000 per day of violation.

WATER POLLUTION

Agency in charge:

Mississippi Air and Water Pollution Control Commission
P. O. Box 827
Jackson, Mississippi 32905

State Oil and Gas Board
P. O. Box 1332
Jackson, Mississippi 32905

Key law or regulations:

Mississippi Air and Water Pollution Control Law, Mississippi Code Title 49 Section 17; Mississippi NPDES Regulations; Oil and Gas Board Regulations.

Permit required:
Gas

State-issued NPDES permit; Oil and Gas Board permit for injection or disposal underground in oil and gas field operations.

Spills:

Oil & Gas Board regulations call for usual pits, basins, dikes, etc. to avoid spills.

Enforcement:

Violations of the water pollution laws and regulations may be penalized by civil penalties of up to \$5,000 per day, together with the costs of cleanup or remedial action. Intentional violations can result in criminal fines of \$2,500 to \$10,000 per day of violation.

Mississippi (cont.)

UNDERGROUND INJECTION

Agency in charge: State Oil and Gas Board
P. O. Box 1332
Jackson, Mississippi 32905

Key laws or regulations: Oil and Gas Board regulations

Permit required: Injection well or disposal well permit

Enforcement: Violations of the rules and regulations
may be enjoined by Court order and
there are provisions for monetary
fines.

HAZARDOUS WASTE

Agency in charge: Mississippi State Board of Health
Jackson, Mississippi 32905

Key laws or regulations: Mississippi Solid Waste Disposal Act
of 1974, Mississippi Code Title 17-Section
17 and Mississippi Solid Waste Manage-
ment Regulations

Permit required: Yes for handling, transporting, storing
or disposal of waste, both hazardous
and "solid" types.

7.9 MONTANA

AIR POLLUTION

Agency in Charge: State Dept. of Health & Environmental
Sciences
Environmental Sciences Division
Cogswell Building
Helena, Montana 59601

Key laws or regulations: Montana Clean Air Act, Revised Montana
Code, Title 69-Chapter 39; Montana
Air Quality Regulations.

Emission limits: Particulates:

- Visible emissions -
Not greater than 20% opacity.
(40% for sources installed on or
before 1/23/68.)
- Fuel-burning equipment

<u>Input</u> <u>(Million Btu/Hr)</u>	<u>Allowable Emissions (lb./MMBtu)</u>	
	<u>Existing Equipment</u>	<u>New Equipment</u>
Up to 10	.60	.60
Up to 100	.40	.35
Up to 1,000	.28	.20
Over 10,000	.19	.12

Sulfur in fuel - limitation is no
more than one (1) pound of sulfur
per MMBtu fired (liquid or solid fuels),
unless an SO₂ cleaning device is in-
stalled.

- Crude oil storage (over 65,000
gallons) - less than 2.5 psia vapor
pressure unless tank has floating
roof or vapor recovery system.

Permit required: Construction and operation (combined).
Permit is not required for units burning
liquid or gaseous fuels of less than
10 MMBtu/hr. or solid fuels of less
than 5 MMBtu/hr.

Montana (cont.)

Permit application
procedure:

Application is for air quality permit.
Must be submitted 180 days before
starting construction.

Before finishing construction a followup
construction report must be filed
to advise of changes from the permit
application, if any.

There are provisions for public hearings
on applications that require an environ-
mental impact statement.

An installation may be put into opera-
tion if construction filing procedures
are followed.

Enforcement:

Operational violations may result in
shutdown order (following a hearing
on 30 days notice) and fine of \$1,000
per day for each day of violation.

WATER POLLUTION

Agency in charge:

Montana Dept. of Health and Environmental
Sciences
Cosgswell Building
Helena, Montana 59601

and

Board of Oil and Gas Conservation
P. O. Box 217
Helena, Montana 59601

Key laws or regulations: Montana Water Pollution Control Law
Revised Montana Code, Title 69 - Chapter
48; Montana Water Quality Criteria
Regulations; Montana Pollutant Discharge
Elimination System Rules; Rules of
Board of Oil & Gas Conservation.

Permit required:

State-issued NPDES permit (or Montana
permit - "MPDES permit").
Board of Oil & Gas Conservation controls
permits for disposal of produced salt
water or stimulation of production
from oil and gas operations. Permits
have 5-year term.

Montana (cont.)

Spills: Each permit will establish procedures for reporting accidental discharges to State Dept. of Health.

Enforcement: Injunctions and civil fines.

UNDERGROUND INJECTION

Agency in charge: Board of Oil & Gas Conservation
P. O. Box 217
Helena, Montana 59601

Key laws or regulations: Board of Oil & Gas Conservation Regulations

Permit required: Board of Oil & Gas Conservation must issue permit for disposal of produced salt water, or for injection of water, gas or other material to stimulate production. Approximately 60 days to hear application.

HAZARDOUS WASTE

Agency in charge: Montana Dept. of Health and Environmental Sciences
Cogswell Building
Helena, Montana 59601

Key laws or regulations: Montana Solid Waste Management Act, Revised Montana Code, Title 69 - Chapter 40. Regulations not yet adopted.

Permit required: Implementing regulations to enforce the Act, including permitting procedures, have not yet been promulgated.

Enforcement: The Act provides for criminal fines of \$500 per day of violation and civil penalties of up to \$25,000 per day of violation.

7.10 NEW MEXICO

AIR POLLUTION

Agency in charge: Environmental Improvement Agency
P.O. Box 2348
Santa Fe, New Mexico 87503

Key laws or regulations: Environmental Improvement Board
Ambient Air Quality Standards
and Regulations.

Emission limits: Particulates:

New coal-burning equipment:

- Under 250 MMBtu/hr.: .26 to .56 lb./MMBtu, depending on size
- Above 250 MMBtu/hr.: .05 lb./MMBtu, including not more than .02 lb. fine particulates.

SO₂:

- Coal-burning equipment above 250 MMBtu/hr.: 0.34 lb./MMBtu
- Oil burning equipment above 1,000,000 MMBtu/year: 0.34 lb./MMBtu

NO₂:

- Coal-burning equipment above 250 MMBtu/hr.: 0.45 lb./MMBtu
- Oil burning equipment above, 1,000,000 MMBtu/year: 0.3 lb./MMBtu

HC and H₂S:

- Oil storage tanks larger than 20,000 gallons must discharge HC below liquid level or use equivalent control.
- Oil storage tanks larger than 65,000 gallons must use floating roof or vapor recovery (in or near municipalities, this rule applies to smaller tanks as well).

New Mexico (cont.)

Permit required: Preconstruction permit (new or modified sources) for any new or modified source that will emit more than 10 pounds per hour or 25 tons per year of any pollutant.

Permit application procedure: The applications must be filed at least 60 days prior to construction with the Director of the Environmental Improvement Agency. The application form requires information on:

- the nature and quantities of air pollutants
- process flow sheets
- description of air pollution control equipment
- projected operating schedule
- other information the agency may require

There is no public hearing or notice procedure; however, permit applications are on public file, and the public may comment on any application within 15 days. The agency has 30 days to grant or deny a permit or issue one with conditions.

Enforcement: Violations of the air pollution regulations may be penalized by civil penalties of up to \$1000 per day or may be enjoined by court order upon suit by the state.

WATER POLLUTION

Agency in charge: New Mexico Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

New Mexico (cont.)

Key laws or regulations: Oil Conservation Division, Rules and Regulations, Rule 313; Water Quality Act, Section 75-39-4.1

Permit required: NPDES (from U.S. EPA)

Discussion: The State's Water Quality Control Commission has no direct authority over EOR operations. State wastewater discharge requirements and spill notification requirements for oil producers are administered by the Oil Conservation Division. However, in exercising its jurisdiction, the Oil Conservation Division must follow the rules of the Water Quality Control Commission. These rules provide for permit application, limitations on discharges subject to federal effluent guidelines, and penalties for violations of the law or a permit, a system very much like the federal and other state systems. (See chapter 3.)

Wastewater surface discharges will require an NPDES permit from the U.S. EPA, Region VI in Dallas. (See section 3.3.) The state Water Quality Regulations exempt discharges covered by NPDES permits from most of their specific requirements. However, a Notice of Intent to Discharge must still be filed with the Oil Conservation Division, giving the owner/operator's name and address, the location of the discharge, the quantity of the discharge and the concentration of pollutants.

Spills: Notification of spills must be made to the Oil Conservation Division. Major spills must be reported immediately upon discovery to the district office. For minor spills, a written report in duplicate within 10 days is sufficient notification. Major and minor are defined as follows:

New Mexico (cont.)

Major:

1. Does not reach watercourse
lake or stream:

25 or more barrels of oil
100 or more barrels of salt
water
2. Reaches watercourse, lake or
stream:

1 barrel or more of oil
25 barrels or more of salt
water
3. Any quantity of hydrocarbons,
acids, etc., that may endanger
human health or damage property.

Minor:

1. Does not reach watercourse,
lake or stream:

5-25 barrels of oil
25-100 " of salt water
2. Quantities of other substances
that will not endanger health
or damage property.

Enforcement:

Violations of the Water Quality Act may be enjoined by court order. Violations of the Act or of any rule or regulation of the Oil Conservation Division may also be punished by a civil penalty of \$1,000 per day.

UNDERGROUND INJECTION

Agency in charge:

Oil and Conservation Division
Energy and Minerals Department
P.O. Box 2088
Santa Fe, New Mexico 87501

Key laws or regulations:

Oil and Conservation Division Rules
and Regulations.

Permit required:

Yes

New Mexico (cont.)

Permit application

procedure:

A memorandum issued by the Secretary/Director of the Oil Conservation Commission on August 24, 1977 states that the Commission has delayed revising the Rules and Regulations pending final EPA UIC program regulations. In the interim, the Commission will apply the following requirements to approval of injection wells:

1. No surface injection pressure greater than 0.2 psi per foot of depth to the top of the injection zone will be permitted (unless there is a strong evidence that the confining strata can withstand a greater pressure).
2. Applications must identify and provide data on all wells within one-half mile of the injection well that penetrate the injection zone.
3. Applications must include schematics of all plugged and abandoned wells within the one-half mile radius.

To apply for a permit to inject any material into a well, the applicant must supply:

- a plat showing the location of other wells within a two mile radius
- a log of the proposed injection well
- a diagram of the proposed well
- information about the injection zone and the injection fluid.

The application should be sent to the District Office of the Division. After receiving an application, the Division will issue public notice of a hearing on the

New Mexico (cont.)

application. The hearing will normally be held before an examiner, but certain cases may be heard by the full Commission. The hearing is conducted informally, but it is transcribed for the record.

Records and reports:

The operator of an injection well is required to maintain accurate records and to submit monthly reports on a prescribed form to the Division. The reports call for information on fluid volumes injected, stored, and/or produced.

Enforcement:

Violations of any rules and regulations of the Oil Conservation Division may be punished by a civil penalty of \$1000 per day.

HAZARDOUS WASTE

Agency in charge:

Environmental Improvement Division
Crown Building, P.O. Box 968
Santa Fe, New Mexico 87503

Key laws or regulations:

Environmental Improvement Division
Hazardous Waste Regulations

Permit required:

For disposal sites only.

Coverage:

The Hazardous Waste Regulations expressly exclude from their coverage any waste "the disposal of which is under the exclusive authority of the Oil Conservation Commission." At present, the Oil Conservation Commission regulates underground injection for enhanced recovery or for salt water disposal, but does not in so many words, regulate underground injection for disposal of chemicals used in EOR. Nevertheless, the most reasonable assumption is that the Oil Conservation Division Rules and Regulations (see Underground Injection, above), and not the Hazardous Waste Regulations, will govern underground disposal.

7.12 OHIO

AIR POLLUTION

Agency in charge: Ohio Environmental Protection Agency
450 East Town Street
Columbus, Ohio 43216

Key laws or regulations: Ohio Air Pollution Control Law
Ohio Permit System Regulations,
3745-31-01-08.

Emission limits: Particulates:

- Visible emissions: 20% opacity.
- Fugitive dust controls: (water-
ing unpaved roads, etc.).
- Fuel-burning equipment:

Under 10 MMBtu/hr.: 0.4 lb/MMBtu

Over 1000 MMBtu/hr.: 0.1 lb./MMBtu

SO₂:

Ohio has no state standard in force.
A new SIP with SO₂ limits is embroiled
in controversy at all levels and may
be disapproved by EPA.

NO_x:

Fuel-burning equipment above 250
MMBtu/hr.:

- Gas: 0.20 lb./MMBtu
- Oil: 0.30 lb./MMBtu
- Coal: 0.90 lb./MMBtu

HC:

- Oil storage tanks larger than
65,000 gallons must have vapor
recovery or floating roof.
- Oil/water separators processing
more than 200 gallons of oil
per day must have a solid cover
or floating roof or vapor
recovery.

Ohio (cont.)

Permit required:

Permit to install.

Exemptions:

- Oil or gas-fired heat exchanger of less than 1 MMBtu/hr. heat input.
- Storage of photochemically reactive substances of less than 500 gallons capacity.

Permit to operate:

Exemptions:

1. Sources with less than 25 tons per year potential emissions. However, such sources must still register with the Ohio EPA.
2. "Minor" sources (will be defined by rules) must apply for a permit, but do not need to receive one.

Permit application

procedure:

Permits to install are issued under Ohio's consolidated permit program. A single application serves to obtain permits for air emissions, water discharges, and solid waste disposal. The application will cost between \$65 and \$325, depending on the rate of emissions; the application should be filed at least 180 days prior to construction. The specific information required will vary with the type and size of the source, but will include the standard description of the facility, the emissions, and its control systems. The application should show compliance with all applicable standards and regulations.

Application for a permit to operate should be filed 90 days before expected start-up. The following information is required:

Ohio (cont.)

- Location
- Description
- Nature, source, and quantity of emissions, both uncontrolled controlled.
- Description of control equipment
- Evaluation of air quality impact

A new source which received a permit to install must also show compliance with all the terms of that permit. Performance tests to show compliance must be conducted soon after start-up; new sources can obtain conditional permits to operate for a shake-down period of up to 6 months.

The permit to operate is good for a fixed period of between 1 and 3 years.

Enforcement:

Enforcement is in the hands of the Ohio Attorney General, who will initiate enforcement actions at the request of the Ohio EPA. The attorney general may seek to enjoin violations, or he may request penalties of up to \$10,000 per day.

WATER POLLUTION

Agency in charge:	Division of Water Pollution Control Ohio Environmental Protection Agency 316 East Broad Street P.O. Box 149 Columbus, Ohio 43216
Key laws or regulations:	Ohio Administrative Code, Regulations 3745-33-01 through 10.
Permit required:	State-issued NPDES permit.

Ohio (cont.)

Permit application procedure: Ohio administers the NPDES program in the state. The Ohio regulations closely parallel the federal regulations, including exemption of any oil production related underground injection from the NPDES permit requirement. See the discussion of NPDES in section 3.3.

Spills: The Ohio law and regulations do not contain specific spill response instructions. However, as always, a spill constitutes an unpermitted discharge, against which the state may take enforcement action.

Enforcement: The Director of the Ohio EPA may issue orders to correct violations of the water laws or the permit. The attorney general, at the request of the EPA, may seek injunctions against violations. Violations of permits or discharges without permits are also subject to civil penalties of up to \$10,000 per day; criminal penalties for willful or knowing violations range up to \$25,000.

UNDERGROUND INJECTION

Agency in charge: Department of Natural Resources
Division of Oil and Gas
Fountain Square
Columbus, Ohio 43224

Key laws or regulations: Ohio Revised Code, chapter 1509
Division of Oil and Gas
Rules and Regulations, Chapter 1501: 9-3, 9-5.

Permit required: Operating permit.

Permit application procedure: Separate but similar rules apply to underground injection for enhanced recovery and underground injection of waste or salt water

disposal. The specific rule described here is the one relating to injection of materials for enhanced recovery.

The permit application to inject material to improve production should be sent to the Chief of the Division of Oil and Gas. The following information is required:

- a. Name and address and signature of owner. (If agent signs, include certificate of authorization.)
- b. Names and addresses of all owners of tracts being used in the EOR operation.
- c. Names and addresses of owners of all tracts within one-half mile of any well to be used.
- d. Date of application.
- e. Location of tracts.
- f. Written plan of EOR operations, including well casing and cementing for EOR wells and all other wells on the tracts, description of the injection zone, and the type, amount, and pressure of injection fluids.

Before filing the application, the applicant must send a copy of it by registered mail to each owner of tracts identified in the application. The owners then have 15 days to file written objections to the application with the Chief of the Division. If there are no objections and the proposed injection meets standards, the permit will be issued. If legitimate objections are made, then a hearing is required within 30 days, and the decision on the permit will be made after the hearing.

Operations must commence within 180 days after receiving a permit, or

Ohio (cont.)

the permit will expire. Any significant changes in operating procedure must be reported; if they conform to the regulations, the Chief will approve them in writing.

The general standard for evaluation is that EOR operations shall not contaminate the surface of the land, surface water, or underground water.

Note: The Division of Water Pollution Control of the Ohio EPA has been designated the lead agency for drafting regulations for a federally-approvable UIC program.

Enforcement:

Violations of the rules and regulations may be enjoined by court order. In addition, there are mandatory penalties of \$100-500 for first offenses and \$200-1000 for subsequent offenses.

HAZARDOUS WASTE

Agency in charge:

Division of Solid Waste
Ohio Environmental Protection Agency
450 East Town Street
Columbus, Ohio 43216

Key laws or regulations:

Ohio Solid Waste Disposal Law
Ohio Rev. Code, §§3734.01-11.

Permit required:

Yes

Discussion:

The Ohio Solid Waste Disposal Law was recently substantially amended to provide the Ohio EPA with the authority to adopt regulations to implement the requirements of RCRA. Although the new regulations have not yet appeared, they presumably will track the federal scheme closely; the law requires them to be "consistent with and no more stringent than" the federal regulations. The law also defines

Ohio (cont.)

hazardous waste exactly as RCRA does, and requires a license to operate a hazardous waste management facility. The annual permit fee may range up to \$1000. The general solid waste regulations now in effect stress total containment, prevention of water pollution, and prevention of any nuisance conditions.

7.11 OKLAHOMA

AIR POLLUTION

Agency in charge: Division of Air Pollution Control
State Department of Health
NE 10th and Stonewall
Oklahoma City, Oklahoma 73105

Key laws or regulations: Oklahoma Clean Air Act, 63 Okla
Stat. Chapter 30; Oklahoma Air Pollution
Control Regulations

Emission limits: Particulates

- o Visible emissions -
Not greater than 20% opacity.
- o Fuel-burning equipment

<u>Input</u> <u>(Million Btu/hr)</u>	<u>Allowable Emissions</u> <u>(lb/MMBtu)</u>
Up to 10	.60
Up to 100	.35
Up to 1,000	.20
10,000 and over	.10

SO₂: 0.2 lb/MMBtu from gas fuels
burning equipment

0.8 lb/MMBtu from liquid fuel-
burning equipment

1.2 lb/MMBtu from solid fuel-
burning equipment

NO_x: 0.20 lb/MMBtu from new gas-
fired fuel-burning equipment
rated over 50 MMBtu/hr.

0.30 lb/MMBtu from new liquid-
fired fuel-burning equipment
rated over 50 MMBtu/hr.

0.70 lb/MMBtu from new solid
fossil-fired fuel-burning
equipment rated over
50 MMBtu/hr.

Oklahoma (cont.)

Permits required:

Construction and operation permits required for all new stationary/portable facilities/sources from Commissioner of Health.

A separate application must be submitted for each new source and must contain site information, plans descriptions, specifications and drawings to show how the proposed new source is designed and how it will be operated and controlled. The application must show to the satisfaction of the Commissioner that (1) the operation of the new source will not cause a violation of applicable rules and regulations; (2) the new source has incorporated the best available control technology, so as to keep emissions to a minimum; (3) operation of the source will not endanger the maintenance of attainment of any applicable ambient air quality standard; and (4) the source will be provided with sampling ports, safe access to each port, monitoring equipment and other sampling and testing facilities if the Commissioner requires.

The Commissioner must act within 30 days to approve or deny an application and may grant a conditional authority to construct or modify if it appears that the source will comply with applicable rules and standards.

The Commissioner may cancel an authority to construct or modify if the proposed work has not begun within one year from the date of issuance or if the work has been suspended for a year or more. An applicant may obtain an extension of up to six months on the authority to construct or modify by submitting a written request to the Commissioner.

After completion of construction (or modification) no new source shall

Oklahoma (cont.)

begin operation without notifying the Commissioner at least 30 days prior to startup. Emission tests may be required at option of Commissioner before a permit to operate issues. Commissioner must act on an application for operation permit within 60 days after it is filed.

Exemptions = Fuel-burning device with input not in excess of 500,000 Btu/hr; also, internal combustion engines.

Enforcement:

Criminal penalties of up to one (1) year in jail and/or fines of \$500 per day of violations.

WATER POLLUTION

Agency in charge:

Water Resources Board
2241 NW 40th Street
Oklahoma City, Oklahoma 73112
(Regulates public wastewater and drinking water facilities)

and

Department of Pollution Control
Water Quality Control Division
NE 10th and Stonewall
Oklahoma City, Oklahoma 73105
(This is the principal pollution control agency)

Key laws or regulations: Water Pollution Control Act of 1955, 82 O.S. Section 931, et seq.; Pollution Control Coordinating Act of 1968; 82 O.S. Section 1000, et seq.; Oklahoma Water Quality Standards adopted by Water Resources Board.

Permit required:

NPDES permit from EPA. Waste discharge permit from Water Resources Board.

Spills:

Any accidental or emergency spill of pollutants which may enter the waters of the State must be reported immediately to the Department of Pollution Control.

Oklahoma (cont.)

Spills of salt water or produced hydrocarbons from oil and gas operations are reported to the Oklahoma Corporation Commission, Jim Thorpe Office Building, Oklahoma City, Oklahoma 73105.

Enforcement:

Department of Pollution Control can seek an injunction to prevent violations of statutes and regulations. Criminal penalties may be imposed by imprisonment for up to 90 days and/or fines of \$500 per day for first 10 days of violation and \$1000 per day for each day thereafter. Pollution from oil and gas operations can also result in a cease-and-desist or shutdown order from the Corporation Commission.

UNDERGROUND INJECTION

Agency in charge:

State Corporation Commission
Jim Thorpe Office Building
Oklahoma City, Oklahoma 73105

Key laws or regulations:

Oklahoma Oil & Gas Laws, Title 52,
O.S.A. Sections 139, 310 et. seq.;
Rules and regulations adopted by
Corporation Commission.

Permit required:

For salt water disposal and injection
for production.

Permit application
procedure:

For injection for oil and gas operations, including EOR production purposes, the operator must apply to the Corporation Commission for approval. The Commission will establish the drilling, completion and operating procedures to protect water resources. Hearing date will usually be about 60 days following the filing of an application.

Oklahoma (cont.)

HAZARDOUS WASTE

Agency in charge: State Department of Health
Industrial and Solid Waste Division
P. O. Box 53551
Oklahoma City, Oklahoma 73105

Key laws or regulations: Oklahoma Solid Waste Management Act,
63 O.S. Section 2251, et seq.; Oklahoma
Controlled Industrial Waste Disposal
Act, 63 O.S. Section 2751, et seq.;
Oklahoma Solid Waste Management Regu-
lations; Oklahoma Industrial Waste
Management Regulations.

Permit required: For construction and operation of
waste processing facilities or disposal
sites, including injection well
disposal sites.

Standards and
procedures: Controlled industrial waste includes
flammable liquids, spent acids, sludge
and tank bottoms, and toxic organic
chemicals.

Applications for construction and
operation of disposal sites or proces-
sing facilities are quite detailed,
requiring full engineering data, con-
struction plans, and proposed operating
procedures.

On-site storage of hazardous waste
is also subject to specific regulations
and time limits (not exceeding 2 years).

Transportation of hazardous waste
is subject to registration with the
Department of Health.

There are continuous recordkeeping
requirements for all phases of hazardous
waste handling.

7.13 PENNSYLVANIA

AIR POLLUTION

Agency in charge: Department of Environmental Resources
Air Quality Control Bureau
Harrisburg, Pennsylvania 17120

Key laws or regulations: Pennsylvania Air Pollution Control
Act (P.C. 2119), Section 6

 Pennsylvania Code Title 25,
 subpart C, Art. III, Ch. 127.

Emission limits: Particulates:

 Fuel combustion equipment:

- Between 2.5 and 50 MMBtu/hr.:
 0.4 lb./MMBtu
- More than 600 MMBtu/hr.:
 0.1 lb/MMBtu

 Visibile emissions: 20% opacity,
 except not more than 60% for 3
 minutes/hour.

SO₂:

 Fossil-fuel combustion units:

- Oil: Between 0.6 and 4.0 lb/MMBtu
 depending on location (lowest
 level applies in S.E.
 Pennsylvania)
- Coal: Between 0.75 and 3.7 lb./
 MMBtu

Sulfur-in-fuel limits: Between 0.2
 and 2.8% sulfur by weight, depend-
 ing on grade of fuel and location
 of source.

Permit required: Plan Approval
 Permit to Operate

Exemption: fuel combustion sources
 of less than 2.5 MMBtu/hr. heat
 input.

Pennsylvania (cont.)

Permit application

procedure:

Anyone planning to construct, install, or modify any stationary air pollution source must apply for a Plan Approval and Permit to Operate from the Air Quality Control Bureau. The application typically takes about six to eight weeks to process. (Remember that "major sources" like steam generators will be subject to the more elaborate review required by the Federal Clean Air Act.) The application form requires information on:

- fuel type and characteristics
- combustion controls
- volume of emissions
- compliance with laws and regulations
- ambient air quality effects
- air pollution monitoring facilities
- emergency emission reduction plans.

Also required is a brief description of solid waste and wastewater disposal, and an indication whether permits for those activities will be required.

The permit to operate must be obtained after construction and before operation. (Temporary permits are available for start-up and shakedown.) The applicant must show proper construction (in accordance with the plan approval) and an ability to achieve emission limitations. Some requirements for monitoring or testing capability may also be imposed.

Pennsylvania (cont.)

Enforcement:

Violators of the laws or regulations may be prosecuted in court. If a conviction is obtained, the minimum penalty is \$100; the maximum, \$1000. The state Environmental Hearing Board has the power to assess civil penalties up to \$10,000 plus \$2,500 for each day the violation continues. The department may also request civil litigation by the attorney general for violations of orders.

WATER POLLUTION

Agency in charge:

Department of Environmental Resources
Bureau of Water Quality Management
P.O. Box 2063
Harrisburg, Pennsylvania 17120

Key laws or regulations:

Pennsylvania Industrial Waste Regulations
Pennsylvania Code Title 25, Part I, Art. 2, Chaps. 92, 97.

Permits required:

State-issued NPDES permit.

Discussion:

The Pennsylvania Bureau of Water Quality Management administers the NPDES program within the state. In addition to the permit regulations Pennsylvania has specific rules that apply to oil wells. The overall purpose of the rules is to prevent oil wastes from reaching any waters of the state. The rules require oil wells to have:

- sumps large enough to receive all drill cuttings, water, and oil which may be produced in drilling or cleaning wells (accumulated sediment is to be burned or disposed of).
- sump overflow device to discharge water free of solids
- domes or other measures for containing oil

Pennsylvania (cont.)

- waste tanks for salt water, oil, etc., discharging into sumps or other settling devices.

They also require that cleaning operations be conducted to prevent drainage of wastes into water. The disposition of non-oil wastes is not regulated by these rules.

The Pennsylvania spill regulations require the person in charge of the source of the spill immediately to notify the appropriate regional office of the Department by telephone and to take steps to prevent environmental and property damage. Removal must be completed within 15 days. Impoundments of oil or hazardous substances must be structurally sound, impermeable, maintain a 2-foot freeboard, and be protected against unauthorized acts, so as to prevent spills or leakage. Impoundments of over 250,000 gallons (or over 500,000 gallons total capacity at a site) must receive a permit before construction.

Enforcement:

The Department may issue orders to correct violations of the law. The Department may also impose, after a hearing, civil penalties of up to \$10,000 per day for violations of the law or permit terms.

UNDERGROUND INJECTION

Agency in charge:

Department of Environmental Resources
Bureau of Water Quality Management
P.O. Box 2063
Harrisburg, Pennsylvania 17120

Pennsylvania (cont.)

Key laws or regulations: Pennsylvania Industrial Waste Regulations;
Pennsylvania Code Title 25, Part I, Art. 2, Chap. 97.

Permit required: Yes.

Permit application procedure: In Pennsylvania, underground disposal is generally managed like any other wastewater discharge. A permit for underground disposal may be applied for and will be processed under the Pennsylvania NPDES regulations. (See above.)

As a matter of policy, Pennsylvania regards underground disposal as a potential source of pollution. To acquire a permit, therefore, the applicant must show by logs and analysis of the regional stratigraphy that no pollution of water is likely to occur. Two types of disposal are absolutely prohibited: disposal of untreated waste into active or abandoned mines, and disposal into abandoned wells.

HAZARDOUS WASTE

Agency in charge: Department of Environmental Resources
Bureau of Land Protection and Reclamation
Division of Solid Waste Management
Harrisburg, Pennsylvania 17120

Key laws or regulations: Pennsylvania Solid Waste Regulations
Pennsylvania Code Title 25, Part I, Art. 1, Chap. 75.

Permits required: For disposal sites.

Discussion: Pennsylvania law defines hazardous waste exactly as RCRA does. The Department has special regulations for the handling of hazardous waste, but they do not specify general requirements. Instead, the

Pennsylvania (cont.)

handling of hazardous materials must simply be in a manner approved by the Department on a substance-by-substance basis. The one specific requirement is that the generator disclose the hazardous nature of the waste to a transporter or disposer.

Hazardous waste disposal facilities must receive a permit and are governed by the state standards for sanitary landfills. These state standards go into elaborate detail on grading, cover soils, liners, access roads, etc. Generally, facilities must provide protection against surface runoff, leaching of wastes, and unauthorized access.

7.14 TEXAS

AIR POLLUTION

Agency in charge:

Texas Air Control Board
8520 Shoal Creek Boulevard
Austin, Texas 78758

Key laws or regulations: Texas Clean Air Act, Section 3.27
and 3.28.
Texas Permit System Procedures
Texas Regulation VI

Emission limits:

Particulates:

- Visible emissions -
Not greater than 20% opacity.
- Fuel-burning equipment for steam
generator with a heat input greater
than 2500 MMBtu/hr
 1. Solid fossil fuel - limit of
0.3 lb/MMBtu
 2. Oil or gas fuel - limit of
0.1 lb/MMBtu

Exemptions:

1. Gas fired internal combustion
engines of less than 2000 hp
and engine trains of less than
5000 hp.
2. Natural gas and LP gas fired
combustion units with rated fuel
consumption less than 10,000
Standard cubic ft/hr.
3. Certain gas dehydration units
4. Petroleum production tanks or
battery storing less than 10,000
bbl -if at least 1/4 mile from
third-party facilities.

Non-particulates:

SO₂: Variable depending upon location, stack height and capacity of equipment.
Check with Executive Director.

NO_x: For gas fired steam generating units of more than 600,000 lb/hr steam capacity:

<u>Type Firing</u>	<u>Max. NO_x emission</u>
Opposed fired	0.7 lbs/MMBtu
Front fired	0.5 lbs/MMBtu
Tangential fired	0.25 lbs/MMBtu

Permits required: Permit to Construct
 Permit to Operate

Exemptions:

- gas fired internal combustion engines of less than 2000 hp
- petroleum production sweet crude oil tanks or batteries of less than 2500 bbl. capacity
- any petroleum production crude oil tanks or batteries of less than 10,000 bbls. capacity that capture all hydrocarbon and sulfur compounds.
- gas-oil separators
- temporary separators and heaters used during exploratory or testing phases of production.

Permit application
 procedure:

For sources requiring a permit, the application form may be obtained from the Air Control Board. It requires both general source information and source-by-source engineering information. Permit applications will be.

Texas (cont.)

reviewed by an engineer, and will then be forwarded to the Executive Director of the Board who is authorized to grant or deny the permit. The decision of the Executive Director may be appealed to the full Board. The latest Texas rules incorporate most of the elements of the EPA permit program. The permit application must show that the source will use the best available control technology. The Board will also require evidence that the source can achieve the emission rates shown in the application. The source will be held to any statements, claims, or commitments made in the permit application.

Since some Texas counties are non-attainment areas for ozone, VOC emissions must be offset in those counties (Bexar, Dallas, El Paso, Harris, Nueces, and Tarrant). Major operators with multiple sources may "bank" any emission reductions (including source shutdowns) to offset against later increases from new or modified sources. Credits must be specified in permit applications.

The permit to operate must be applied for within 60 days after beginning operation. This application will be reviewed to determine compliance with air regulations and with the terms of the construction permit.

Enforcement:

The Air Control Board may issue orders to correct violations. Court enforcement action against violations may also be initiated by the Air Control Board or by the local government. The court may enjoin the violation, and must assess a civil penalty of \$50 - \$1,000 per day of violation.

Texas (cont.)

WATER POLLUTION

Agency in Charge:

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Austin, Texas 78711

Key laws or regulations:

Texas Water Quality Act, V.T.C.A.
Title 2; Railroad Commission's Rules
Having Statewide General Application
to Oil, Gas & Geothermal Resource
Operations Within the State of Texas,
Rule 8.

Permit required:

Discharge permit; NPDES permit from
U.S. EPA.

Permit application
procedure:

Under the Texas Water Quality Act,
the Oil and Gas Division of the Rail-
road Commission is "solely responsible"
for the control of pollution of sur-
face water from oil production activ-
ities. However, the permits issued
by the Oil and Gas Division must pro-
tect the water quality standards set
by the Department of Water Resources.

Rule 8 of the Oil and Gas Division
statewide rules declares a general
policy against discharge of production
wastes to surface waters. The rule
leaves open the possibility of a per-
mit for such surface disposal if the
operator can show a need for it.
The rule also does not directly address
the discharge of wastes other than
oil, brines, and mineralized waters.
Note also that Rule 8 prohibits on-
site permanent disposal pits for salt
water and mineralized water.

Spills:

Subchapter G of Chapter 26 of the
Texas Water Quality Act contains spill
notification and clean-up requirements
that coordinate closely with the EPA
spill program. The Texas rules apply
only to counties with tidewater areas.
Immediate notification and clean-up
and abatement efforts are required.

Texas (cont.)

Enforcement:

The Railroad Commission exercises enforcement jurisdiction over all activities under its authority. Their enforcement program has five steps, although usually the first step is sufficient to correct the problem. The five steps are:

1. Notice of violation, usually a phone call to the lease operator.
2. Pipeline severance - no oil may be sold off-lease.
3. Zero allowable-production halted, oil confiscated if produced.
4. Show-cause hearing to receive testimony, leading to an order from the Commission.
5. Referral to the attorney general for appropriate action, including penalties up to \$1000 per day.

UNDERGROUND INJECTION

Agency in charge:

Railroad Commission of Texas
Oil and Gas Division
P. O. Box 12967
Austin, Texas 78711

Key laws or regulations: Texas Water Quality Act, Chapter 27

Railroad Commission's Rules Having
Statewide General Application to Oil,
Gas and Geothermal Resource Operations
Within the State of Texas, Rules 9,
46.

Permit required:

Yes.

Permit application
procedure:

Rule 46 of the Statewide Rules applies specifically to EOR fluid injection. The rule requires the operator to submit an application on a prescribed form which must be signed by a person "knowledgeable of the facts." The

Texas (cont.)

applicant must also notify all other operators of wells in the reservoir of the application, and submit copies of those notifications to the Oil and Gas Division along with the application. Applications will be held for ten days, during which time other persons can contest the application. If the application is uncontested, it will be processed administratively; if contested, it will be set down for hearing by a public notice from the Commission.

Similar procedures apply under Rule 9 relating to salt water disposal wells. Rule 9 is more specific in its standards, however, requiring casing and cementing to protect fresh water and an analysis of the underground hydrology and geology. An additional requirement here is that the applicant must submit to the Oil and Gas Division a letter from the Texas Department of Water Resources in Austin stating that the injection zone is not fresh water bearing and that the use of the injection formation for salt water disposal will not endanger fresh water strata.

(These rules will undoubtedly be modified in the future to reflect the final requirements of EPA's UIC program under the Safe Drinking Water Act.)

HAZARDOUS WASTE

Agency in charge:

Railroad Commission of Texas
Oil and Gas Division
P. O. Box 12967
Austin, Texas 78711

Note: The Texas Solid Waste Disposal Act and the Texas Industrial Solid Waste Regulations of the Water Quality

Texas (cont.)

Board expressly exclude from their coverage disposal of materials resulting from "activities associated with" the production of oil. These are under the jurisdiction of the Railroad Commission. Rule 8 of the Railroad Commission's Rules having Statewide General Application contains several provisions relating to solid waste disposal. On-site disposal pits for salt water or mineralized waters are not allowed. These wastes must be shipped off-site by pipeline or through use of licensed waste haulers. The method of disposal is the lease operator's responsibility, but it must be approved by the Railroad Commission in advance.

7.15 WEST VIRGINIA

AIR POLLUTION

Agency in charge: West Virginia Air Pollution Control
Commission
1558 Washington Street, East
Charleston, West Virginia 25311

Phone: (304) 348-3286

Key laws or regulations: Air Pollution Control Regulations
Regulation XIII.

Emission limitations: SO₂ for fuel burning equipment:
3.1 or 3.2 lb/MMBtu, except
Kanawha Valley area, which is
1.6 lb/MMBtu.

Permits required: Construction permit.

Exemptions:

- fuel-burning units of less than
10 MMBtu/hr. heat input
- internal combustion engines
- sources of "minor significance."

Permit application
procedure:

A permit is required for the construction, modification, or relocation of an air pollution source. The permit application must be filed 90 days in advance of expected construction with the Director of Air Pollution Control Commission. The forms may be obtained from the Commission. The owner or operator must sign the application. The application calls for:

- site information
- plans
- specifications
- projected types and amounts of
air pollutants
- sources of fugitive dust

West Virginia (cont.)

- details of pollution control equipment to be used.

As a blanket rule, the source must use the "best available technology."

Unlike most other state or federal regulations, the 90-day time limit for administrative action on the application has a legal effect: if the Director has neither issued nor denied a permit after 90 days, construction may proceed in accordance with the information in the application.

The public gets notice of a permit application in two ways. First, as part of the application the applicant must publish a legal notice in a local newspaper. Second, the Director must maintain a public file of applications received, and each application must be in that file for at least 30 days before a permit may be issued.

Enforcement:

The Director of the Air Pollution Control Commission may issue cease and desist orders to any facilities violating the law or the regulations, setting a reasonable schedule for compliance. The source owner may appeal any order before the full commission. Violations of a cease and desist order may be prosecuted in court. The court may impose a penalty of up to \$1,000 per day or enjoin the violation.

WATER POLLUTION

Agency in charge:

Office of Oil and Gas
Department of Mines
1613 Washington Street, East
Charleston, West Virginia 25311

Division of Water Resources
Department of Natural Resources
Charleston, West Virginia 25305

West Virginia (cont.)

Key laws and regulations: Oil and Gas Laws, W. Va. Official Code §§1, 12b; West Virginia Administrative Regulations Chapter 22-4, Sections 9 and 23.

Permits required: State discharge permit; NPDES permit from U.S. EPA.

Discussion: In general, West Virginia does not allow surface water discharges from oil production facilities. Section 9 of the regulations prohibits discharge of brines and other waste waters unfit for livestock or general use. Section 23 requires drilling to be conducted so as to prevent discharges or runoff from entering state waters. Permits for such discharges as may be allowable (e.g., sanitary waste) must be obtained from the Department of Natural Resources at the state level, and from EPA Region III at the federal level.

Spills: Any spills must be reported "promptly" by telephone to the Division of Water Resources. The telephone report should provide information on the size, location, and time of the spill, clean-up measures being taken, and measures to prevent a recurrence of the spill. The Division may require a written report as follow-up.

Enforcement: Primary enforcement responsibility rests with the oil and gas inspector for the area (there are 12 inspectors state-wide). When the inspector detects a violation, he instructs the operator to abate the violation within a reasonable time. If the violation is not abated and the inspector refuses an extension of time, he issues the operator written findings and an order to cease production. The operator may appeal the inspector's order to the deputy director of the

West Virginia (cont.)

office of oil and gas, and from there to the courts. Orders not appealed, or reaffirmed on appeal, must be complied with. Violations of orders are criminal misdemeanors punishable by fines (up to \$2000) or imprisonment (up to 1 year). The department of mines may also sue in state court for an injunction.

The Division of Water Resources also has authority to issue orders for violations of the water pollution laws, and to order cessation of production. The division may also recover damages for injury to wildlife caused by a violation.

UNDERGROUND INJECTION

- Agency in charge: Office of Oil and Gas
Department of Mines
1613 Washington Street, East
Charleston, West Virginia 25311
- Key laws or regulations: Oil and Gas Laws, W. Va. Official
Code §§22-4-2b, 10a;
West Virginia Administrative
Regulations Chapter 22-4, sections
8, 9, 11.
- Permit required: Permit to drill or convert a well.
- Permit application
procedure: The rules apply equally to wells
for injection and wells for waste
disposal. To apply for a permit,
the operator must file with the
Office of Oil and Gas a plat and
a "Pre-Operation Certificate,"
Form IV-37. In addition, the
applicant must submit a bond for
\$2500 payable to the state for
each well, or \$15,000 for a blanket
bond. Cash deposits may be sub-
stituted for the bond.

West Virginia (cont.)

The plat (an original and one copy of Form IV-6) must contain (or be accompanied by) the following information:

- location of tract
- acreage
- adjacent land owners
- well location
- location of all other wells in area
- casing records (if available)
- drilling log (if available)
- maximum injection pressure
- geological formation
- description of liquids to be injected
- location of water-bearing horizons

Regulation 11 provides further details about size, scale, and detail of the plat. The plat must be prepared by a professional engineer or registered land surveyor. If the area is underlaid with coal, the applicant must send copies of the plat to all coal operators in the area. The office of oil and gas will also send a copy to the division of water resources for comment.

If no objections are received within 30 days, the permit will be issued "forthwith". If objections are made, a hearing must be held.

West Virginia (cont.)

HAZARDOUS WASTE

Agency in charge: State Board of Health
Charleston, West Virginia 25305

Key laws or regulations: Solid Waste Disposal Regulations,
Chap. 1, Art. 12.

Permit required: Disposal facility permit.

Discussion: The regulations define hazardous wastes as toxic wastes or wastes with special water pollution potential. Hazardous wastes are designated Class I, and must be incinerated or landfilled in a facility licensed to handle Class I waste. The regulations specifically state that, "The requirements for Class I waste disposal shall be determined separately for each application." General guidelines on landfill design are available from the Department of Health (Bulletin SWP-D1 -- "Design Standards for Solid Waste Disposal").

7.16 WYOMING

AIR POLLUTION

- Agency in charge: Department of Environmental Quality
Division of Air Quality
Hathaway Building -- #117
Cheyenne, Wyoming 82002
- Key laws or regulations: Wyoming Environmental Quality Act,
§§35-11 - 110 to 114. Wyoming Air
Quality Standards and Regulations,
section 21.
- Emission limits:
- SO₂ from fuel burning equipment
units with heat input of 250
MMBtu/hr. or more constructed
after January 1, 1974:
 - Oil: 0.2 lb/MMBtu
 - Coal: 0.8 lb/MMBtu
 - H₂S gas streams shall be vented,
incinerated, flared or disposed
of to meet ambient standards
(40 $\mu\text{g}/\text{m}^3$ 1/2 hr. average;
70 $\mu\text{g}/\text{m}^3$ 1/2 hr. average not to
be exceeded more than twice in
any five days).
 - HC: no controls on crude storage;
floating roofs or vapor recovery
for storage of distillate more
than 68,000 gallons.
 - NO_x from new fuel burning equip-
ment except internal combustion
engines with heat input of less
than 200 MMBtu/hr.:
 - Gas: 0.20 lb/MMBtu
 - Oil: 0.30 lb/MMBtu
 - Coal: 0.70 lb/MMBtu

Wyoming (cont.)

- Particulate controls:

- Visible emissions: never more than 40% opacity. No more than 6 minutes/hour greater than 20% opacity. Diesel engines below 7500 feet elevation: not more than 30% opacity.

Permits required:

Construction permit; operating permit.

Construction permits from the Department of Environmental Quality are required for new facilities and for the modification of existing sources. One limited exemption is important for EOR operators: permits are not required for small fuel-burning installations (less than 10 MMBtu/hr. heat input for most fuels; less than 25 MMBtu/hr. for gaseous fuels containing not more than 20 gr./100 SCF total sulfur). All facilities must have operating permits.

(Note: The Wyoming regulations have been approved by EPA. Therefore, there is no need to deal directly with EPA to obtain air permits.)

Permit application
procedure:

The permit application must be on a form provided by the Division of Air Quality. Information required includes:

- site information
- plans
- specifications
- the nature and amount of emissions
- design drawings
- manner of operation and control
- construction schedule.

Ambient air quality monitoring may be required at the discretion of the Administrator. Major sources

Wyoming (cont.)

such as thermal EOR steam generators will probably need to conduct ambient monitoring, which typically must be done for one year prior to application under a monitoring program reviewed and approved by the Division.

To obtain a permit, the applicant must show:

- Compliance with all rules and regulations
- Attainment and maintenance of ambient air quality standards
- No significant deterioration of air quality
- Location in accordance with land use planning
- Application of the best available control technology
- Emissions measuring equipment
- Performance claimed in application will be achieved
- No interference with visibility protection

The Division must determine the completeness of the application within 30 days. Once the application is accepted as complete, the Division has 60 days to issue a proposed permit. The proposed permit is put out to public notice for a 30-day comment period and an opportunity to request a hearing. A hearing will be held only if there is sufficient interest.

Construction must begin within 24 months after a permit is issued. The permit holder must notify the Division between 30 and 60 days in advance of expected start of operation, and must also give notice within 15 days after actual start-up.

Wyoming (cont.)

In addition to a construction permit, a facility needs an operating permit. This must be applied for within 90 days of start-up or within 30 days of achieving maximum production rate. It will be granted based on performance tests and demonstrations of compliance with the construction permit and Wyoming regulations.

Enforcement:

Violations of the law, rules and regulations, or permits are punishable by a civil penalty of up to \$10,000 per day, to be assessed by a court. Willful violations are criminal, and are punishable by a \$25,000 fine and/or imprisonment. Wyoming will also seek to recover from any violator damages for any loss of fish, game, or birds caused by the violation.

WATER POLLUTION

Agency in charge:

Wyoming Oil and Gas Conservation
Commission
Office of State Oil and Gas
Supervisor
123 South Durbin
P.O. Box 2640
Casper, Wyoming 82602

Key laws or regulations:

Oil and Gas Conservation Commission
Rules and Regulations
Rule 326

Permits required:

Approval of supervisor; state
issued NPDES permit.

Discussion:

Rule 326 of the Oil and Gas Conservation Commission places a general prohibition on discharges of wastes to surface water, but allows the Supervisor discretion to approve of surface disposal methods when other methods are not feasible. The rule provides no standards or procedures for obtaining such approval.

Wyoming (cont.)

Chapter II, Section 16 of the Wyoming Department of Environmental Quality identifies the Oil and Gas Conservation Commission as the NPDES permitting authority for water discharges from oil production facilities. However, the Water Quality Division which administers the NPDES permit program for the state, also must approve any permit issued.

The permit application and review process is virtually identical to the EPA pattern described in Section 3.3.

Spills:

The Water Quality Division must be notified immediately if there is a spill of oil or hazardous substances, and a written report on the spill and clean-up activities must be submitted within 7 days.

The spiller must also take steps immediately to stop the spill and to clean up the spill. Chemicals may not be used in the clean up except in health emergencies or with prior approval.

Enforcement:

The Wyoming Law provides for both injunctions against violations and civil penalties of up to \$10,000 per day, plus assessment for any damages to state wildlife.

UNDERGROUND INJECTION

Agency in charge:

Wyoming Oil and Gas Conservation
Commission
Office of State Oil and Gas
Supervisor
123 South Durbin
P.O. Box 2640
Casper, Wyoming 82602

Wyoming (cont.)

Key laws or regulations: Oil and Gas Conservation Commission
Rules and Regulations
Rules 336, 401-405

Permits required: For underground disposal of water.
For EOR operations.

Permit application
procedure: Rules 401 to 405 cover enhanced
oil recovery projects. Injection
for EOR operations must be approved
by the full Commission. The appli-
cation (6 copies, \$25.00 fee) must
include:

- a plat showing the area invol-
ved, including all other wells
- a description of the operation
- identification of pools
- injection well logs
- a description of the casing
and case testing methods
- the type, source and amount of
the injection fluid.

The casing and cementing of the
well must prevent leakage and be
adequate to protect oil, gas, or
fresh water sources.

Most applications may be approved
administratively by the Supervisor,
without a hearing before the Commis-
sion. The rules on administrative
approval require the applicant to
send notice of application to the
land owners within one-half mile
from the injection well. Persons
so notified have 15 days to con-
test the application, and the
Supervisor has the discretion to
call a hearing on a contested appli-
cation.

The Supervisor must be notified of
commencement or abandonment of
operations, and the operator must
file regular reports on the type
and amount of material injected
and the injection pressures.

Wyoming (cont.)

Rule 336 for underground disposal of water is very similar in its requirements for both permit application forms and reporting.

HAZARDOUS WASTE

Agency in charge: Wyoming Department of Environmental Quality
Cheyenne, Wyoming 82002

Key laws or regulations: Department of Environmental Quality
Solid Waste Management Rules and Regulations Sections 11, 15.

Permit required: Yes.

Permit application procedure: New industrial and hazardous waste facilities must submit their facility plans to the Wyoming DEQ for approval. The plan must include the following information:

- map and plot plan
- construction schedule
- operating plan
- type and volume of waste to be handled
- geology
- soil analysis
- water protection plan
- fencing and other security
- fire protection plan.

The minimum standards for an approved industrial disposal facility are:

- fenced property
- no creation of a nuisance or hazard

Wyoming (cont.)

- no surface water flow onto, into, or out of the site
- at least 500 feet from the nearest stream or well
- leachate control system

Hazardous waste facilities must meet the following additional or more stringent requirements:

- exclusion of unauthorized persons from the site
- location away from flood plains, steep slopes, or similar areas of hazard
- location only in areas of low population density, low land use value, and low groundwater contamination potential.
- location on, or use of, impermeable soils
- plan to contain runoff from accidental spills
- use of impervious liners
- records on the types and amounts of waste
- total containment of wastes
- monitoring wells
- plans for proper closure of the facility.

Section 15 provides that any of the preceding requirements may be waived for facilities at remote sites.

Table A1-1. WATER AND SOLID WASTE PERMIT REQUIREMENTS

AGENCY	SURFACE WATER DISCHARGE PERMIT	UNDERGROUND INJECTION CONTROL		HAZARDOUS WASTE MANAGEMENT			TIME TO PROCESS (ALL PERMITS)
		PRODUCED WATER	WATER/CHEMICAL INJECTION (Production + Waste)	TEMPORARY STORAGE (< 90 days)	ON SITE DISPOSAL OR LONG-TERM STORAGE	OFF-SITE DISPOSAL	
U.S. EPA (Regional Office)	NPDES permit (only in states not administering NPDES program). New facilities - no discharge allowed.	Permit to be required under UIC program.	SAME	No permit; use of best management practices.	RCRA permit required.	No permit; record-keeping and reporting requirements.	6 months
California	NPDES	Permit required.	SAME		State permit required.	Delivery to licensed transporter.	2-3 months
Colorado	NPDES	Permit required.	SAME		Certificate of Designation		6 months
Illinois	No discharge allowed.	(Unified	permit)	Permit required for pits and lagoons.			1-3 months
Kansas	NPDES	Permit required.	SAME		Permit required.		1-3 months
Kentucky	State permit	(Certificate	of Compliance)		Permit required.		6 months

Table A1-1. WATER AND SOLID WASTE PERMIT REQUIREMENTS (cont.)

AGENCY	SURFACE WATER DISCHARGE PERMIT	UNDERGROUND INJECTION CONTROL		HAZARDOUS WASTE MANAGEMENT			TIME TO PROCESS (ALL PERMITS)
		PRODUCED WATER	WATER/CHEMICAL INJECTION (Production + Waste)	TEMPORARY STORAGE (< 90 days)	ON SITE DISPOSAL OR LONG-TERM STORAGE	OFF-SITE DISPOSAL	
Louisiana	No discharge to fresh water	Permit required.	Notification; no permit.		Permit required.	Similar to U.S. EPA.	1-6 months
New Mexico	Notice of intent to discharge (EPA issues NPDES permit)	Permit required.	SAME		Permit required.		3 months
Ohio	NPDES	Permit required.	SAME				6 months
Pennsylvania	NPDES; special rules on tanks, sumps, etc.	(Through	NPDES Permit)		Permit required.		6 months
Texas	Generally, no discharge of production wastes.	Permit required.	SAME				1 month
West Virginia	No discharge.	Permit required.	SAME				1-3 months
Wyoming	Generally, no discharge; exemption by Supervisor only.	Permit required.	SAME				2 months

Table A1-2. AIR EMISSION SOURCE PERMIT REQUIREMENTS

AGENCY	PRE-CONSTRUCTION PERMITS			OPERATING STANDARDS & PERMITS	PERMIT PROCESSING TIME	COMMENTS
	COMBUSTION SOURCE SIZE	STORAGE FACILITY SIZE	AIR QUALITY MONITORING REQUIREMENTS			
U.S. EPA Regional Office	New: Controlled emissions greater than 100/250 tons per year (tpy) of any pollutant. Modified: Net increase in emissions from 100/250 tpy source.	SAME SAME	1 year for all pollutants	Best Available Control Technology; New Source Performance Standards	3 - 12 months	Complex rules on applicability; standard of review; different permits for clean air and dirty air regions.
California	No statewide rule; coverage generally comprehensive Nonattainment areas: all sources emitting 50 lbs./day or more.	SAME	When no data available	Lowest achievable emission rates in nonattainment areas. Offsets usually required.	Varies with local district, complexity of application.	Exact rules vary from district to district; generally strict standards; ambient air quality problems widespread.
Colorado	Internal combustion $\geq$ 1000 h.p. Fuel-burning $\geq$ 0.5 MMBtu/hr. (All sources must file emissions notice.)			Notify state 30 days before start-up.	4-6 months	New air law enacted in June; regulations may change.
Illinois	Internal combustion $\geq$ 1500 h.p.	Illinois oil: $\geq$ 40,000 gallons Out of state oil: all storage.			3 months	
Kansas	Internal combustion: $\geq$ 1 lb./hr. TSP; or $\geq$ 2 lb./hr SO_x ; Fuel burning $\geq$ 0.35 -100 MMBtu/hr. (varies with fuel type)	>50 lbs./24 hrs. non-methane HC			2 months	State implementation plan behind schedule.
Kentucky	All new sources	All new sources.		May vary on case-by-case basis	2 months	

Table A1-2. AIR EMISSION SOURCE PERMIT REQUIREMENTS (cont.)

AGENCY	PRE-CONSTRUCTION PERMITS			OPERATING STANDARDS & PERMITS	PERMIT PROCESSING TIME	COMMENTS
	COMBUSTION SOURCE SIZE	STORAGE FACILITY SIZE	AIR QUALITY MONITORING REQUIREMENTS			
Louisiana	All new, modified, or relocated sources.	≥ 420,000 gals.	Air quality burden analysis	Compliance reports	1 month	All crude oil storage prior to custody transfer exempt from emission limits.
New Mexico	≥ 10 lbs./hr. or ≥ 25 tpy	SAME			2 months	
Ohio	Combustion: ≥ 1MMBtu/hr. heat input	≥ 500 gallons		Permit to operate if over 25 tpy emissions; ALL sources must register.	6 months	Consolidated permit procedure - one application for all permits.
Pennsylvania	> 2.5 MMBtu/hr.			Operating permit must be obtained after construction.	2 months	
Texas	Internal combustion ≥ 200 h.p.	≥ 2500 bbls.		Operating permit required.	2 months	
West Virginia	≥ 10 MMBtu/hr. Internal combustion engines exempt.				3 months	Automatic permit to construct if no actions within 90 days.
Wyoming	≥ 10 MMBtu/hr.		Large sources	Operating permit within 120 days of start-up	3 months	State administers EPA PSD program.

Table A1-3. PERMITTING TIME LINES FOR MAJOR SOURCES

(Notes: 1) Most facilities will not require all permits.

2) Times shown assume no appeals, lawsuits, or other extraordinary delays.)

AGENCY	NUMBER OF MONTHS BEFORE CONSTRUCTION BEGINS				AFTER CONSTRUCTION
	24 MONTHS	12 MONTHS	6 MONTHS	3 MONTHS OR LESS	
U.S. EPA	Initiate air quality monitoring (if necessary)	File complete PSD (air) permit application (consolidate with other applications where feasible).	File consolidated permit application - NPDES (water), UIC (injection control), RCRA (hazardous waste).		RCRA - permit to begin operation.
California	Initiate air quality monitoring (if necessary)		File state air permit application.	File NPDES, UIC, hazardous waste permit applications.	
Colorado			File state air permit application. File NPDES, UIC application.		
Illinois				File application for UIC. File state air permit application File application for pits and lagoons.	
Kansas				File applications for NPDES, UIC, waste disposal. File state air permit application.	
Kentucky			File NPDES application with U.S. EPA	File state air, water, and waste disposal applications.	
Louisiana			File application for UIC, hazardous waste. File NPDES application with U.S. EPA.	File state air permit application.	Notify state about chemical injection.

Table A1-3. PERMITTING TIME LINES FOR MAJOR SOURCES (cont.)

(Notes: 1) Most facilities will not require all permits.

2) Times shown assume no appeals, lawsuits, or other extraordinary delays.)

AGENCY	NUMBER OF MONTHS BEFORE CONSTRUCTION BEGINS				AFTER CONSTRUCTION
	24 MONTHS	12 MONTHS	6 MONTHS	3 MONTHS OR LESS	
New Mexico			File NPDES application with U.S. EPA.	File notice of intent to discharge; application for UIC. File state air permit application.	
Ohio			File consolidated application for all permits.		
Pennsylvania			File NPDES permit application (covers UIC also).	File waste disposal permit application.	Air operating permit.
Texas			File NPDES application with U.S. EPA.	File UIC permit application. File state air permit application.	Air operating permit.
West Virginia			File NPDES application with U.S. EPA.	File UIC permit application. File state air permit application.	
Wyoming	Initiate air quality monitoring (if necessary)		File PSD permit application.	File UIC permit application.	

APPENDIX 2

FEDERAL ENVIRONMENTAL STATUTES AFFECTING POLLUTION CONTROL REQUIREMENTS

Clean Air Act, 42 U.S.C. §§7401-7642

Clean Water Act, 33 U.S.C. §§1251-1376

Coastal Zone Management Act, 16 U.S.C.
§§1451-1464,

Endangered Species Act, 16 U.S.C. §§1531-
1543

National Environmental Policy Act, 42 U.S.C.
§§4321-4361

Noise Control Act, 42 U.S.C. §§4901-4918

Resource Conservation and Recovery Act,
42 U.S.C. §§6901-6987

Rivers and Harbors Act of 1899, 33 U.S.C.
§§401-466n

Safe Drinking Water Act, 42 U.S.C. §§300f-
300j-9

Toxic Substances Control Act, 15 U.S.C.
§§2601-2629

Figure A3-1

REGION I

John F. Kennedy Federal Bldg.
Room 2203
Boston, MA 02203
(617) 223-7210

REGION II

26 Federal Plaza
Room 1009
New York, New York 10007
(212) 264-2525

Region III

Curtis Building
6th & Walnut Streets
Philadelphia, PA 19106
(215) 597-9814

REGION IV

345 Courtland Street, N.E.
Atlanta, Georgia 30308
(404) 881-4727

REGION V

230 South Dearborn Street
Chicago, IL 60604
(312) 353-2000

REGION VI

First International Building
1201 Elm Street
Dallas, TX 75270
(214) 767-2600

REGION VII

1735 Baltimore Street
Kansas City, Missouri 64108
(816) 374-5493

REGION VIII

1860 Lincoln Street
Denver, Colorado 80203
(303) 837-3895

REGION IX

215 Fremont Street
San Francisco, CA 94105
(415) 556-2320

REGION X

1200 6th Avenue
Seattle, Washington 98101
(206) 442-1220

	STATE ENVIRONMENTAL	WATER QUALITY	WATER SUPPLY	INDUSTRIAL WASTE
CA	Huey Johnson Secretary for Resources The Resources Agency 1416 Ninth Street Sacramento, CA 95814 PHONE: 916-445-5656	Clint Whitney, Exec. Director Water Rights & Administration State Water Resources Control Board P.O. Box 100 Sacramento, CA 95801 PHONE: 916-445-3085 Larry Walker, Exec. Director Water Quality State Water Resources Control Board P.O. Box 100 Sacramento, CA 95801 PHONE: 916-445-1553	John M Gaston, Chief State Department of Health 2151 Berkeley Way Berkeley, CA 94704 PHONE: 415-843-7900 Ext. 413	Harry M. Schueller Supervising Water Resources Control Engineer Enforcement Section Legal Division Water Resources Control P.O. Box 100 Sacramento, CA 95801 PHONE: 916-445-7762
CO	Dr. Frank Traylor Executive Director Department of Health 4210 E. 11th Avenue Denver, CO 80220 PHONE: 303- 320-8333 X3315	Frank J. Rozich, Director Water Quality Control Div. Department of Health 4210 E. 11th Avenue Denver, CO 80220 PHONE: 303-320-8333 X3476	George Prince, Section Chief Water Quality Board Department of Health 4210 E. 11th Avenue Denver, CO 80220 PHONE: 303- 320-8333 X3453	Robert J. Shukle Industrial Waste Consultant Water Quality Division Department of Health 4210 E. 11th Avenue Denver, CO 80220 PHONE: 303-320-8333 X3480
IL	Michael Mauzy, Director IL Environmental Protection Agency 2200 Churchill Road Springfield, IL 62706 PHONE: 217-782-3397 FTS-956-3397	Michael Mauzy, Manager Environmental Programs Div. IL Environmental Protection 2200 Churchill Road Springfield, IL 62706 PHONE: 217-782-3397 FTS-956-3397	Ira Markwood, Manager Div. of Public Water Supply IL Environmental Protection 4500 South 6th Street Springfield, IL 62706 PHONE: 217-785-0252	Barbara Sidler, Sr. Tech. Advser Dir. of Enforcement Services IL Environmental Protection Agency 2200 Churchill Road Springfield, IL 62706 PHONE: 217-782-5544 FTS-956-5544
KS	Melville W. Gray, Director Division of Environment Dept. of Health & Environment Topeka, KS 66620 PHONE: 913-862-9360	Eugene Jensen, Director Bur. of Water Quality Division of Environment Dept. of Health & Environment Topeka, KS 66620 PHONE: 913-862-9360	N. Jack Burris Bur. of Public Water Supply Division of Environment Dept. of Health & Environment Topeka, KS 66620 PHONE: 913-862-9360	Eugene Jensen
KY	Dr. A. L. Roark Bureau of Environmental Protection KY Dept. for Natural Resources & Environmental Protection Capitol Plaza Towers Frankfort, KY 40601 PHONE: 502-564-3350 FTS-351-3350	Dr. Robert E. Blanz Director Division of Water Quality KY Dept. for Natural Resources and Environmental Protection Century Plaza - U.S. 127 South Frankfort, KY 40601 PHONE: 502-564-3410 FTS-351-3410	Nick G. Johnson, Director Div. of Sanitary Engineering KY Dept. for Natural Resources & Environmental Protection Century Plaza - U.S. 127 South Frankfort, KY 40601 PHONE: 502-564-3771 FTS-351-3771	Clyde P. Baldwin, P.E. Div. of Water Quality KY Dept. for Natural Resources & Environmental Protection Century Plaza - U.S. 127 S. Frankfort, KY 40601 PHONE: 502-564-3410 FTS-351-3410

Table A3-1

	STATE ENVIRONMENTAL	WATER QUALITY	WATER SUPPLY	INDUSTRIAL WASTE
LA	Dr. J. T. Hamrick, Actg. Assist. Secy. Office of Health Services & Environmental Quality Dept. of Health & Human Resources P.O. Box 60630 New Orleans, LA 70160 PHONE: 504-568-5050	Robert Lafleur, Exec. Sec. LA Stream Control Commission P.O. Drawer FC University Station Baton Rouge, LA 70893 PHONE: 504-342-6363	James F. Coerver, Director Bur. of Environmental Health LA Health & Human Resources Administration Division of Health P.O. Box 60630 New Orleans, LA 70160 PHONE: 504-568-5100	M. Garcia, Staff Engineer Permit Review Section Stream Control Commission P.O. Box Drawer FC University Station Baton Rouge, LA 70893 PHONE: 504-342-6363
NM	Thomas E. Baca, Director Environmental Improvement Agency P.O. Box 2348 Santa Fe, NM 87503 PHONE: 505-827-5271 Ext. 201 FTS: 8-476-5271	Joseph Pierce, Chief Water Quality Division Environmental Improvement Agency P.O. Box 2348 Santa Fe, NM 87503 PHONE: FTS-476-5271 505-827-5271 Ext. 232	Francisco Garcia, Chief Water Supply Section Environmental Improvement Agency P.O. Box 2348 Santa Fe, NM 87503 PHONE: FTS-476-5271 505-827-5271 Ext. 300	Michael Snavelly, Program Manager, Water Pollution Control, Surveillance & Stds. Sec. Environmental Improvement Agency P.O. Box 2348 Santa Fe, NM 87503 PHONE: FTS-476-5271 505-827-5271 Ext. 235
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Table A3-1 (cont.)

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Table A3-2

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Table A3-2 (cont.)

	AIR QUALITY	SOLID WASTE	NOISE	PESTICIDES
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Table A3-2 (cont.)

Table A4-1

GLOSSARY OF LEGAL AND ADMINISTRATIVE
TERMINOLOGY AND ABBREVIATIONS

Adjudicatory Hearing: A trial-type hearing held before an examiner or administrative judge or board at which the parties present testimony under oath and are generally allowed an opportunity for cross-examination.

Ambient Air Quality: The concentration of pollutants or contaminants in the general outdoor air except over the immediate confines of the facility. (See, National Ambient Air Quality Standards.)

BACT: Best Available Control Technology

BAT: Best Available Technology

Best Available Control Technology: Best Available Control Technology defines a level of control on air pollution emission that every new source subject to the PSD program must install on every emission point. There are no fixed numerical limits, but EPA has issued "guidelines" for evaluating BACT in each case. Cost of control is a factor. Compare with LAER.

Best Available Technology: Best Available Technology defines a level of water pollution control that every source must achieve in the period 1984-87. Numerical BAT discharge limits for many industries are set by regulation; where no such limit applies, BAT will be determined case-by-case. Economic considerations are a factor in setting BAT.

Best Practicable Technology: Best Practicable Technology defines a level of water pollution control that every source should have achieved by July 1, 1977. Any new source must at least meet the BPT standard. BPT is defined with reference to control technologies that are already available and proven.

BPT: Best Practicable Technology.

CAA: Clean Air Act.

C.F.R.: Code of Federal Regulations.

Table A4-1 (cont.)

- Civil Penalty: A penalty that may be imposed by an administrative agency or a court for violations of environmental laws or regulations. A civil penalty does not depend on any intentional wrongdoing; it is designed mostly to be an incentive for careful operation and to compensate the public for any environmental harm.
- Clean Air Act: The federal air pollution control law, enacted in its present form in 1970 and amended in 1977.
- Clean Water Act: The federal water pollution control law, originally known as the Federal Water Pollution Control Act (FWPCA), enacted in its present form in 1972 and amended in 1977 and 1978.
- Coastal Zone Management Act: The federal law under which the Great Lakes and maritime coastal states are encouraged to prepare comprehensive plans and procedures for regulating land use in the coastal zone, both onshore along the coast and in the near offshore area.
- Code of Federal Regulations: A compilation of all federal regulations now in force, updated annually. The code is organized by subject matter, most environmental regulations appear in Title 40; which now includes 5 separate volumes. References to the Code give the title first and the section number last, e.g., 40 C.F.R. §122.5.
- Corps (of Engineers): The U.S. Army Corps of Engineers. The Corps has jurisdiction and permit authority over any construction or dredging and filling affecting the waters of the United States. It administers the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Corps district offices are scattered throughout the country.
- Criminal Penalty: A penalty imposed by a court upon conviction for criminal violation of environmental laws or regulations. Criminal liability is generally restricted to cases of gross carelessness or intentional disregard of the law.
- CWA: Clean Water Act.
- Dredge and Fill: Any removal of material from, or depositing of material in any stream, lake, river or other water which requires a permit from the Corps of Engineers under Section 404 of the Clean Water Act.

Table A4-1 (cont.)

Effluent: This term generally refers to polluted water being released to the environment. Compare with "emission."

EIS: Environmental Impact Statement

Emission: Emission or emissions generally refer to release of air pollution into the environment. Compare with "effluent."

Environmental Impact Statement: The statement a federal agency must prepare under NEPA which describes the proposed action and its environmental effects, any alternatives to the proposed action, and irreversible or irretrievable commitments of natural resources. Some states have similar statements, which may or may not be called an EIS.

EPA: The U. S. Environmental Protection Agency. EPA has headquarters in Washington and ten regional offices (see list in Appendix 3) with substantial independent authority. EPA administers all the federal pollution control laws described in detail in this handbook, and also oversees administration of state programs to which it has delegated authority.

Fed. Reg.: Federal Register.

Federal Register: The Federal Register is a daily government publication that contains all final rules, proposed rules, notices, and other official documents issued by the federal agencies. All proposed rules, and recent final rules, can be found only in the Federal Register. Each year is a separate "volume," and the pages are numbered consecutively. Citations give the volume first and the page number last; e.g. 44 Fed. Reg. 39582.

Hazardous Substances: Any substance on an official EPA list of (at present) 299 substances. Any person that spills more than a specified quantity of a hazardous substance must report the spill immediately and pay for clean up.

Hazardous Waste: Any solid, semi-solid, or containerized waste material that EPA or a state agency defines as hazardous under RCRA or comparable state laws. Generally, flammable, corrosive, and toxic materials will be classified as hazardous.

Table A4-1 (cont.)

LAER: Lowest Achievable Emission Rate.

Lowest Achievable Emission Rate: The Lowest Achievable Emission Rate is the rate of emissions that any new source of air pollution must achieve if it locates in a nonattainment area. LAER is a stringent, technology-forcing standard. Control technologies from one industry may be applied to a source in another industry to define LAER. Costs are not a significant factor.

Major Source: Under the program for preconstruction review of air pollution sources, a major source is one that will emit more than 100 tons per year of any air pollutant. (If the source is not in one of 26 basic industrial categories, the cutoff becomes 250 tons per year.)

Modification: An addition to or change in a facility that will increase its rate of discharge or emission is a modification, and subject to most permit requirements. (See specific chapters for details.)

NA: Nonattainment.

NAAQS: See below.

National Ambient Air Quality Standards: These are minimum standards for acceptable air quality established by EPA under Section 110 of the Clean Air Act. See Chapter 2 for discussion of their purpose and legal effect.

National Emission Standards for Hazardous Air Pollutants: A special set of stringent emission limitations for those air pollutants (e.g., asbestos, mercury) which are toxic or carcinogenic or pose other serious risks.

National Environmental Policy Act: The federal law that requires federal agencies to prepare environmental impact statements before issuing permits, approving uses of federal lands, or undertaking projects and programs.

National Pollutant Discharge Elimination System: The official title of the Clean Water Act program for issuing permits for any discharge to surface water. The legal authority comes from Section 402 of the Clean Water Act.

Table A4-1 (cont.)

NEPA: National Environmental Policy Act.

NESHAPS: National Emission Standards for Hazardous Air Pollutants.

New Source: A completely new source of pollution, or an existing source that undergoes substantial modification and reconstruction. Permit requirements and limitations on discharges of pollutants are usually stricter for new sources than they are for existing sources.

New Source Performance Standards: Strict limits which EPA establishes for air emissions from new sources in specific industrial categories, e.g., fossil-fuel fired steam generators. A similar set of standards is established for water pollution dischargers, but has no common name.

Nonattainment: Describes a condition where the air quality is worse than (does not attain) the NAAQS.

Nonattainment Area: A defined geographical area in which the ambient air quality is worse than the NAAQS. This determination is made for each pollutant separately. Opposite of PSD area.

NPDES: National Pollutant Discharge Elimination System.

NPDES Permit: A permit for a discharge to surface water issued by EPA or by a state to which EPA has formally delegated federal permit authority. A state permit from a state without an EPA-approved program is not an NPDES permit. Every discharge requires an NPDES permit.

NSPS: New Source Performance Standards.

Prevention of Significant Deterioration: A program under sections 165-169A of the Clean Air Act to protect the air quality of regions where existing air quality is better than required by the National Ambient Air Quality Standards.

PSD: Prevention of Significant Deterioration.

PSD Area: A defined geographical area in which the ambient air quality is better than the NAAQS. This determination is made for each pollutant separately. Opposite of nonattainment area.

PSD Permit: A permit which a facility owner/operator must obtain from EPA or an EPA approved state agency before beginning construction of a "major" new source or a "modification" to a major source of air pollution if the source is located in a PSD area for any pollutant.

Public Hearing: The term public hearing almost always refers to an informal hearing where the agency listens to statements by an interested person. The agency staff at the hearing may direct questions to the speakers, but the speakers are not under oath and are not obligated to answer. Compare with adjudicatory hearing.

RCRA: Resource Conservation and Recovery Act.

Regional Administrator: The head of one of EPA's ten regional offices.

Resource Conservation and Recovery Act: The federal solid waste management law, passed in 1976, that places special emphasis on the generation, transport, and disposal of hazardous waste.

Safe Drinking Water Act: The federal law that sets quality standards for public water supplies and authorizes the underground injection control program to protect aquifers from contamination by underground drilling and injection.

SDWA: Safe Drinking Water Act.

SIP: State Implementation Plan.

State Implementation Plan: A plan for the control of air pollution which each state must develop and submit to EPA for approval. The plan must be strict enough to assure that the National Ambient Air Quality Standards will be quickly attained and maintained.

Toxic Substance or

Toxic Effluent: The term toxic has slightly different meanings depending on the context. Under the Clean Water Act, a toxic substance is one of a list of 65 generic classes (over 200 discrete compounds) for which EPA will, sooner or later, set very strict limits on discharges and spill prevention. Under the Toxic Substances Control Act, a toxic substance is any compound that EPA determines should be regulated under that law, especially newly invented compounds. A toxic compound is usually (but not necessarily) also classified as a hazardous substance under the Clean Water Act or RCRA.

Table A4-1 (cont.)

UIC: Underground Injection Control.

Underground Injection Control: The title of EPA's proposed program to protect underground drinking water supplies by setting siting, construction, and operating conditions on drilling injection wells and injecting any material underground.

U.S.C.: An abbreviation used in legal citations, standing for United States Code. The United States Code is a compilation of federal laws arranged by subject matter. For example, Title 33 covers water pollution control. Citations give the title first and the section number of the specific law last; e.g., 33 U.S.C. §1353(a). Recent statutes may also be cited by their Public Law number (a chronological sequence of federal laws), e.g., Pub. L. No. 92-500 (the 500th law of the 92nd Congress), and old and new laws are sometimes also cited to the volume and page of Statute at Large, an annual compendium of Congressional laws, e.g., 89 Stat. 1473.

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