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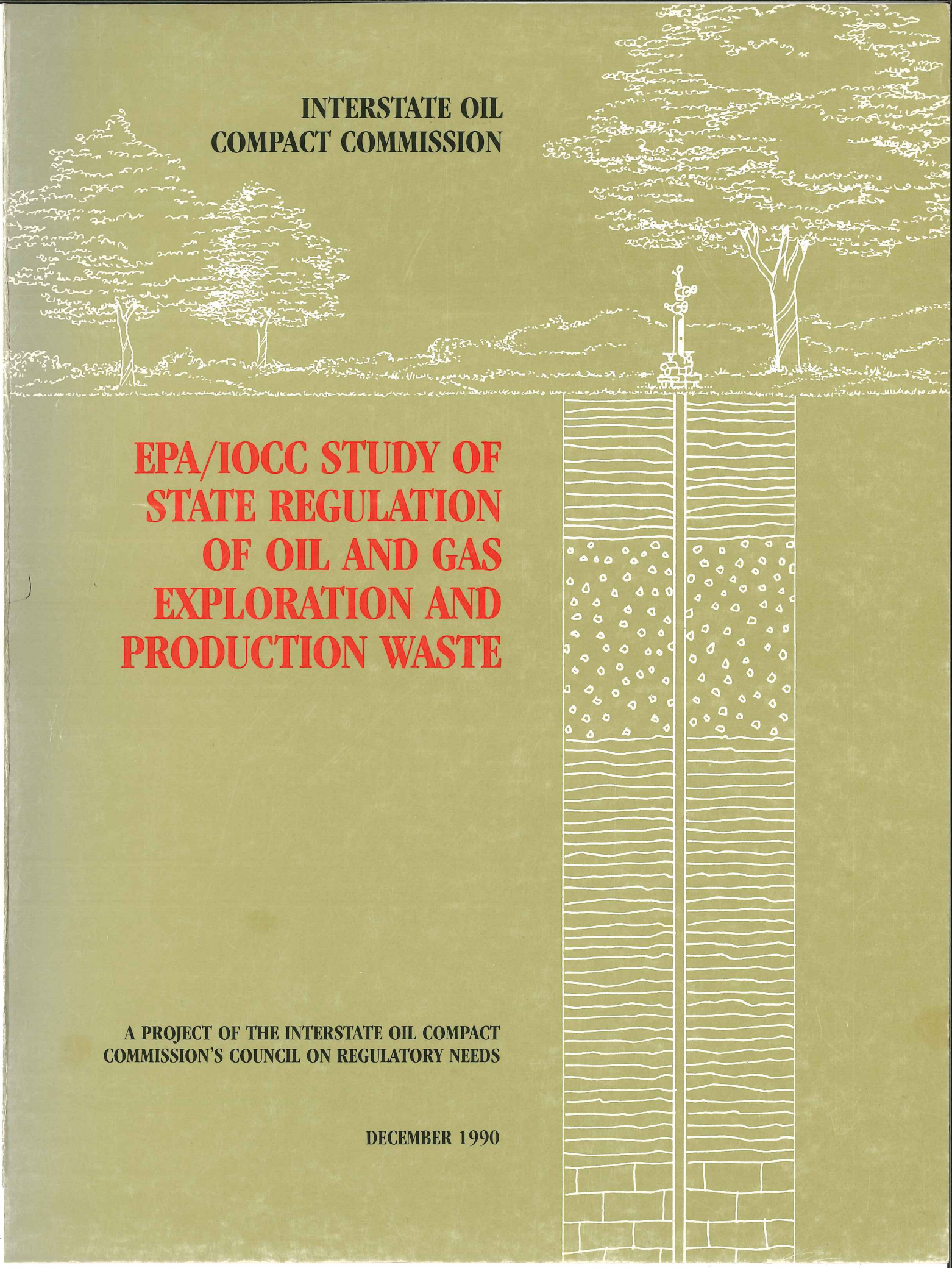

EPA/IOCC STUDY OF STATE REGULATION OF OIL AND GAS EXPLORATION AND PRODUCTION WASTE

A PROJECT OF THE INTERSTATE OIL COMPACT COMMISSION'S COUNCIL ON REGULATORY NEEDS

DECEMBER 1990

EPA/IOCC PROJECT ON STATE REGULATION OF OIL AND GAS EXPLORATION AND PRODUCTION WASTE

December 1990

INTERSTATE OIL COMPACT COMMISSION

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FOREWORD

For 55 years, the Interstate Oil Compact Commission's (IOCC) purpose has been to promote and encourage the conservation of oil and gas through established state agencies. Currently representing 35 states (29 members and six associates) the IOCC member states are the guardians of this nation's oil and gas resources.

Representing the governors and state agencies charged with regulating the oil and gas industry, the IOCC's involvement in environmental concerns with respect to exploration and production (E&P) waste management is an essential element in the IOCC's continuing role in sound conservation and production practices by the states.

This report represents the IOCC Council on Regulatory Needs' two-year project to provide the states and the Environmental Protection Agency (EPA) with a report recommending the elements necessary for an effective state regulatory program.

From the beginning of this project, the IOCC has agreed with EPA's Regulatory Determination that . . . "Existing state and federal regulatory programs are generally adequate . . ." and entered this project to support the process of regulation and enforcement through programs at the state level and consider possible improvements in regulation of E&P wastes.

By their participation, the IOCC representatives on the Council accepted the charge to work in good faith with Council members, the Advisory Panel, and Observers to reach a consensus on as many issues as possible. Throughout the development of this report, state regulatory personnel have agreed to accept, in some cases, much more stringent regulatory approaches than are currently in place in their state. This commitment to work with all interest groups, to improve state regulatory programs for better protection of human health, and the environment must be recognized and supported by the individual states, federal government, environmental/public interest groups and the industry.

The IOCC supports the recommendations of this report, with the following clarifications: 1) Pit closure times should be left to the respective states which may extend the closure of a pit beyond 12 months if good cause can be demonstrated (5.3.6 and 4.2.6); 2) A permit to drill shall serve as adequate record keeping for the location of all pits within 200 feet of the well location (5.3.6f); 3) The IOCC will not become involved in state and federal UIC programs but recognizes the EPA's Midcourse Review as a valuable state and federal cooperative effort of program review (recommendation for future work, number 4, Section 6).

The IOCC member states accept this report. The IOCC member states also accept the Council's implementation strategy and recommendations for future work and appreciate the opportunity to work with the EPA for improved environmental protection.

As Chairman of the IOCC, I would like to express my appreciation to the EPA for the financial support of this effort and to thank the Council Co-chairmen, Governor George A. Sinner of North Dakota and Governor Garrey Carruthers of New Mexico, for their interest in making this a successful project. I would also like to thank the Council members, advisors, and observers for all of the time and energy they have put into this project

Mike Sullivan
GOVERNOR
WYOMING

INTRODUCTION

In EPA's June 1988 Regulatory Determination for exploration and production (E&P) waste, it was reported EPA would . . . "work with states to encourage improvements in the state's regulations and enforcement of existing programs . . .". To assist the EPA in this effort, the IOCC established the Council on Regulatory Needs and applied for and received a grant from EPA in support of this effort. The purpose of the IOCC project was to create a forum in which representatives of state oil and gas agencies, state environmental agencies, environmental groups, industry representatives and federal agencies could work together to recommend effective state-level management of E&P waste and assist the states where improvement is necessary. This report represents the Council's recommendations for the administrative and technical aspects of an effective state regulatory program. As a first effort, it must be recognized future work and revisions will be necessary. Having only 18 months of real work time on this project, the quality of information in this report is a credit to all that have participated.

The need for an economically viable domestic oil and gas industry while protecting human health and the environment should be the goal of state and federal governments, industry and environmental/public interest groups. As Council Co-chairmen, these were the goals under which we expected the Council to work.

While this report may not represent a complete consensus view of the participants, due to some basic philosophical differences, the importance of this diverse group working together on these issues cannot be under estimated. Those involved are to be congratulated on a job well done and have shown their interest in E&P environmental issues and a willingness to work toward improvement for the benefit of all.

We would like to thank the EPA for its financial support and cannot over emphasize our appreciation to the participants.

We urge the continued support of the IOCC membership, federal government, industry and environmental organizations in addressing E&P environmental issues.

Finally, we believe the report's implementation strategy and recommended future work sections must be accepted and acted upon by all interested groups.

George A. Sinner
GOVERNOR
NORTH DAKOTA

Garrey Carruthers
GOVERNOR
NEW MEXICO

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DEDICATION

This report is dedicated to Mr. Gene A. Christianson of North Dakota, an original member of the Council who died suddenly in February 1989, and to all devoted state employees whose efforts and loyalty benefit every citizen.

SECTION 1

INTRODUCTION

1.1 Background

The Interstate Oil Compact Commission (IOCC) is the organization of the governors of the 29 oil and gas producing states. The IOCC has been assisting states in developing their oil and gas regulatory programs since 1935. More than 99 percent of the oil and gas produced in the United States onshore is produced within the borders of and is regulated by member states of the IOCC. In recent years, with the creation of an environmental affairs committee, the IOCC has become increasingly involved in environmental issues related to oil and gas production.

1.2 EPA's Regulatory Determination for E&P Wastes

The federal government's increasing interest in environmental and potential human health impacts associated with exploration and production of crude oil and natural gas arose from a two-year study of exploration and production (E&P) wastes and their associated waste management practices by the U.S. Environmental Protection Agency (EPA) in 1986 and 1987. The results of that study were documented in a December 1987 Report to Congress (EPA 1987), which was required by 1980 amendments to the federal Resource Conservation and Recovery Act (RCRA). Based on the findings of the Report to Congress and on oral and written comments received during public hearings in the spring of 1988, EPA on June 30, 1988, decided not to recommend federal regulation of E&P wastes as hazardous wastes under Subtitle C of RCRA (EPA 1988). The Agency gave the following reasons for its determination:

a. "Subtitle C does not provide sufficient flexibility to consider costs and avoid the serious economic impacts that regulation would create for the industry's exploration and production operations;

b. "Existing state and federal regulatory programs are generally adequate for controlling oil, gas and geothermal wastes. Regulatory gaps in the Clean Water Act and UIC [Underground Injection Control] program are already being addressed, and the remaining gaps in state and federal regulatory programs can be effectively addressed by formulating requirements under Subtitle D of RCRA and by working with the States;

c. "Permitting delays would hinder new facilities, disrupting the search for new oil and gas deposits;

d. "Subtitle C regulation of these wastes could severely strain existing Subtitle C facility capacity;

e. "It is impractical and inefficient to implement Subtitle C for all or some of these wastes because of the disruption and, in some cases, duplication of state authorities that administer programs through organizational structures tailored to the oil and gas industry; and

f. "It is impractical and inefficient to implement Subtitle C for all or some of these wastes because of the permitting burden that the regulatory agencies would incur if even a small percentage of these sites were considered Treatment, Storage and Disposal Facilities (TSDFs)." (53 Federal Register 25456, July 6, 1988).

In the determination, EPA found that "existing state and federal regulations are generally adequate . . . Certain regulatory gaps do exist and enforcement of existing regulation in some states is inadequate." To address those concerns, EPA announced a three-pronged approach that consists of:

- "Improving federal programs under existing statutory authorities in RCRA Subtitle D, the Clean Water Act, and the Safe Drinking Water Act;

- "Working with states to encourage improvements in the states' regulations and enforcement of existing programs, and

- "Working with Congress to develop any additional statutory authority that may be required."

1.3 IOCC's Council on Regulatory Needs

IOCC formed a Council on Regulatory Needs in January 1989 to assist EPA with the second prong of the agency's approach for E&P wastes. Funded by a two-year, $300,000 grant from EPA, the Council is comprised of 12 state regulatory agency members. The Council is supported in its efforts by a nine member advisory committee, of whom three represent state regulatory agencies, three represent industry, and three represent public-interest/environmental groups. The Council is assisted by five representatives of EPA, two from the U.S. Department of Energy, and two from industry, who act as official observers. Governors George Sinner of North Dakota and Garrey Carruthers of New Mexico are co-chairs of the Council.

In 1989, the Council met in February, June and December. An organizational meeting of the Council was held in February, 1989 in Denver, Colorado. At that meeting, a committee structure was formed with the Technical Committee consisting of three subcommittees; Pits, Land, and Commercial, and the Administrative Committee consisting of four subcommittees; Personnel and Resources, Organization and Coordination, Statutory Authority, and State and Federal Relations. At the Council meeting in June, 1989, in Reno, Nevada, the Technical Subcommittees submitted initial criteria for discussion by the full Council. The Administrative Committees presented their first draft reports to the Council at its meeting in Tulsa, Oklahoma in December 1989.

In early 1990, the separate committee reports were revised and combined into a single document. This document was presented as a draft final report at the June, 1990 IOCC meeting in Bismarck, North Dakota. During the summer of 1990, the draft report was circulated to over 300 interested parties for review and comment.[1] In August, 1990, final changes were made to the document so that the Council could present its final report at the December, 1990 IOCC meeting in Phoenix, Arizona.

The purpose of the Council is to recommend effective regulations, guidelines, and/or standards for state-level management of oil and gas production wastes (IOCC 1989). EPA has concurred in this purpose, stating that " . . . IOCC is leading an effort . . . that will use . . . information gathered by EPA to develop IOCC guidelines for state oil and gas waste management regulations" (Lowrance 1989). The technical and administrative criteria proffered by the Council on Regulatory Needs will be published and disseminated to the states as examples of the range of "elements" necessary for effective state regulatory programs for E&P wastes. The criteria by themselves are not intended to form the sole basis of any future federal statutory or regulatory authorities that may be sought by EPA for oil and gas production wastes.

1.4 Implementation Strategy

a. This report represents IOCC's initial effort to help the states and EPA improve E&P waste management programs. This report:

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[1] *Mail list and comments are available upon request.*

- Demonstrates the commitment of the governors of oil and gas producing states, EPA, state agencies, environmental groups and industry to work together for environmental change and improvements;

- Serves as a model for future efforts and substantiates IOCC's position as an appropriate forum to develop comprehensive approaches to multifaceted and complex oil and gas related environmental issues; and

- Establishes a baseline of performance that can be used for both the administrative and technical aspects of E&P waste management. This baseline is useful to federal and state regulators, legislators, and oil and gas operators.

b. To achieve successful implementation, the Council recommends the following strategy:

- Secure grants and encourage individual states to provide adequate funding for implementation of followup recommendations and continued active participation of all affected parties.

- Communicate the criteria of this report to EPA, state agencies, operators, and other interested parties through direct contact, at E&P waste management conferences and symposia, in a series of one-day workshops hosted by state agencies and involving regional EPA offices, state and tribal agencies, oil and gas operators, trade associations, environmental groups, and through other mechanisms as may be appropriate.

- Continue to build consensus and improve this document. To this end, IOCC plans to widely circulate it to federal agencies (EPA, DOE, DOI), state oil and gas agencies, state environmental agencies, national and regional trade associations, and other interested parties seeking endorsement or qualified endorsement. The Council further recommends updating this document every three years. The Council also recommends updates include status reports from participating states that address, (1) progress of the states in using and implementing the report's criteria, and (2) any unresolved or new issues.

- Use this document as a basis for conducting IOCC coordinated reviews of state E&P waste management programs and as a basis for review of federal agency programs. Teams of senior state regulatory personnel should visit agencies and review programs using this document as a baseline of performance and for making recommendations for improvement.

- Use IOCC as a clearinghouse for changes and revisions to state and federal regulatory and legislative programs.

- Pursue improvements in data management, waste characterization, and other areas identified in Section 6 of this report.

1.5 Summary of State Programs

As part of the Council's effort, a review of state E&P wastes programs was undertaken. A questionnaire was developed and sent to all oil and gas producing states. The state program summaries contained in Appendix B to these criteria were based on responses to that questionnaire, and on information contained in Appendix 3 of the EPA Report to Congress, and IOCC's Summary of State Regulations. The states provided updated information for the reprint of EPA's Appendix 3. The summaries are presented in alphabetical order.

SECTION 2

SCOPE OF THE CRITERIA

2.1 General

a. IOCC criteria address waste management practices that are unique to E&P operations and wastes that were determined by EPA to be exempt from the hazardous waste management requirements of Subtitle C of RCRA. These narrowly defined wastes include drilling muds and cuttings, produced water and associated waste. Wastes that are uniformly regulated by RCRA hazardous waste management requirements as well as general industrial wastes such as solvents, off-specification chemicals, commercial products, household wastes and office refuse are not addressed by these criteria.

b. These criteria do not address disposal of produced water by injection or surface discharge -- waste management practices that are regulated by EPA or by the states under authority of the federal Safe Drinking Water Act and federal Clean Water Act, respectively.[1] Brief descriptions of the regulatory frameworks authorized by those laws follow in Section 2.2 and 2.3. Disposal of produced water in pits, by land application or at commercial disposal facilities is addressed in the technical criteria of Sections 5.

c. In addition to a review of provisions of the Safe Drinking Water and Clean Water Acts that are applicable to E&P wastes, this section also contains definitions of solid wastes and hazardous wastes, reviews EPA's waste mixture rule, lists examples of exempt and nonexempt E&P wastes, and describes general requirements for the management of nonexempt wastes.

2.2 Class II Injection Wells

The Safe Drinking Water Act establishes a special class (Class II) of injection wells used for the disposition of oil-field fluids. Injection wells in this class are used for E&P waste disposal, enhanced oil recovery and, in some cases, storage of liquid hydrocarbons. Class II underground injection control (UIC) programs are administered directly by the states through primacy delegated by EPA or by EPA in states that have not sought or obtained primacy for the UIC program. Some states have negotiated primacy agreements with EPA and in return have received authorization and federal funding for program implementation conditional upon meeting minimum EPA standards. Primacy agreements, which may be amended with approval from the EPA, largely dictate what can be injected in Class II wells. The EPA determines which wastes can be injected in Class II wells in nonprimacy states.

Among the minimum requirements for Class II wells are:

a. Only approved E&P wastes may be injected.

b. No well may endanger an Underground Source of Drinking Water (USDW).

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[1]*Nearly 21 billion barrels of produced water -- or 98 percent of all E&P wastes -- were generated in the U.S. in 1985, according to American Petroleum Institute (API) figures cited by EPA (EPA 1987). Most of that produced water was disposed by injection, with much smaller volumes discharged to surface waters or disposed in pits, by land application or at commercial disposal facilities. Drilling wastes (i.e., drilling fluids and cuttings) accounted for about two percent of all E&P wastes generated in 1985, totaling 361 million barrels, according to API (EPA 1987).*

c. Unless permitted by rule, all wells must be permitted before construction.

d. All wells must demonstrate mechanical integrity at least once every five years.

EPA conducted a comprehensive review of the UIC program in 1989. IOCC will review EPA's final recommendations for possible future inclusion in its waste disposal criteria.

2.3 NPDES-Permitted Discharges

All point-source discharges of pollutants to surface waters of the United States must comply with the requirements of permits issued under the National Pollutant Discharge Elimination System (NPDES). The NPDES program is administered by EPA under the authority of the federal Clean Water Act or by the states through programs delegated by EPA. NPDES permits establish effluent limitations and monitoring requirements for discharges. Effluent limits are based upon the more stringent of levels which can be achieved through the use of available technology and levels necessary to meet EPA-approved state water quality standards. The Clean Water Act requires NPDES permits for E&P waste discharges to surface water. Currently effluent guidelines prevent any discharge to surface waters except in the following categories:

a. Discharges to coastal areas containing brackish waters not suitable for human use;

b. Discharges of low salinity produced waters which are of beneficial use in arid regions west of the 98th meridian; and

c. Discharges from stripper oil wells.

2.4 Definition of Solid Waste

a. In simplest terms, a solid waste is any material that is discarded or intended to be discarded. According to RCRA, solid wastes may be solid, semi-solid, liquid, or contained gaseous material. Commercial products are not wastes unless and until they are discarded. Commercial products and their releases are regulated under other statutes such as the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Toxic Substances Control Act (TSCA), Superfund Amendments and Reauthorization Act (SARA), and the Occupational Safety and Health Act (OSHA).

b. EPA has also determined that produced water injected for enhanced recovery[2] is not a waste for purposes of RCRA Subtitle C or D, since produced water used in enhanced recovery is beneficially recycled and is an integral part of some crude oil and natural gas production processes.

2.5 Hazardous Waste

Under RCRA, a solid waste may be designated as hazardous waste if it is specifically listed as a hazardous waste or if it exhibits one or more of the characteristics of hazardous wastes. (See 40 CFR 261).

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[2]*Enhanced recovery describes all efforts to increase ultimate production of oil and gas from a reservoir, and this terminology will be considered to encompass other nomenclature in common usage such as pressure maintenance, secondary recovery, and tertiary recovery. All enhanced recovery techniques include methods for supplementing natural reservoir forces and energy, or otherwise increasing ultimate recovery. Such techniques include water injection, gas injection, gas cycling, and miscible chemicals and thermal processes.*

2.5.1 Listed Hazardous Waste

a. EPA has listed numerous types or classes of solid wastes as hazardous waste because they typically exhibit one or more of the characteristics of hazardous waste, or have been shown to exceed certain human toxicity criteria, or contain any one of more than 350 chemical compounds or substances that are listed as hazardous constituents. (40 CFR 261 App VIII.)

b. EPA's regulations contain four lists of hazardous wastes: (1) hazardous waste from nonspecific sources, (2) hazardous waste from specific sources, (3) commercial chemical products that become acutely hazardous waste when disposed, and (4) commercial chemical products that become toxic wastes when disposed.

2.5.2 Characteristically Hazardous Waste

a. EPA considers any waste to be a hazardous waste if it exhibits any one of the characteristics of ignitability, corrosivity, reactivity, or toxicity.

b. EPA has expanded the toxicity category (toxicity characteristic (TC)), and adopted a revised laboratory procedure (toxicity characteristic leaching procedure (TCLP)).

2.6 EPA's Mixture Rule

EPA's RCRA regulations provide that the commingling of any listed hazardous waste with a nonhazardous waste renders the entire mixture a hazardous waste. The intent of this mixture rule is to prevent avoidance of hazardous waste regulations through dilution. For example, discarding a listed hazardous waste (e.g., a half-empty container of a listed solvent) in a reserve pit would cause the otherwise exempt pit contents to become a hazardous waste and result in the expensive closing of the reserve pit under RCRA hazardous waste regulations. Also, unused commercial products should not be disposed with oil-field wastes. All reasonable efforts should be made to completely use commercial products, return them to their vendor if they are not fully used, or segregate them from other wastes for management and disposal.

2.7 EPA's List of Exempt Exploration and Production Wastes

EPA's determination found that the following wastes are exempt from RCRA hazardous waste management requirements. The list below identifies many but not all exempt wastes. In general, E&P exempt wastes are generated in "primary field operations", and not as a result of maintenance or transportation activities. (53 FR 25453-25454)

- "Produced water
- "Drilling fluids
- "Drill Cuttings
- "Rigwash
- "Drilling fluids and cuttings from offshore operations disposed of onshore
- "Well completion, treatment, and stimulation fluids
- "Basic sediment and water and other tank bottoms from storage facilities that hold product and exempt waste

- "Accumulated materials such as hydrocarbons, solids, sand, and emulsion from production separators, fluid treating vessels, and production impoundments
- "Pit sludges and contaminated bottoms from storage or disposal of exempt wastes
- "Workover wastes
- "Gas plant dehydration wastes, including glycol-based compounds, glycol filters, filter media, backwash, and molecular sieves
- "Gas plant sweetening wastes for sulfur removal, including amine, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge
- "Cooling tower blowdown
- "Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste stream)
- "Packing fluids
- "Produced sand
- "Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation
- "Hydrocarbon-bearing soil
- "Pigging wastes from gathering lines
- "Wastes from subsurface gas storage and retrieval, except for the listed nonexempt wastes
- "Constituents removed from produced water before it is injected or otherwise disposed of
- "Liquid hydrocarbons removed from the production stream but not from oil refining
- "Gases removed from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons
- "Materials ejected from a producing well during the process known as blowdown
- "Waste crude oil from primary field operations and production and
- "Light organics volatilized from exempt wastes in reserve pits or impoundments or production equipment."

2.8 EPA's List of Nonexempt Exploration and Production Wastes

EPA's regulatory determination (53 FR 25453-25454) for exploration and production wastes listed the following wastes as nonexempt. The list below identifies many but not all nonexempt wastes. Many of these wastes are generated during maintenance of production equipment as well as transportation (pipeline and trucking) activities. While the following wastes are nonexempt, their regulatory status as "hazardous wastes" is dependent upon a determination of their characteristics or whether they are listed as hazardous waste. Nonexempt wastes should be managed as described under Section 2.9.

- "Unused fracturing fluids or acids
- "Gas plant cooling tower cleaning wastes
- "Painting wastes
- "Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- "Vacuum truck and drum rinsate from trucks and drums transporting or containing nonexempt waste
- "Refinery wastes
- "Liquid and solid wastes generated by crude oil and tank bottom reclaimers
- "Used equipment lubrication oils
- "Waste compressor oil, filters, and blowdown
- "Used hydraulic fluids
- "Waste solvents
- "Waste in transportation pipeline-related pits
- "Caustic or acid cleaners
- "Boiler cleaning wastes
- "Boiler refractory bricks
- "Incinerator ash
- "Laboratory wastes
- "Sanitary wastes
- "Pesticide wastes
- "Radioactive tracer wastes
- "Drums, insulation, and miscellaneous solids"

EPA did not specifically address in its regulatory determination the status of several waste streams including hydrocarbon-bearing material that is recycled or reclaimed by reinjection into a crude stream. However, under existing EPA regulations, recycled oil, even if it were otherwise hazardous, could be reintroduced into the crude stream, if it is from normal operations and is to be refined along with normal process streams at a petroleum refinery facility. See 40 CFR §261.6 (a)(3)(vi).

2.9 Requirements for Nonexempt Wastes

a. EPA's hazardous waste regulations, including the toxicity characteristic (TC), may apply to nonexempt waste generators at E&P sites.

b. Nonexempt wastes should be tested whenever there is reason to believe they may exhibit one or more of the hazardous waste characteristics. Although there is no requirement that a nonexempt waste be tested to determine if it is hazardous, civil and criminal penalties may be imposed if the waste is not managed in a safe manner, and according to regulations.

c. Depending on actual hazardous waste volume generated, stored or managed onsite, RCRA hazardous waste requirements for treatment, storage, or disposal or corrective action may apply.

d. Nonexempt waste should also be segregated whenever possible from exempt waste. If the nonexempt waste were a listed hazardous waste, EPA's mixture rule would make the entire commingled waste stream subject to stringent RCRA Subtitle C requirements, including the requirement that the waste be disposed at a hazardous waste facility. When segregation is not practical, the nonexempt waste should be examined closely to assure that it is not a hazardous waste.

e. Some states have adopted hazardous waste regulations which differ from those that EPA has promulgated. While different in many specific areas, those state programs, by law, still must be at least as stringent as the federal programs.

SECTION 3

GENERAL CRITERIA

3.1 General

An effective program for the regulation of E&P wastes should include, at a minimum:

a. statutory authority which adequately details the powers and duties of the regulatory body;

b. statutory authority to promulgate appropriate rules and regulations;

c. statutes and implementing regulations which adequately define necessary terminology;

d. provisions to adequately fund and staff the program;

e. mechanisms for coordination among the public, government agencies and regulated industry; and

f. technical criteria for E&P waste management practices.

3.2 Goals

An effective state program should contain a clear statement of the program's goals and objectives. Such goals should include, at a minimum, protecting human health and the environment from the mismanagement of E&P wastes while maintaining an economically viable oil and gas industry and encouraging waste minimization as a means of achieving such a goal.

3.3 State/Regional Variations in Criteria

These criteria are intended to provide guidance to the states in the formulation, development and evaluation of oil and gas environmental regulatory programs. Fundamental differences exist from state to state, and within regions within a state, in terms of climate, hydrology, geology, economics and method of operation which may impact on the manner in which oil and gas exploration, development and production is performed. State oil and gas programs can, and should, vary from state to state and within portions of a state.

The process by which these criteria are incorporated into state programs is a function of and within the discretion of the responsible state agency. It is recognized that state programs must vary in order to accommodate differences in climate, hydrology, geology, economics, and method of operation or to accommodate individual differences in state administrative procedures or law. Furthermore, in some instances, in order to accommodate regional, areal, or individual differences within a state, it is appropriate for site-specific waivers or variances to be allowed for good cause shown. All such variations should be consistent with the goals of Section 3.2.

SECTION 4
ADMINISTRATIVE CRITERIA

4.1 Basic Requirements

Various federal regulations applicable to the delegation to states of federal environmental programs provided the Council with a useful framework for the development of criteria for an effective state program. Such a program for E&P waste should, at a minimum, include provisions for permitting, compliance evaluation, and enforcement.

4.1.1 Permitting

A state must have a regulatory mechanism to assure that wastes generated during oil and gas E&P operations are managed in an environmentally responsible manner. A program to achieve that objective may rely on one or more mechanisms, including issuance of individual permits, issuance of permits by rule, establishment of regulatory requirements by rule, issuance of general permits, registration of facilities, and/or notification of certain activities undertaken pursuant to general regulations. The regulating state agencies should have authority to refuse to issue or reissue permits or authorizations if the applicant has outstanding, finally determined violations or unpaid penalties, or if a history of past violations demonstrates the applicant's unwillingness or inability to comply with permit requirements. Individual permits for specific facilities or operations should be issued for fixed terms. In the case of commercial or centralized facilities, permits generally should be reviewed, and revised if necessary, no less frequently than every five years. Where similar requirements are mandated by two or more regulatory programs, those requirements should be combined where feasible. The process for obtaining permits should also involve prompt consideration and response to permit applications, while preserving the integrity of the permit review process, including appropriate public participation.

4.1.2 Compliance Evaluation

4.1.2.1

State programs generally should contain the following compliance evaluation capabilities:

a. Procedures for the receipt, evaluation, retention, and investigation for possible enforcement action of all notices and reports required of permittees and other regulated persons. Investigation for possible enforcement action should include determination of failure to submit these notices and reports.

b. Inspection and surveillance procedures that are independent of information supplied by regulated persons to determine compliance with program requirements, including:

(1) the capability to make comprehensive surveys of facilities and activities subject to regulation in order to identify a failure to comply with program requirements by responsible parties;

(2) the capability to conduct periodic inspections of regulated facilities and activities at a frequency that is commensurate with the risk to the environment that is presented by each facility or activity; and

(3) the authority to investigate information obtained regarding violations of applicable program and permit requirements.

c. Procedures to receive and assure proper consideration of information submitted by the public about alleged violations and for encouraging the public to report perceived violations. Such procedures should not only involve communications with the public to apprise it of the process to be followed in filing reports or complaints, but also how the state agency will assure an appropriate and timely response.

d. Authority to enter any regulated site or premises where E&P activities are being conducted and locations in which records relevant to program operation are kept in order to inspect, monitor, copy records or otherwise investigate compliance with permit conditions and other program requirements.

e. Investigatory procedures that will produce an appropriate paper trail in support of evidence admissible in an enforcement proceeding.

4.1.2.2

An effective state program should provide that a state permit does not relieve the operator of the obligation to comply with federal, local or other state permits or regulatory requirements.

4.1.3 Enforcement

4.1.3.1

With respect to violations of the state program, the state agency should have the authority to take some or all of the following enforcement actions[1]:

a. Issue a notice of violation with a compliance schedule;

b. Restrain immediately and effectively any person by order or by suit in state court from engaging in any impending or continuing unauthorized activity which is causing or may cause damage to public health or the environment;

c. Establish the identity of emergency conditions which pose an imminent and substantial human health or environmental hazard that would warrant entry and immediate corrective action by the state agency after reasonable efforts to notify the operator have failed;

d. Sue or cause suit to be brought in courts of competent jurisdiction to enjoin any impending or continuing violation of any program requirement, including any permit condition, without the necessity of a prior revocation of the permit;

e. Require by administrative order or suit in state court, that appropriate action be undertaken to correct any harm to public health and the environment that may have resulted from a violation of any program requirement, including but not limited to establishment of compliance schedules;

f. Revoke, modify or suspend any permit upon a determination by the state agency that the permittee has violated the terms and conditions of the permit, failed to pay an assessed penalty, or used false or misleading information or fraud to obtain the permit; or

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[1] *In some states, enforcement remedies include authorities to cause cessation of production or transportation of product, and/or seizure of illegal product.*

g. Assess administrative penalties or seek in court civil penalties or criminal sanctions, including fines and/or imprisonment.

h. Forfeiture of financial assurance instruments.

4.1.3.2

States should consider guidelines for calculations of penalties that include factors such as the economic benefit resulting from the violation, willfulness, harm to the environment and the public, harm to wildlife, fish or aquatic life or their habitat, expenses incurred by the state in removing, correcting or terminating the effects of the unauthorized activity, conservation of the resource, timeliness of corrective action, notification of appropriate authority, and history of violations. Benefits of guidelines for calculation of penalties include consistency in the assessment of penalties and development of readily defensible assessments. Penalties should be such that an operator does not benefit financially from unlawful conduct, and should provide compliance incentive to other operators. States should evaluate their enforcement options and policies to assure that the full range of actions available are effectively used.

4.1.3.3

The right to appeal or seek administrative and/or judicial review of agency action should be available to any person having an interest which is or may be adversely affected, or who is aggrieved by any such action.

4.2 Additional Program Requirements

Beyond basic requirements, an effective state program should also include some or all of a variety of other administrative requirements that are discussed below.

4.2.1 Contingency Planning

The state agency should have authority to require an operator to comply with a general contingency plan approved by the state agency, or independently prepare and maintain a contingency plan for waste release prevention and control. Such a plan should describe the actions which the operator will take to prevent and respond to spills and accidental releases, including provisions for notification, remedial action, training, names of individuals to be contacted in the event of an incident, and other requirements similar to those contained in Spill Prevention Control and Countermeasure plans under the federal Clean Water Act's oil spill prevention provision.

4.2.2 Public Participation

4.2.2.1

State program legislation or regulations should require that the affected public be provided with adequate notice of the agency's intention to issue a permit that addresses E&P waste management. The public should be provided with an appropriate opportunity to comment on a permit prior to issuance. Wherever possible, this notice should be coordinated with the notice requirements of other concurrently applicable state or federal programs. For commercial or centralized disposal facilities, the operator should also be required to provide written notice to adjacent land owners of record for such area and in such manner as may be prescribed by the state agency. Agency

records related to this program should generally be available for review by the public. Where information submitted by an operator is of a "confidential business" nature, an agency should have procedures for segregating that information and protecting it from disclosure. In all cases, spill and violation records should be available to the public. Agencies should establish a minimum recordkeeping time period of three years which should be automatically extended while any unresolved enforcement action regarding the regulated activity is pending.

4.2.2.2

States should provide for the dissemination of program information to the regulated industry and the public. Such efforts should be part of an on-going process through which information is exchanged in an open forum. Because E&P waste management requirements are undergoing numerous changes, states have the obligation to inform the regulated industry and the public of changes. Industry associations may provide a convenient and effective mechanism for dissemination of information. States should actively make use of seminars, newsletters, special mailings, association committees, incentive programs and other mechanisms.

4.2.2.3

States should use advisory groups of industry, government and public representatives to obtain input and feedback on the effectiveness of state programs for the management of E&P wastes. Provision should be made for education or training as is appropriate to give such advisory groups a sound basis for providing input and feedback.

4.2.3 Financial Assurance

All states should develop a financial assurance program to provide resources to the state to close or remediate a site should an operator fail to meet its obligations under the law. Most states have financial assurance programs, although they vary widely in the specific activity covered, the type of assurance allowed, the amount of assurance required, and the mechanism for forfeiture of the financial instrument.

States should evaluate the activities that need to be covered by financial assurance. Some states require financial assurance for inactive wells, some for drilling and/or plugging, some for waste disposal facilities, and some for the life of the well. Some states require performance bonds and some states require penal bonds. States should consider combining their financial assurance requirements to allow a single instrument to provide coverage for an operator's various activities.

States should determine the types of financial assurances that will provide reliable monetary resources to the state. Types of financial assurance include surety bonds, self-bonding, letters of credit, certificates of deposit, cash, federal, state, or municipal bonds, and other forms of collateral. Some states accept a nonrefundable fee to be paid into the well plugging fund in lieu of a bond. Some states allow phased payments of collateral into a fund so that small operators can develop a collateral bond over a specified period of time. States should consider those financial assurance options which facilitate an operator's compliance with bonding requirements. For example, in addition to single well bonds, many states allow blanket bonds. This allows operators to assure that an established minimum level of financial assurance is provided without the commitment of an unnecessary amount of operating funds.

States should periodically review the amount of assurance required to determine if the amount is adequate to provide incentive for proper plugging of a well and reclamation of a site, and to assure proper management of E&P wastes.

States should develop appropriate procedures to access an operator's financial assurance when the operator does not meet the obligations covered by the financial assurance. These procedures should include provisions for notice, hearings, and forfeiture.

Some states have special funds, such as well-plugging funds, that are available for state use to correct problems where an operator is unable to comply with state requirements. Although the availability of such funds may be a consideration in some states when determining bond coverage amounts, special funds should be used to supplement, rather than completely take the place of, other forms of financial assurance provided by the operator. The use of special funds should be limited to instances where the responsible operator cannot be determined or is unavailable. These special funds can be generated by taxes, fines, forfeitures, or fees.

4.2.4 Waste Hauler Certification

The appropriate state agency should have authority to require the training of drivers of trucks which are involved in the commercial transportation of E&P waste to a commercial or centralized disposal facility. Such training should include, among other things, emphasis on proper recordkeeping, the need to deliver the waste to the designated facility and emergency response and notification procedures. The appropriate state agency should also have authority to require the registration of all vehicles used to commercially transport the waste, and of all commercial waste haulers.

4.2.5 Waste Tracking

Unless the state agency is utilizing an alternative method which achieves comparable results, the waste tracking requirements of these criteria (Section 5.7.2.3) should be used by the agency to regulate the transportation (other than by pipeline) of E&P waste to a commercial or centralized disposal facility. The waste generator, waste hauler and operator of the disposal facility should retain and make available for regulatory agency inspection all required waste tracking information for a minimum of three (3) years from the date of shipment. This record retention period should be automatically extended while any unresolved enforcement action regarding the regulated activity is pending.

4.2.6 Location of Closed Disposal Sites

In response to RCRA Section 3001(b)(2)(A)(i), a state program should contain authority with respect to disposal site closure including authority to identify the location of the disposal site and for such information to be maintained by the state agency for public review. Whether the location of a waste disposal site is disclosed in the public land records is a matter which is within the discretion of the state.

4.2.7 Data Management

Effective data management systems should be maintained due to the amount of information that states compile. Such systems should include permitting, operating, and monitoring information and should include those data elements that an individual state finds are necessary to make cost-effective, risk-based decisions. Data should be maintained on as detailed a level as is necessary for the agencies to conduct their regulatory reviews. States and the federal government should undertake efforts to facilitate the sharing of data among responsible agencies and other users. The IOCC and federal government should assist the states in developing and maintaining effective data management systems.

4.3 Personnel and Funding

4.3.1 Personnel

For a state program to function effectively, it must have sufficient, properly trained personnel to accomplish the goals and objectives of the program.

In determining its personnel needs, a state agency should consider not only the number of activities that it must regulate and inspect, but also the accessibility of those activities to agency personnel. Accessibility will be heavily influenced by the size of the area to be regulated, the local terrain and road conditions. In addition, a state agency should consider how its personnel needs will be affected by activities occurring in environmentally sensitive areas (e.g., in close proximity to surface water and groundwater).

Generally, personnel needs should be evaluated in each of the categories of administration, legal, technical and field inspectors. In each case, a state agency should define the areas of responsibility for the position, as well as any prerequisite experience and background. In addition, the state agency must provide for the continuing training of personnel to keep them abreast of changes in regulations, policy and technical issues and to increase professionalism. This training can be accomplished through such means as seminars and university short courses. The following discussion addresses these issues in each of the major personnel categories:

4.3.1.1 Administration

The elements of the administration of a state program should include traditional administrative functions such as program planning and evaluation, budgeting and personnel. In addition, administration should be responsible for such programmatic functions as permitting, licensing, financial assurance, and ownership transfer. Public involvement and data collection and management are also key elements of program administration. The conduct of public hearings, the coordination of enforcement activities and the referral of cases to legal personnel for follow-up action should also be administration functions.

4.3.1.2 Legal

Legal support for an E&P waste management program can be provided by in-house state agency lawyers, through the support of the attorney general's office, or through independent counsel. In any case, sufficient legal support should be provided to a state agency to assure that the regulatory program has an effective capability to pursue appropriate enforcement actions in a timely manner against violators of program requirements. A critical element of this capability is that the program's legal element be capable of directing the preparation of enforcement cases and providing guidance and direction to field inspectors and others involved in case preparation. The legal element of a program should also be involved in both the procedural and substantive aspects of rulemaking.

4.3.1.3 Technical

All program elements must receive adequate technical support. In supporting administrative functions, technical personnel should provide geologic and engineering evaluation and technical specifications on such matters as cementing and casing. Technical support to the legal and field personnel is necessary for the development and implementation of rules and in the preparation of enforcement cases. In support of field inspectors, technical personnel should be capable of mapping hydrologically sensitive areas and areas containing treatable water, and provide support in determining pit construction requirements and guidance in waste handling. Key technical personnel should have a bachelor of science degree in geology, engineering, hydrology, earth

science, environmental science, or a related field, or possess equivalent experience. Technical personnel should be subject to continuing education in such areas as ongoing development of rules, policies, and technological changes.

4.3.1.4 Field Inspectors

Field inspectors should be responsible for conducting routine inspections of regulated facilities and activities to assure compliance with program requirements. In addition, field inspectors should be among the state agency's on-site representatives to witness critical regulated activities and to observe or supervise clean-up or remedial actions. Field inspectors also should be involved in the assembly of evidence for enforcement actions and in the state agency's community relations. Field inspectors generally should be high school graduates or have equivalent experience and otherwise be knowledgeable about oil and gas field-related work and waste management practices. The ongoing training of field inspectors should emphasize sampling and investigative procedures associated with enforcement proceedings and a thorough understanding of current rules and policies of the program as well as sound environmental practices. In addition, field inspectors must be skilled in the handling of hazardous materials and in all aspects of personnel safety.

4.3.2 Funding

An effective E&P waste management program should be funded at a level sufficient to allow it to accomplish its goals and objectives. While most state agencies will be funded through a general appropriation from that state's legislature, each state agency should evaluate such other sources of funding as user fees, special levies on production, the dedication of fees and penalties to special accounts, and grants from various sources.

4.4 Coordination Among Agencies

Many state programs regulating the management of E&P wastes have their roots in oil and gas conservation programs that were established during the early part of this century. In most cases, these programs have evolved to accommodate other state and federal objectives such as protection of human health and the environment.

In most states, multiple agencies are involved in the management of E&P wastes. Different agencies are often responsible for the regulation of oil and gas wells, pits and impoundments, disposal wells, surface water discharges, and disposal of drill cuttings and muds. Each agency has its own administrative requirements relating to permitting and financial assurance and develops it own budget priorities. Each has its own inspection and enforcement authorities. Unless a high level of formal interagency coordination exists, such unilateral program implementation can lead to duplication of personnel effort, duplication of regulation with sometimes conflicting standards for the industry, and duplication of funding. Duplication of programs often diminishes the effectiveness of permitting, inspection, enforcement, training, and other regulatory activities. Where multiple state agencies have jurisdiction over the management of E&P wastes, budget development should be coordinated.

The review of the state programs (Appendix B) showed that many do not have formal agreements providing for the coordination of activities among agencies. The coordination of permitting, inspection, enforcement and training provides an economic benefit to the agencies and assures that no regulatory gaps occur in the regulation of the industry. The Council did not review the adequacy of individual memorandums of agreement or memorandums of understanding. States with multiple agencies having jurisdiction for E&P waste management should develop formal coordination mechanisms. Additionally, states should review existing agreements to assure that they are current and effective. They should hold regularly scheduled meetings among or between involved agencies and should share information so that each agency can more fully carry out its program responsibilities.

4.5 State and Federal Relations

Periodic evaluations of state and federal E&P waste management programs have proven useful in improving the effectiveness of those programs and increasing cooperation between federal and state regulatory agencies. Peer review-based evaluation mechanisms have demonstrated the need for establishment of a performance baseline by which E&P waste management programs can be evaluated. Those mechanisms have led to the identification of strategies that will improve relations between the states and the federal government.

4.5.1 Background

4.5.1.1 Initiatives

Initiatives that have been undertaken to explore relations between state and federal agencies and which are relevant to the Council's efforts include:

a. the Mid-Course Evaluation of state and federally implemented Class II UIC programs;

b. a federal/state enforcement and compliance steering committee which addresses timely and appropriate enforcement in EPA regulatory programs;

c. the Keystone Center National Waste Management Strategies Project which addressed, among other things, state and federal relations; and

d. the peer review process of state UIC programs being conducted by the Underground Injection Practices Council.

4.5.1.2 Results

Results of these initiatives included:

a. the recognition that there may be differing program and enforcement expectations and priorities among states, EPA headquarters and EPA regions;

b. the recognition that variable approaches to regulation may be necessary or beneficial;

c. the need to establish a baseline of performance by which state and federal agencies can judge the effectiveness of their programs;

d. the need for continued dialogue between various regulatory parties; and

e. the recognition that programs and priorities may need to change as knowledge increases.

4.5.2 Strategies for Maintaining A Successful Relationship Between State and Federal Agencies

As stated in EPA's regulatory determination for E&P waste, "...existing state and federal regulations are generally adequate to control the management of oil and gas wastes. Certain regulatory gaps do exist, however, and enforcement of existing regulations in some states is inadequate." The key is that overall state programs are adequate. To address these gaps, the focus of future efforts should be to utilize information developed through EPA studies and investigations, and augmented by the criteria and information developed by the Council. Given that information, EPA, working through the IOCC, can meet with and provide guidance and assistance to states that need to improve their programs.

The Council has identified 10 interrelated strategies that, if implemented, would enhance state and federal relations and promote effective management of oil and gas wastes.

a. Commitment to Work Cooperatively. State and federal agencies should take steps to encourage open communications among state and federal agencies, the regulated industry and other interested parties on issues pertaining to the management and regulation of E&P wastes.

The states and federal agencies should maintain a commitment to work cooperatively to improve the design, implementation and enforcement of state and federal programs for managing E&P wastes.

b. Recognition of Different Priorities. States should recognize the interest of federal agencies in achieving national goals and objectives and assuring adherence to federal and state statutory and regulatory requirements. At the same time, federal agencies should recognize the authorities, responsibilities and capabilities of states to regulate certain activities within their borders.

c. Recognition of Different Statutory Objectives. Each of the federal statutes governing protection of the environment (e.g., RCRA, the Clean Water Act, Safe Drinking Water Act) has provisions for state implementation of certain provisions and for federal oversight. The objectives of and authorities granted by each statute differ. As such, it should be recognized that federal and state authorities and implementation approaches may differ.

d. Recognition of Regional Diversity. As discussed in the Report to Congress and the legislative history of the Safe Drinking Water Act, variable approaches to the management of E&P wastes are necessary. These variable approaches are partly a result of the varying geologic, hydrologic or historic conditions in different states and in different areas within a state, the diverse characteristics of oil and gas activities, and differences in state government structures among the producing states. Guidelines or criteria, whether issued by a federal agency such as EPA or as advocated by the IOCC, should be sufficiently flexible to permit states to take into account these varying conditions.

e. Baseline of Performance. The criteria developed by the Council should be used by any federal or state agency that is responsible for any portion of the E&P waste management program. These criteria should serve as a baseline of performance by which the effectiveness of programs can be judged.

The criteria provide states flexibility to address unique conditions while accomplishing the goals set forth in Section 3. The criteria and the process by which they may be implemented by the states is similar in concept to Section 1425 UIC programs under the Safe Drinking Water Act. In these programs, state underground injection control programs demonstrate adherence to the goal of protecting underground sources of drinking water, rather than adherence to a detailed checklist of quantitative standards. The baseline contained in this report can be used in a similar fashion by EPA, Congress and others who may evaluate E&P waste management programs such as in the state program review process described below.

f. State Responsibility for Enforcement. Enforcement is a critical component of a state E&P waste management program. Federal government involvement should occur only if the state agency fails to enforce the requirements or requests federal assistance.

g. State Program Review Process. The IOCC should initiate a state program review process that would provide states with an independent evaluation of their E&P waste management programs using criteria developed by the Council. An advisory panel to develop the review process should include representatives of state oil and gas and environmental agencies, federal agencies, industry and the public. The review process would also increase the knowledge of participating states as to the content and operation of other state E&P waste management programs.

h. Resolving Conflicts/Building Consensus. Where there are unresolved national issues or concerns regarding E&P waste management, a task force should be created which is similar in makeup and form to that established for the EPA's Office of Drinking Water Mid-Course Evaluation of Class II UIC programs. The creation of this task force would bring knowledgeable federal and state regulators together to discuss issues, to ascertain whether problems associated with these issues are real or perceived, and to decide how best to address the issues. This process should be based on the best available information and could be initiated by either the federal government or the states.

i. Effective Multi-Agency Coordination. Coordination among the state agencies is addressed in more detail in another section of the Council's report. However, each state should recognize that coordination between various agencies is necessary for building and maintaining trust between the state agencies and the federal agency that has oversight responsibilities.

j. Technical and Financial Assistance. The federal government should provide technical and financial assistance to states to improve the design, implementation and enforcement of state E&P waste management programs. Such assistance may be in the areas of training, enforcement and data management. Federal oversight of a state E&P waste management program could be a condition of such assistance.

SECTION 5

TECHNICAL CRITERIA

5.1 General

These technical criteria for E&P waste management practices address pits, land applications, centralized and commercial facilities. In most cases, these criteria are general in scope. The states are encouraged to establish and implement specific performance standards and design specifications based on site-specific or regional differences in geology, hydrology, climate and waste characteristics. State E&P waste management programs should include the following general provisions as requirements:

a. Facilities and sites used for the storage or disposal of wastes derived from the exploration and production of oil and natural gas should be operated and managed at all times to prevent contamination of ground and surface water, soil and air, protect public health, safety and the environment, and prevent property damage.

b. Facilities and sites operated for the storage or disposal of E&P wastes should not receive, collect, store or dispose of any wastes that are listed or defined as hazardous wastes and regulated under Subtitle C of RCRA, except in accordance with state and federal hazardous waste laws and regulations.

c. Technical criteria for siting, construction and operation of E&P waste disposal facilities should be flexible enough to address site-specific or regional conditions, based on findings by the regulatory agency.

d. Disposal of drilling muds and drilling fluids into municipal waste landfills should not be considered when better disposal options are available. However, drilling muds and drilling fluids with no free liquids that are not mixed with any other wastes may be disposed of in municipal waste landfills only when such landfills are designed to contain such wastes. Low volume E&P wastes, such as oily rags and drained filters, and any other E&P wastes that are similar in composition to routine municipal solid waste streams may be disposed of in municipal solid waste landfills.

e. As in any aspect of waste management, there are some general, sound practices that should be employed. These practices, which include waste minimization, not only serve to protect human health and the environment, but also tend to protect waste generators from long-term liabilities associated with waste disposal. As a rule-of-thumb, the choice of a waste management option should be based upon the following hierarchy of preference:

i. Source Reduction -- reduce the quantity and/or toxicity of waste generated;

ii. Recycling -- reuse or reclaim as much of the waste generated as possible, and whenever possible, hydrocarbons should be combined with crude oil, condensate or natural gas liquids;

iii. Treatment -- employ techniques to reduce the volume or the relative toxicity of waste that has been unavoidably generated;

iv. Proper Disposal -- dispose of remaining wastes in ways that minimize adverse impacts to the environment and that protect human health.

f. Nothing in these criteria mandates onsite testing for every hazardous constituent that may be present in E&P wastes. Rather, these criteria call for appropriate onsite testing of E&P wastes prior to disposal

for such characteristics as organic content, pH, salinity, hydrogen sulfide content, and ignitability--the chemical characteristics that are thought to be of primary concern in E&P wastes. The Council recognizes, however, that waste management practices, and regulatory requirements, would be improved by obtaining a more complete knowledge through testing and analysis of the range of hazardous and toxic constituents in E&P wastes.

5.2 Quantitative Elements

Specific quantitative guidelines have been included for some waste management practices. The numbers cited are considered to be conservative values for protection of human health and the environment. However, they are not intended to be the basis for nationwide standards. Regulatory agencies may approve either less stringent or more stringent requirements where circumstances warrant as long as they afford the protection described in Section 5.1.a. and in the goals statement of Section 3.2.

5.3 Technical Criteria for Pits

5.3.1 Definitions

a. Reserve Pits

Pits used (a) to store additional drilling fluids for use in drilling operations, and/or (b) to dispose of wastes generated by drilling operations and initial completion procedures.

b. Production Pits

i. Skimming/Settling--pits used to provide retention time for settling of solids and separation of residual oil.

ii. Produced Water--pits used for storage of produced water prior to injection or offsite transport.

iii. Percolation--pits used to dispose of waste liquids via drainage or seepage through the bottom and/or sides of the pits into surrounding soils.

iv. Evaporation--lined pits used to contain produced waters which evaporate into the atmosphere by natural thermal forces.

c. Special Purpose Pits

i. Blowdown--pits used for collecting material resulting from the emptying or depressurization of wells or vessels.

ii. Flare Pits--pits used exclusively for flaring gas.

iii. Emergency--pits used to contain liquids on a temporary basis due to process upset conditions.

iv. Basic Sediment--lined pits used for temporary storage of production wastes from tank batteries or production vessels which may contain residual oil.

v. Workover--pits used to contain liquids during the performance of remedial operations on a producing well in an effort to increase production.

5.3.2 Permitting

a. A permitting or review process should be in place for all pits. Pits may be authorized by rule, general permit, individual permit, or as part of an operational permit or program.

b. Pits may be permitted by rule based upon specific requirements in areas where geologic, topographical, hydrological or other conditions are similar.

c. Authorization for a pit may be included in operational, facility or other environmental permits (e.g., drilling, workover, gas plant, NPDES discharge). The permit application process may have to be expanded to include certain additional information concerning the pit (i.e., intake volume, soil type, fluid makeup, topography, geology, hydrology, climatology, and such other factors as may be necessary to protect human health and the environment).

d. Construction and use of rule authorized pits should require prior notification of the appropriate regulatory agency to ensure that proper construction, operation and closure methods are used to protect human health and the environment.

e. State programs should include provisions to accommodate approval of pits for emergency situations.

5.3.3 Siting

General siting guidelines or restrictions should be included in area or state-wide regulations to address issues such as: fluid makeup, depth to and quality of groundwater, wetlands, flood plains, surface contour, and proximity to drinking water supplies and wells, surface water, residential or commercial buildings, geologic hazards, or other environmentally sensitive areas.

5.3.4 Construction

General standards for construction of pits should be included in area or state-wide regulations and should address the following items:

a. Size should be sufficient to ensure adequate storage until closure taking into account historical precipitation patterns.

b. Depth should be such that the bottom does not penetrate groundwater or such that the pit contents do not adversely impact groundwater or surface water. A review of available information or a study should be made of the area where the pit is to be located to determine if shallow aquifers are present and should be protected.

c. Berm height, slope and material should be such that the pit is structurally sound, and that pit integrity is not compromised by terrain or breached by heavy rains, winds, seepage or other natural forces.

d. If a salt section is anticipated, or oil base muds are used during a drilling program, reserve pits should be designed to accommodate those fluids.

e. Tanks or liners should be required in certain instances based on type of fluid and site-specific characteristics (e.g., unconsolidated soils and/or hydrogeologic conditions that create a potential for adverse impact to surface water or groundwater, and proximity to environmentally sensitive areas). Liners can be natural or constructed of natural or synthetic materials, provided

that they are installed according to accepted engineering practices and are compatible with expected pit contents.

f. Fencing, flagging and caging requirements should be set by area or state-wide regulations as may be necessary to protect the public, domestic animals, wildlife and waterfowl.

g. Where feasible, reserve pits should be placed to directly receive the discharge from solids separation equipment and to collect rigwash water, spills, and leaks from drilling equipment.

h. Unlined skimming/settling pits can be used in areas where groundwater either is not present or is unusable or is naturally protected from the threat of contamination.

5.3.5 Operational Requirements

a. Specific restrictions on the type of wastes that can be placed in the different types of pits should be included in area or state-wide regulations. Restrictions should consider salinity, hydrocarbon content, pH, or other characteristics which may be detrimental to the environment.

b. General security guidelines should protect the public, the environment, and wildlife.

c. Liquids should be maintained at a freeboard level determined by the state that takes into account extreme precipitation events or other possibilities and prevents overtopping or unpermitted discharges.

d. Lined pits should be operated in a manner that ensures liner integrity.

e. Inspections should be conducted at regular intervals or as needed by operators to ensure pits meet all operating and structural integrity requirements.

f. Hydrocarbons which inadvertently accumulate in an unlined reserved pit should be skimmed off the pit at the cessation of drilling and completion operations.

g. Separated oil or accumulated wastes should be periodically removed from unlined skimming/settling pits.

h. Produced water pits should be used only for storage of produced water prior to injection or offsite transport.

i. Percolation pits should be used only for disposal of produced waters and only when area or state-wide restrictions established under Section 5.3.5.a. above are met.

j. Evaporation pits should be periodically inspected for compliance with permitted input volumes and liner integrity. Evaporation pits should be skimmed as necessary to maintain an optimum evaporation rate.

k. Blowdown, flare, and emergency pits should not be used for long-term storage or disposal. Fluids diverted to emergency pits should be removed as quickly as practical and the regulatory agency notified promptly of the use of those pits.

l. Unlined basic sediment pits should not be used for storage of oily wastes; they should be replaced by lined pits or tanks.

m. Workover pits should be open only for the duration of workover operations and should be closed within 120 days after workover operations are complete.

5.3.6 Closure

a. Pits should be closed in accordance with local, state and federal regulations, and if on private property, consistent with lease obligations.

b. Reserve pits should be closed as soon as practical or within 12 months after cessation of drilling operations.

c. Pit liquids should have free oil removed and when appropriate should be sampled prior to closure for salinity, hydrocarbon content, pH, or other characteristics which may be detrimental to the environment. Onsite disposal of pit contents should be conducted in accordance with the landspreading, burial and landfilling criteria of Sections 5.4 and 5.5, or by NPDES or UIC permit.

d. Liquid and nonliquid materials not satisfying the onsite criteria for landspreading or burial (Sections 5.4 and 5.5) must be disposed in federal or state approved disposal facilities.

e. Pit sites should be capped, compacted, contoured and vegetated where necessary and in accordance with applicable state or area regulations to ensure ground support stability and to prevent erosion.

f. Records should be kept at the regulatory agency of all pit locations and should be available to the public for inspection and copying.

5.4 Technical Criteria for Landspreading

5.4.1 Definition and Applicability

a. Landspreading is a method of treatment and disposal of low toxicity wastes in which the wastes are spread upon, and sometimes mixed into, soils to promote reduction of organic constituents and the dilution and attenuation of metals. Landfarming or multiple applications are covered under Section 5.7.

b. These criteria apply to waste disposal at or near E&P locations and do not apply to commercial disposal operations. Commercial facilities used for disposal of E&P wastes are covered in Section 5.7.

5.4.2 Regulatory Requirements

When landspreading practices are used at E&P sites, they should be conducted consistent with lease and landowner obligations and local, state and federal regulations. General standards for landspreading should be included in area or state regulations and should address the operational requirements of Section 5.4.3.

5.4.3 Operational Requirements

a. Free oil should be removed from the wastes by mechanical means such as skimming or filtration before the wastes are landspread.

b. Landspread liquids should have a pH of 6-10. Where needed, liquids should be neutralized to obtain this range.

c. Solid wastes should be spread evenly and disked into the soil.

d. Liquids should be applied at a rate that will not result in pooling, ponding or runoff.

e. Where enhancement of biodegradation is desired, nitrogen and other nutrients should be added to the soil before disking. Nutrient application can be repeated over time.

f. Amounts of waste added to soil during landspreading are generally limited by the electrical conductivity (EC), exchangeable sodium percentage (ESP), and sodium adsorption ratio (SAR). The state should determine its criteria based on site-specific and waste-specific conditions. For example some plants tolerate higher or lower salt levels, higher rainfall areas encourage salt movement out of the root-zone, or shallow groundwater may severely limit application.[1]

g. After landspreading of hydrocarbon containing waste, the waste-soil mixture should not exceed one percent by weight oil and grease.

h. Salt- and hydrocarbon-loading criteria apply to the final waste-soil mixture and are not an application standard. The operator should be required to demonstrate that these criteria are met within 12 months of cessation of drilling or production. If these criteria are not met, remediation will be required. Nothing in this paragraph shall delay any requirement for erosion control and/or site reclamation or revegetation.

i. Soil analyses should be performed prior to landspreading and again upon closure of the site.

j. Enhanced techniques such as repetitive disking and nutrient addition may be needed to meet the salt and hydrocarbon criteria of the final waste-soil mixture.

k. Under special or abnormal conditions, additional limitations and analysis requirements should be considered for wastes that may contain toxic constituents derived from formation liquids, cuttings drilling muds, or drilling-mud activities. Records should be maintained of all waste analyses.

5.5 Technical Criteria for Burial and Landfilling

5.5.1 Definitions

a. Burial of wastes involves placing the wastes in an excavation and covering the wastes with a layer of soil.

b. Landfilling of wastes involves placing the wastes on the ground and covering them with a layer of soil.

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[1] *A study prepared for the American Petroleum Institute determined safe limits for agricultural purposes as follows: EC less than 4 mmhos/cm, ESP less than 15, and SAR less than 12. Lloyd E. Deuel, Jr., Ph.D., "Evaluation of Limiting Constituents Suggested for Land Disposal of Exploration and Production Wastes" (March 1990).*

c. These criteria apply to waste disposal at or near E&P sites and do not apply to commercial disposal facilities. Criteria for commercial disposal facilities are contained in Section 5.7.

5.5.2 Regulatory Requirements

When burial or landfilling is used at E&P sites, either should be conducted consistent with lease and landowner obligations and with local, state and federal regulations. General standards for burial or landfilling should be included in area or state regulations and should address the operational requirements in Section 5.5.3.

5.5.3 Operational Requirements

a. Wastes or waste-soil mixtures may be buried or landfilled without a protective bottom liner only when they meet the landspreading criteria of Section 5.4 prior to burial. The contents of such waste or waste-soil mixtures should be limited to materials such as fresh water based drilling muds, drill cuttings, spent iron sponge, pipe scale with low levels of naturally occurring radioactive materials (NORM), gas plant catalyst or molecular sieve. Closure should be consistent with Section 5.3.6.a and 5.3.6.e.

b. A protective bottom liner, solidification, fixation or encapsulation method should be required for burial or landfilling of wastes whose salt and/or hydrocarbon content exceeds the landspreading criteria of Section 5.4.3. The regulatory agency may grant a variance from this requirement for fields or portions of fields, upon a showing by the operator that groundwater either is not present beneath the waste site or is naturally protected from the threat of contamination.

c. Agency records should be permanently maintained for any required analytical data taken, sites used and types and quantities of waste disposed. Site locations should be located on plat maps.

5.6 Technical Criteria for Roadspreading

5.6.1 Definition

Roadspreading is the placement on roads of wastes that exhibit properties similar to commercial road oils, mixes, dust suppressants or road compaction brines.

5.6.2 Regulatory Requirements

When roadspreading is used, it should be conducted consistent with lease and landowner obligations and local, state, and federal regulations. General standards for roadspreading should be included in area or state regulations and address the operational requirements in Section 5.6.3.

5.6.3 Operational Requirements

a. Exempt wastes such as tank bottom, emulsions, heavy hydrocarbons and crude oil-contaminated soil may be used for road oil, road mix, or asphalt if they are not ignitable (40 CFR § 261.21) and have a mixed density and metal content consistent with approved road oils or mixes.

b. Hydrocarbon wastes or produced waters should be applied at loading rates that prevent pooling and surface runoff. Appropriate buffer zones should be established to protect waters of the state and water wells.

c. The produced water should be tested and should exhibit properties similar to commercial roadspreading products that are regulated by states or local agencies.

5.7 Technical Criteria for Commercial and Centralized Disposal Facilities

5.7.1 Definitions and Exemptions

a. Commercial Disposal Facility -- a facility whose owner(s) or operator(s) receives compensation from others for the temporary storage, treatment, and disposal of produced water, drilling fluids, drilling cuttings, completion fluids, and any other exempt E&P waste, and whose primary business objective is to provide these services.

b. Centralized Disposal Facility -- a facility, other than a commercial disposal facility, that is (1) used exclusively by one owner or operator, or (2) used by more than one operator under an operating agreement, and which receives for collection, treatment, temporary storage, or disposal of produced water, drilling fluids, drill cuttings, completion fluids and any other exempt E&P wastes that are generated from two or more production units or areas or from a set of commonly owned or operated leases. This definition covers the storage and disposal facilities (i.e., lined or unlined pits or ponds, and below grade or underground tanks) that are present at Class II disposal well sites.

c. Exemptions -- The definitions and technical criteria of Section 5.7 shall not apply to Class II produced water injection wells and to wells used in enhanced oil recovery or "waterflood" projects, or to the above-ground storage tanks at Class II injection well sites, waterflood project sites, and produced water gathering sites, where E&P wastes are stored temporarily prior to disposal. The definitions and technical criteria of Section 5.7 are not intended to apply to emergency cleanup situations at a Class II injection facility. The regulatory agency may adjust or exempt from the standards and requirements of this section centralized facilities that receive a limited number of substantially similar waste streams and limited volumes of wastes.

5.7.2 Technical Standards and Regulatory Requirements

Commercial and centralized offsite disposal facilities should meet the technical and regulatory requirements of this section and the general standards of Section 5.1 of these criteria. Compliance with these requirements should be demonstrated in the permit application required in subsection 5.7.2.1.a. Recognizing that commercial disposal facilities use advanced methods of treatment and disposal of wastes, the regulatory agency is encouraged to establish numerical requirements for the design of pond liners and leachate collection systems, for landfarming operations (i.e., repeated land applications), and for waste-oil reprocessing. The requirements of this section are intended to furnish the regulatory agency with sufficient and meaningful information such that permitting decisions will lead to no environmental or public health impact once the facility has commenced operations and following its closure.

The regulatory agency may adjust or exempt from these requirements for centralized facilities that receive a limited number of substantially similar waste streams and limited volumes of waste, such as the consolidated produced water disposal facilities in a large multi-operator field. Administrative criteria for centralized facilities also may be less extensive than those for commercial facilities.

5.7.2.1 Regulatory Agency Responsibilities in Permitting

a. Permits. The regulatory agency should authorize off-site commercial and centralized disposal facilities for E&P wastes by permit. A permit should be in force for a finite period, to be determined by the agency. The agency should use the data and information required by the technical standards of this section to approve or deny applications for permits, to ensure compliance with permit conditions, to order corrective actions in order to prevent or abate violations of the standards, or for any other purpose deemed necessary by the agency.

b. Acceptable Wastes. The agency should prescribe the range of E&P wastes which can be disposed at commercial and centralized facilities and at municipal waste landfills.

c. Waste Characteristics and Disposal. The agency should identify the chemical characteristics of wastes likely to be disposed at commercial and centralized facilities on the basis of published scientific data and on knowledge about regional or site-specific waste characteristics. This information should be used by the agency to match a given disposal apparatus (e.g., a lined evaporation pond with a leak detection system) with a particular waste stream. The agency should prescribe these waste disposal facilities and waste stream relationships by rule or in the permitting process and ensure that operators of commercial or centralized facilities comply with them. For sampling and testing, refer to Section 5.7.2.2.c.v. and vi.

5.7.2.2 Permitting Requirements

a. Any new or existing commercial or centralized facility must obtain a permit from the regulatory agency to commence operation or to continue to operate. A permit should be issued only upon compliance with the general requirements of Section 5.1 and the technical requirements of this section and upon submittal and approval of an application that contains a Siting Plan, Construction Plan, Operating Plan, and Closure Plan. Operation of a facility should comply with the terms and conditions of the permit.

The regulatory agency may tailor the technical requirements for all existing facilities and for centralized disposal facilities to the conditions present at the locations of such facilities. In the case of centralized facilities, the regulatory agency may adjust the requirements of 5.7.2.2a, b, and c in light of the volume and characteristics of wastes received by the facility.

b. Siting Plan. The specific site for a commercial facility, or to the extent possible the site for a centralized facility, should have natural features (such as isolation from or considerable depths to groundwater, protection against flooding, presence of low-permeability soils and rocks, and topography conducive to protection against wind erosion) that prevent or minimize release of pollutants to offsite waters, lands and air. Additional safeguards may be required by the regulatory agency for centralized facilities that are located on sites that do not exhibit natural protective features. An application for a permit to site a commercial or centralized facility should contain the following information:

i. Names, addresses and telephone numbers of owners and the operators of the facility, the owner(s) or occupant(s) of properties within close proximity of the site, or any nearby person who may reasonably be adversely affected by release from the site;

ii. Topographic map showing the location of the site and any highways or roads that abut or traverse through the site, and that depict all water courses, water wells, and dwellings located within one mile of the site;

iii. Geologic, hydrologic, engineering, chemical and any other data or information that demonstrate disposal of wastes and operation of the facility will not contaminate fresh water, the surrounding soils or air, endanger public health, safety or the environment, or cause property damage;

iv. Average annual precipitation and evaporation rate at disposal site;

v. Proximity of disposal facilities to surface water courses (priority in net-precipitation climates);

vi. Nature and permeability of vadose zone; description of the subsurface strata, identification of and areal extent of underlying aquifer(s), and depth to groundwater; direction of groundwater movement; data on water quality of nearby surface waters and underlying aquifer(s) prior to commencement of operations; and points of past or current use of surface water or groundwater;

vii. Proof that all public notice requirements have been met; and

viii. Certification by an authorized representative of the applicant that information submitted in the application is true, accurate and complete to the best of the applicant's knowledge.

c. Construction Plan. In general, commercial and centralized disposal facilities should be constructed to prevent or minimize releases of wastes or waste byproducts to surface water, groundwater, soils and air. For commercial facilities, detailed engineering drawings and diagrams of engineered disposal facilities should be required; for centralized, or one-owner facilities, such extensive construction details may not be needed. Construction should follow guidelines and rules adopted by the regulatory agency.

d. Operating Plan. Applications for permits for existing or new facilities should be accompanied by an Operating Plan that describes the wastes that will be accepted at the facility and the methods by which those wastes will be managed and disposed. The Operating Plan should contain the following information:

i. Volume, rate and type of material to be disposed at the facilities and the facilities that will be used to dispose of each waste stream (i.e., unlined or lined pits, above- or below-grade tanks, etc.);

ii. Contingency plan for reporting, responding to and cleaning up spills, leaks and releases of wastes or waste byproducts, including provisions for notifying emergency response authorities and for taking operator-initiated emergency response actions;

iii. Plan for routine inspection, maintenance, and monitoring to ensure and demonstrate compliance with permit requirements;

iv. Specific engineering plans for preventing or minimizing the generation and emission of hydrogen sulfide gas;

v. A plan, including consideration of on-site sampling and testing, to assure that RCRA Subtitle C or other prohibited wastes are not disposed of at the facility.

vi. Centralized and commercial waste disposal facilities must submit a plan to characterize wastes received for disposal. Larger facilities may require more testing requirements.

Waste characterization requirements for small centralized facilities may be more limited than far large facilities, based on the limited types and volumes of wastes received. At a minimum, waste characterization must consist of testing for organics, pH, salinity, hydrogen sulfide content, and ignitability. States should determine additional minimum testing criteria applicable to their regions. Testing for organics must be appropriate for the type of waste, method of disposal, and the potential for health and environmental hazards posed by that situation.

vii. Plan for periodic removal and subsequent handling of free oil; and

viii. Security plan for the facility.

e. Closure Plan. Applications for permits for existing or new facilities should be accompanied by a Closure Plan that describes the methods to be used to reclaim the facility following the cessation of operations. Closure shall comply with the general requirements of Section 5.1 and the burial requirements of Section 5.5 of these criteria, and with any other requirements established by the regulatory agency. The plan should include a closure schedule, a cost estimate for reclamation and a schedule for authorized financial assurance instrument. The cost estimate and authorized financial assurance instrument schedule shall be used to establish a financial surety level for the facility prior to permit approval.

5.7.2.3 Waste Tracking Requirements

To assure that only wastes derived from the exploration and production of oil or natural gas are disposed of at commercial or centralized facilities, a waste tracking system that documents the movement of wastes from the site of their origin to their final disposition should be implemented. The following elements should be included in the waste tracking system:

a. Three-Part Form Required. A three-part form that contains the names, addresses and phone numbers of the generator (producer), hauler, and disposal facility operator; a description of the waste; the time and date it was collected, hauled and deposited at the disposal facility; and the volume of the waste hauled.

b. Maintenance of the Form. The form should be maintained by the generator (producer), hauler and operator of the disposal facility for inspection by the regulatory agency. The forms should be maintained for a period of three years after the shipment date.

c. Attest to No Illegal Dumping. The hauler and the operator of the disposal facility should certify in writing on the three-part form that no wastes were dumped illegally or at a location or facility not designated by the generator or permitted to receive exempt E&P waste, and that no prohibited oil-field or hazardous wastes were mixed with the exempt wastes during transport.

d. Reporting of Discrepancies. The operator of the disposal facility shall immediately report to the regulatory agency and the generator any discrepancy in waste descriptions, volumes or place of origin based on personal observations or information contained in the three-part form.

e. Permitting of Waste Haulers. Waste hauling companies should be permitted by the regulatory agency based on a showing of minimum knowledge about the regulatory requirements for disposition of E&P wastes transported from their point of generation to their final disposal site. The regulatory agency may issue permits to individual waste haulers or to waste hauling firms.

5.7.2.4

These waste tracking requirements do not apply to wastes moved by pipeline. Operators who transport wastes by pipeline should periodically report waste quantities to the regulatory agency.

SECTION 6

RECOMMENDATIONS FOR FUTURE WORK

1. The Council encourages industry, individual states and federal government to increase their efforts to characterize chemical constituents and naturally occurring radioactive materials (NORM) of exploration and production wastes.

2. The Council encourages research by industry, the federal government, state-affiliated academic institutions, and public-interest groups into effective ways of minimizing and reusing wastes generated in the nation's oil and gas fields.

3. The Council recognizes that contamination problems exist from the use of past management practices and from violation of regulations and laws. As such, it recommends that IOCC, EPA, states, the regulated industry and the public work together to evaluate and recommend remediation approaches.

4. The Council recommends that IOCC review and act upon EPA's recommendations that may result from the agency's mid-course review of state UIC programs. IOCC should incorporate in these technical criteria any changes that may be needed to address problems or improvements in state-administered UIC programs.

5. The Council encourages the state and federal governments to examine the benefits and economic and energy impacts of changes in E&P waste managements requirements.

6. The Council encourages EPA to work with all interested parties in the development of any regulations on guidance that affect E&P activities.

SECTION 7

REFERENCES

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APPENDIX A

GLOSSARY OF TERMS

GLOSSARY

The following is a glossary of selected terms used in the Interstate Oil Compact Commission Council on Regulatory Needs Report on Regulation of Exploration and Production Wastes (Report). The glossary is included only as an aid for the convenience of the reader. It is not intended as an exhaustive compilation of the terms used in the Report nor are the definitions set forth intended to be preclusive of other potential meanings. Terms expressly defined in the text of the Report are not included in this glossary.

A

Acid: A chemical compound, one element of which is hydrogen, that dissociates in solution to produce free-hydrogen ions. For example, hydrochloric acid, HCl, dissociates in water to produce hydrogen ions - H^+, and chloride ions, Cl^-.

API: The American Petroleum Institute. Founded in 1920, this national oil trade organization is the leading standardizing organization on oil-field drilling and production equipment. It maintains departments of transportation, refining, and marketing in Washington, D.C., and a department of production in Dallas.

Aquifer: A geological formation, group of formations, or part of a formation that is capable of yielding water to a well or spring.

B

Barrel (bbl): A measure of volume for petroleum products. One barrel (1 bbl) is equivalent to 42 U.S. gallons.

Basic Sediment and Water (BS&W): The water and other extraneous material present in crude oil.

Biodegradation: Process of breaking down matter into innocuous products by the action of living things, such as microorganisms.

Blowdown: The material discarded as a result of depressurizing a vessel or well.

Brackish Water: Water that contains relatively low concentrations of soluble solids. Brackish water has more total dissolved solids than fresh water but considerably less than sea water.

Brine: Water that has a large quantity of salt, especially sodium chloride, dissolved in it; salt water and produced water are considered brines.

C

Climatology: The science that deals with climates (the prevailing influence or environmental conditions characterizing a group or period) and their phenomena.

Completion Fluid: A special fluid used when a well is being completed. It is selected not only for its ability to control formation pressure, but also for its properties that minimize formation damage.

Completion Operations: Work performed in an oil or gas well after the well has been drilled to total depth. This work includes, but is not limited to, setting the casing, perforating, artificial stimulation, production testing, and equipping the well for production, all prior to the commencement of the actual production of oil or gas in paying quantities, or in the case of an injection or service well, prior to when the well is plugged and abandoned.

Corrosivity (RCRA): The hazardous characteristic of corrosivity for purposes of RCRA is defined in 40 CFR 261.22 and generally includes aqueous material with a pH less than 2.0 or greater than 12.5 and/or liquids which corrode SAE 1020 steel at greater than 6.35 mm per year.

Crude Oil: Unrefined liquid petroleum. It ranges in gravity from 9° to 55° API and in color from yellow to black, and it may have a paraffin, asphalt, or mixed base. If a crude oil, or crude, contains a sizable amount of sulfur or sulfur compounds, it is called a sour crude; if it has little or no sulfur, it is called a sweet crude. In addition, crude oils may be referred to as heavy or light according to API gravity, the lighter oils having the higher gravities.

D

Disking: The process of using a tractor-pulled set of disks to mix surface soil.

Disposal Well: A well employed for the injection of produced water into an underground formation.

Drill Cutting: The formation rock fragments that are created by the drill bit during the drilling process.

Drilling Fluid: The circulating fluid used in the rotary drilling of wells to clean and condition the hole and to counterbalance formation pressure. A water-based drilling fluid is the conventional drilling mud in which water is the continuous phase and the suspended medium for solids, whether or not oil is present. An oil-based drilling fluid has diesel, crude or some other oil as its continuous phase, with water as the dispersed phase. Drilling fluids are circulated down the drill pipe and back up the hole between the drill pipe and the walls of the hole, usually to a surface tank. Drilling fluids are used to lubricate the drill bit, to lift cuttings, to seal off porous zones, and to prevent blowouts.

E

Electrical Conductivity (EC): A numerical expression of the ability of a material to carry a current; the reciprocal of resistivity; normally expressed in milliohm/meter. It is frequently used in soil analysis to evaluate a soil's ability to sustain plant growth.

Emulsion: A mixture in which a liquid, termed the dispersed phase, is uniformly distributed (usually as minute globules) in another liquid, called the continuous phase or dispersion medium. In an oil-water emulsion, the oil is the dispersed phase and the water the dispersion medium; in a water-oil emulsion the reverse holds. Emulsions occur during production processes where crude oil is prepared for pipeline transportation.

EPA: United States Environmental Protection Agency.

Exploration: The search for reservoirs of oil and gas, including aerial and geophysical surveys, geological studies, core testing, and the drilling of wildcats.

Exchangeable Sodium Percentage (ESP): The extent to which the absorption complex of a soil is occupied by sodium.

$$ESP = \frac{\text{exchangeable sodium}}{\text{cation exchange capacity}} \times 100$$

Where the units for both the numerator and denominator are in milliequivalents per 100 grams of soil.

F

Field: A geographic area which contains one or more producing formations.

Formation: A bed or deposit composed throughout of substantially the same kinds of rock; a lithologic unit. Each different formation is given a name, frequently as a result of the study of the formation outcrop at the surface and sometimes based on fossils found in the formation.

Formation Water: The water in place in a formation at the time production commences.

Fracturing: A method of stimulating production by increasing the permeability of the producing formation. Under hydraulic pressure, a fluid is pumped down the well and out into the formation. The fluid enters the formation and parts or fractures it.

Fracturing Fluids: The fluids used to hydraulically fracture a rock formation.

G

Gas Plant: A plant for the processing of natural gas, by other than solely mechanical means, for the extraction of natural gas liquids, and/or the fractionation of the liquids into natural gas liquid products such as ethane, butane, propane and natural gasoline.

Groundwater: Water below the land surface where there is sufficient water present to completely saturate the soil or rock.

H

Hydrocarbon: Organic compound of hydrogen and carbon, whose densities, boiling points, and freezing points increase as their molecular weights increase. Although composed of only two elements, hydrocarbons exist in a variety of compounds because of the strong affinity of the carbon atom for other atoms and for itself. The smallest molecules of hydrocarbons are gaseous; the largest are solid.

I

Ignitability (RCRA): The hazardous characteristic of ignitability for purposes of RCRA is defined in 40 CFR 261.21 and is generally a liquid with a flash point less than 140 degrees F., a non-liquid that causes fire under a friction condition, an ignitable compressed gas, or is an oxidizer.

L

Lease: A legal document executed between a landowner, or a lessor, and a company or individual, as lessee, that grants the right to exploit the premises for minerals or other products. The area where production wells, stock tanks, separators, and production equipment are located.

Liner: Continuous layer of natural or synthetic materials, beneath and on the sides of a surface impoundment, landfill, or landfill cell, which restricts the downward or lateral escape of waste, waste constituents, or leachate.

Loading Criteria: A numeric level, normally expressed in pounds per acre, below which a specific chemical compound may be applied to the soil.

Location: Place at which a well is to be or has been drilled.

M

Molecular Sieve: Adsorbents that are used to remove small amounts of H_2S and/or water from natural gas, capable of being regenerated.

N

Natural Gas: Naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the earth's surface. The principal hydrocarbon constituent is methane.

Naturally Occurring Radioactive Material (NORM): Any nuclide which is radioactive in its natural physical state (i.e., not man-made), but does not include source or special nuclear material.

O

Oil Base Muds: A drilling fluid that is a water-oil emulsion with oil as the continuous phase. The oil content ranges from 50-98% oil. Oil muds are used to reduce drilling torque and to stabilize reactive shales that impede the drilling process.

Operator: The person or company, either proprietor, contractor or lessee, actually operating a well, lease or disposal facility.

P

Permeability: The ability of a formation to transmit fluids.

pH: A measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity.

Plug and Abandon (P&A, or Plugging): The placement of a plug(s) into a well designed to restrict the movement of fluids after abandonment.

Produced Sand: The formation solids which flow into the wellbore with the produced formation fluids. In general, the lower the formation competency, the greater the produced sand volumes.

Produced Water: The fluid brought up from the hydrocarbon-bearing strata during the extraction or oil and gas. It can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process.

Production: The phase of the petroleum industry that deals with bringing the well fluids to the surface and separating them and with storing, gauging, and otherwise preparing the product for sale.

R

RCRA: The Resource Conservation and Recovery Act of 1976, as amended.

Reactivity (RCRA): The hazardous characteristic of reactivity for purposes of RCRA is defined in 40 CFR 261.23 and generally includes wastes with highly exothermic reactions or wastes which create toxic gases when mixed with water.

Reclamation: The process of returning a facility's site or contaminated soil back to its pre-operation or uncontaminated state.

Reservoir: A subsurface, porous, permeable rock body in which oil or gas or both are stored. Most reservoir rocks are limestones, dolomites, sandstones, of a combination or these. The three basic types of hydrocarbon reservoirs are oil, gas, and condensate. An oil reservoir generally contains three fluids - gas, oil, and water-with-oil, the dominant product. In the typical oil reservoir, these fluids occur in different phases because of the variance in their gravities. Gas, the lightest, occupies the upper part of the reservoir rocks; water, the lower part; and oil, the intermediate section. In addition to occurring as a cap or in solution, gas may accumulate independently of the oil; if so, the reservoir is called a gas reservoir. Associated with the gas, in most instances, are salt water and some oil. In a condensate reservoir, the hydrocarbons may exist as a gas, but when brought to the surface, some of the heavier ones condense to a liquid or condensate. At the surface the hydrocarbons from a condensate reservoir consist of gas and a high-gravity crude (i.e., the condensate). Condensate wells are sometimes called gas-condensate reservoirs.

S

Salinity: The quantitative level of salt in an aqueous medium.

Salt Section: A formation, or part of a formation, which is predominantly made-up of salt; typically sodium chloride.

Sodium Absorption Ratio (SAR): A ratio of the concentration of sodium to the square root of the sum of the concentrations of calcium and magnesium.

$$SAR = \frac{Na+}{\sqrt{[Ca^{+} + Mg^{2+}]}}$$

Where the cation concentrations are in millimoles per liter. It is a measurement frequently used in soil analysis to evaluate a soil's ability to sustain plant growth.

Solids Separation Equipment: Equipment used in drilling and workover/completion operations to remove drill cutting or formation solids from the drilling or workover/completion fluid. May include liquid/solids separation devices such as shale shakers, hydrocyclones, centrifuges and filtration units.

Stripper Well: A well nearing depletion that produces a small volume of oil or gas.

Subtitle C: That portion of the Resource Conservation and Recovery Act (RCRA) which defines and legislates the management of hazardous wastes; a designation for hazardous solid wastes as defined by RCRA.

T

Tank Bottoms: Produced sand, formation solids, and/or emulsions that settle-out in production operation process vessels.

Topography: The physical features of a district or region, such as are represented on maps, taken collectively; especially the relief and contour of the land.

Toxicity Characteristic (RCRA): The hazardous characteristic of toxicity for purposes of RCRA is defined in 40 CFR 261.24 and includes eight metal and thirty-one organic compounds. The toxicity characteristic is determined by analysis of the extract from a prescribed test procedure.

U

Underground Source of Drinking Water (USDW): An aquifer which supplies drinking water for human consumption or for any public water system, or contains fewer than 10,000 mg per liter total dissolved solids, and does not contain minerals or hydrocarbons that are commercially producible, and is situated at a depth or location which makes the recovery of water for drinking water purposes economically or technologically practical. While EPA defines an USDW as containing less than 10,000 mg per liter TDS,

certain states, such as California and Texas, have adopted a 3,000 mg per liter TDS definition for the Class II UIC injection well programs.

V

Vadose Zone: A subsurface soil zone that contains suspended water. The vadose zone is above the zone of continuous water saturation.

W

Waterflood: A method used to enhance oil recovery in which water is injected into a reservoir to remove additional quantities of oil that have been left behind after primary recovery. Usually, a waterflood involves the injection of water through wells specially designed and/or placed for water injection. The injected water sweeps through the oil formation and moves remaining oil to the producing wells.

Workover: One or more of a variety of remedial operations performed on a producing well to try to increase production. Examples of workover operations are deepening, plugging back, pulling and resetting the liner, squeeze-cementing, etc.

Workover Fluid: A special fluid used to keep a well under control when it is being worked over. A workover fluid is composed carefully so it will not cause formation damage.

Workover Wastes: Wastes resulting from well workover operations. The wastes usually include workover fluids, similar to drilling fluids, and could include various small volume wastes such as tubing scale, wax/paraffin, and cleaning or painting wastes.

APPENDIX B

STATE SUMMARIES

STATE: Alabama

AGENCIES: State Oil and Gas Board (OGB)
Department of Environmental Management (DEM)

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (OGB-DEM) - Permitted for reserve pit wastes with limit of 500 mg/l Cl.
Roadspreading - (OGB-DEM) -
Pits - (OGB) - Reserve pits permitted (no pits allowed in coastal wetlands). No testing prior to closure.
Surface water discharge - (DEM) -
Waste haulers - (OGB) -
Burial or landfill - (OGB-DEM) -
EOR/injection wells - (OGB) - Standard method of disposal of produced water. Permitted method of reserve pit waste.

BONDING: Compliance bond required. Bond is conditioned upon compliance with the Rules and Regulations and proper plugging. Bond amount per well depends on depth of well and ranges from $5,000 to $50,000 onshore and from $100,000 to $500,000 offshore. Blanket bonds are $100,000 onshore and $1,000,000 offshore.

ENFORCEMENT: Shut-in of wells or facilities. Revocation of Certificates to transport oil and/or gas production. Supervisor's Conference may result in fines and/or referral for Board action at public meeting. Public meeting of Board may result in imposition of fines, forfeiture of bond, and/or referral to Attorney General.

COMMENTS: Permit drilling mud treatment/recycling.
Record keeping requirements?

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Alabama

Forms completed by: Ed Hughes

Agency: Alabama Department of Environmental Management (DEM)
Phone: (205) 271-7700

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: State Oil & Gas Board (OGB)
DEM

Off-site disposal: State Oil & Gas Board (OGB)
DEM

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

State Oil & Gas Board is the lead agency for the UIC program. The majority of oil and gas wastes in the state are disposed under this program.

The Board & DEM operate under a memorandum of agreement.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Alabama

Forms completed by: Richard N. Raymond

Agency: State Oil & Gas Board (OGB)

Phone: (205) 349-2852

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: State Oil & Gas Board (OGB)
DEM

Off-site disposal: State Oil & Gas Board (OGB)
DEM

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

DEM has been designated by the Governor of Alabama as the lead State agency to receive Federal grant funds pursuant to state administration of the Underground Injection Control Program (UICP). By memorandum of agreement (MOA), the EPA has awarded the OGB primacy to administer Alabama's Class II UICP. Therefore, Federal grant funds for the UICP in Alabama are received by DEM; funds allocated to administer Alabama's Class II UICP are transferred from DEM to OGB via MOA.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

2. Legal support; and

3. Permitting, siting, and administration.

In view of the organization of DEM's budget, it is difficult to provide monetary amount for the requested categories.

Please indicate, for each agency above, what type of training is needed for your staff.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

For discharges of produced water from coalbed methane operations, permit limits are presently based on an instream chloride concentration of 230 mg/l instead of a TDS limit of 600 mg/l.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for: SOGB FY 1988-89.

1. Enforcement, field monitoring and inspection;

   14.5 full time equivalency totaling $596,916

2. Legal support; and

   4.9 full time equivalency totaling $165,124

3. Permitting, siting, and administration.

   32.7 full time equivalency totaling $1,649,169

Please indicate, for each agency above, what type of training is needed for your staff.

The OGB staff is composed of geologists, engineers, attorneys, and technical support and clerical personnel. Due to the diversity of required talents to fulfill the OGB's responsibilities, specific individual training needs are varied and will not be elaborated on. However, it can be said that personnel with the OGB receive on-the-job training. The intensity and type of training depends on the individual's expertise and familiarity with the requirements of the position he/she fills. On-the-job training continues throughout the career of an OGB employee due to exposure to new techniques and equipment. Hands on experience with proper direction, supplemented by schools and seminars, has been the most important training tool available to the OGB staff. It is anticipated that training needs for the OGB staff will continue to be satisfied in this manner.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	OGB & DEM	DEM
b.	Roadspreading	OGB & DEM	
c.	Pits	OGB	
d.	Surface water disposal	DEM	
e.	Waste haulers	OGB	OGB
f.	Burial or landfill		DEM
g.	Disposal wells	OGB	
h.	Enhanced oil recovery injection wells	OGB	

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OGB	OGB
b.	Clean Water Act (NPDES)	DEM	
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEM	DEM
	Subpart D (Non-Hazardous)	DEM	DEM

3. List any financial assurance requirements for oil and gas exploration and production wastes:

DEM - none

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

DEM - Enforcement action is initiated through administrative proceedings.

Please list the types of enforcement actions available?

Administrative Orders
Litigation

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	OGB	DEM
b.	Roadspreading	OGB	
c.	Pits	OGB	DEM
d.	Surface water disposal	DEM	DEM
e.	Waste haulers	OGB	OGB
f.	Burial or landfill	OGB	DEM
g.	Disposal wells	OGB	OGB
h.	Enhanced oil recovery injection wells	OGB	OGB

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OGB	OGB
b.	Clean Water Act (NPDES)	DEM	
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEM	DEM
	Subpart D (Non-Hazardous)	DEM	DEM

3. List any financial assurance requirements for oil and gas exploration and production wastes:

1. Before any person or persons shall hereafter begin the drilling, operation, or production of any well in search of or in production of oil or gas in the State of Alabama, or in continuing such drilling, operation, or production said person(s) shall file with the Board or the Supervisor a bond on Form OGB-3 in an amount as hereinafter set forth, in accordance with the rules, regulations, and orders of the Board and with the laws of the State of Alabama. Such bond shall be payable to the State of Alabama for each such well, executed by such person(s) as principal, and by some surety, approved by the Board or by the Supervisor, continued that, if such well is drilling, such person(s) shall, in connection with the drilling, operating, or production of such well, prevent the escape of oil or gas out of one stratum to another, prevent waste, prevent the intrusion of water into any oil or gas stratum from a separate stratum, prevent the pollution of the sea, prevent pollution of all surface and ground water and prevent the pollution of fresh-water supplies by oil, gas, salt water, or any other substance; conditioned also that such person(s) shall make all reports required by the Board or by the Supervisor in his reasonable discretion, or by these rules and regulations, including all logs, if taken, and drilling records, and shall file in the office of the Supervisor typical drill cuttings and cores or core chips, if cores are taken, within six (6) months from the time of completion of said well; also conditioned that such person(s) shall drill, operate, produce, and plug said well in compliance with all lawful rules, regulations, and orders of the Board now existing or hereafter promulgated, and with the laws of the State of Alabama now existing of hereafter enacted, and in the event said well does not produce oil or gas in commercially profitable quantities or ceases to produce oil or gas in commercially profitable quantities or if the operations of such well shall cease for a period of six (6) months or if such well should become dangerous to the public, such person(s) shall properly plug such well in accordance with Rule 400-1-3-06 unless otherwise ordered by the Board. The amount of such bond to be in accordance with the following relationship of footage:

Depth in feet	Amount of bond required
0 - 5,000	$ 5,000
5,001 - 10,000	10,000
10,001 - 15,000	15,000
15,001 - 20,000	30,000
20,001 or more	50,000

Provided, further, the Board, in its reasonable discretion for good cause, after notice and hearing, may require a different amount of bond because of environmentally sensitive conditions at the drill site or for other justifiable reasons for good cause and may deem and determine any existing bond to be inadequate and may require the filing of a new and different bond or an appropriate amendment or addendum to a previously filed bond, as shall be approved by the Board or Supervisor, upon the Board's own motion or upon petition by any party allowed to file a petition by these rules and regulations, and the amount of such bond required may be more or less than hereinabove set forth, the hearing upon such matter to be conducted in the same manner as any other hearing before the Board. The provisions of this rule shall apply to presently existing wells and bonds, as well as to those that shall or may come into being hereafter.

2. Any such bond filed with the Board, including any amendment or addendum thereto, must set forth the correct legal name and address of the principal and the surety thereto and must be countersigned by an Alabama agent of such surety, setting forth the correct legal name of such agent and such agent's company affiliation and correct business address.

3. Provided further, however, the Board may allow the filing of a blanket bond by an operator in the amount of One Hundred Thousand Dollars ($100,000.00) on Form OGB-4. The Board, after notice and hearing, may in its reasonable discretion for justifiable and good cause, require the filing of a new blanket bond of a different amount superseding any previous order by the Board regarding a blanket bond, and any blanket bond shall require and have the same requirements as set forth hereinabove for single well bonds except that blanket bonds may apply to more than one well and the amount of such blanket bond may not be required to be in accordance with the aforesaid relationship of footage.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

OGB and DEM have separate policies that govern their enforcement processes. The OGB generally handles enforcement actions for minor violations at the field level. Major violations may require a Supervisor's Conference. The Supervisor's Conference provides the operator an opportunity to discuss the alleged violation(s). Based on the results of the conference, the Supervisor may make a recommendation to the Board members that the operator be fined. If fined, the operator has the option of paying the fine or being heard by the Board at a public meeting. Serious violations may be heard by the Board followed by possible referral to the state attorney general. The Board's attorney is an assistant attorney general, therefore, violations are generally handled by the Board and its staff.

Please list the types of enforcement actions available?

1. Shut in of wells and facilities which may include revocation of certificates to transport oil and/or gas production.

2. Supervisor's Conference that may result in recommendation of fines and/or referral of enforcement actions to Board members at a public meeting.

3. Public meeting with Board members that may result in the imposition of fines, foreclosure of bond proceeds, and/or possible referral to state attorney general.

ALABAMA

INTRODUCTION

Alabama produced 9,618,183 barrels of oil, 11,108,880 barrels of condensate, and approximately 177 x 10^9 cubic feet of gas in 1988. Production was from 897 oil wells, 750 conventional gas wells, and 514 coalbed methane wells.

Alabama began limited regulation of oil and gas activities in 1945. Regulations for disposal of drilling wastes were adopted in 1973. Regulations and/or administrative codes have been revised continually over the past 40 years.

REGULATORY AGENCIES

Four agencies regulate oil and gas activity in Alabama. They are:

* Alabama State Oil and Gas Board;
* Alabama Department of Environmental Management;
* U.S. Bureau of Land Management; and
* U.S. Army Corps of Engineers.

The Alabama State Oil and Gas Board is "charged with preventing the waste of Alabama's oil and gas resources and protecting the correlative rights of owners." In carrying out its mandate, the Board regulates all oil and gas operations, from the issuance of drilling permits through the production phase. The Oil and Gas Board has the authority to issue permits for Underground Injection Control (UIC) Class II wells. The various permitting requirements and conditions of the Oil and Gas Board are detailed in the Board's Administrative Code.

The Alabama Department of Environmental Management (DEM) has the authority to issue permits for all UIC wells other than Class II. The Department of Environmental Management also has National Pollutant Discharge Elimination System (NPDES) authority. The Oil and Gas Board and the Department of Environmental Management operate under a 1979 Memorandum of Agreement that requires the Board to forward information regarding actual or proposed discharges to the Department of Environmental Management.

The U.S. Bureau of Land Management's authority and regulations for Federally-held mineral rights are discussed separately in the section on Federal agencies. (See Volume 1, Chapter VII.) The U.S. Forest Service retains surface rights (and usually coordinates stipulations with the Bureau of Land Management) in Federal forests and grasslands.

STATE RULES AND REGULATIONS

Drilling

The Oil and Gas Board requires that drilling pits be constructed and maintained to prevent pollution of surface and ground water. Prior to utilizing a drill pit, such pit shall be inspected by a qualified engineer who shall make a determination that said pit is constructed in a manner that will prevent the pollution of surface and ground water.

No pits are permitted in Alabama's coastal wetlands. The Department of Environmental Management prohibits the use of pits in wetlands in order to ensure the protection of surface or ground-water resources. Many of the wetland areas in Alabama fall within the jurisdiction of the Alabama Coastal Area Management Program, which is enforced by DEM. The Certificate of Consistency, which must be issued by DEM before a permit can be granted by the Board, requires use of portable aboveground tanks for any well drilled in the coastal area.

Drilling muds and pit fluids may be disposed of in one of three ways. They may be injected into a formation below underground sources of drinking water. They may be transported to a drilling mud treatment (recycling) facility. In non-wetlands, the fluids may be applied to the land surface or into a landfill if approved by DEM.

Production Waters

Class II injection wells are used for (1) the disposal of waters produced in association with oil and/or natural gas, (2) the disposal of nonhazardous wastewaters that may be generated during the operation of a gas plant, (3) the enhanced recovery of oil or natural gas, or (4) the storage of liquid hydrocarbons at standard temperature and pressure. Currently, all of Alabama's 248 Class II injection wells are permitted for disposal purposes or for the enhancement of oil or natural gas production.

According to Rule 400-1-5.04, "Immediately following the initiation of production in any field or pool, all salt water shall be disposed of into an approved underground formation or otherwise disposed of as approved by the Supervisor where such salt water cannot damage or pollute underground sources of drinking water, oil, gas or other minerals." The permitting of Class II injection wells in Alabama is a two-step process. Step 1, obtaining approval to drill or convert a well for injection purposes, includes a review of all well construction within a one-quarter mile radius of the proposed injection well, along with the submission of data concerning the construction of the proposed injection well, analyses and estimated volumes of fluids to be injected, anticipated injection pressures, known or calculated fracture pressure of the proposed injection interval, and the lowermost depth of fresh water. All injections will be made through tubing anchored by a packer unless otherwise approved by the Oil and Gas Supervisor. In addition, the operator must provide proof that the injection casing is adequately cemented in order to prevent vertical fluid migration, and must test the injection casing at a pressure equal to two-tenths of the depth of the mid-point of the injection interval, but not to exceed 1,500 psi.

Following completions of the Board's Step 1 requirements, the applicant may receive approval to start injection. Once injection begins, the operator must submit monthly reports on injection volumes, injection pressures, and the casing-tubing annulus pressures. The injection pressure and the casing-tubing annulus pressure must be recorded daily or computed on an average daily basis from weekly measurements. Also, chemical analyses of injected fluids must be submitted on an annual basis, and a pressure test should be performed at least once every 5 years.

Produced waters from coalbed methane wells are an exception to the injection requirement. EPA has advised Alabama that coalbed methane production is not covered under the Federal onshore oil and gas regulations. Produced waters from coalbed methane wells may be allowed to accumulate in pits and settle. They would then be discharged directly into live streams. The Department of Environmental Management stipulates that operators must obtain permits for such discharges and requires that such discharges meet a 230 parts per million chloride in-stream limit.

Plugging/Abandonment

Plugging is required after 6 months of non-use, but wells may be approved for temporary abandonment if future utility can be shown. Thereafter, well status must be reported and temporary abandoned status renewed every 6 months.

When plugging, cement plugs of not less than 200 feet should be placed above any producing formation, from 10 feet below to 100 feet above the base of freshwater strata, and from 100 feet below to 100 feet above the base of the surface casing. A 25-foot plug should be near the surface and a steel plate should be placed over the casing stub. Intervals between the plugs must be filled with mud-laden fluid.

References

State Oil and Gas Board of Alabama. Submittal to EPA regarding Onshore Oil and Gas Subcategory, March 1985.

_____. Administrative Code. General Order Prescribing Rules and Regulations Governing the Conservation of Oil and Gas in Alabama and Oil and Gas Laws of Alabama with Oil and Gas Board Forms, Oil and Gas Report 1, 1983.

USEPA. 1985. U.S. Environmental Protection Agency. Alabama Meeting Report. Proceedings of the Onshore Oil and Gas Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communication:

Treena Pizner, Alabama Department of Environmental Management (205) 271-7850.

Ed Hughes, Alabama Department of Environmental Management (205) 271-7838.

STATE: Alaska

AGENCIES: Oil and Gas Conservation Commission (AOGCC)
* Department of Environmental Conservation (DEC)
Department of Natural Resources (DNR)
Department of Fish and Game (ADFG)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Reserve pit fluids discharged to tundra under general permit.
Roadspreading - Permits road application of reserve pit fluids for dust control.
Pits - Reserve pits regulated by permit. Liners required for some pits. Closure requirements in place.
Surface water discharge - Does not have NPDES primacy.
Waste haulers -
Burial or landfill - Burial on-site or off-site requires permit.
EOR/injection wells - UIC primacy state. General permit for injection of reserve pit fluids. Produced fluids are injected for disposal or enhanced recovery.

BONDING: Compliance bond required. Bond is conditioned that it be underwritten by a corporate surety authorized to do business in Alaska, or a certificate of deposit issued in sole favor of the Alaska Oil and Gas Conservation Commission from a bank authorized to do business in Alaska. Bond amount is $100,000 per well or $200,000 blanket bond.

ENFORCEMENT: Administrative procedures, including penalties and injunctions are available through the Attorney General.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Alaska

Forms completed by: Blair E. Wondzell

Agency: Alaska Oil & Gas Conservation Commission (AOGCC)
Phone: (907) 279-1433

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

The Division of Environmental Quality, within the Alaska Department of Environmental Conservation (DEC), regulates oil and gas exploration and production waste management and disposal practices both on-site and off-site. Solid waste and wastewater requirements are most often involved with these wastes, although hazardous waste rules also are applicable in some instances, consistent with EPA's interpretation of the oil and gas exclusion.

Within the Alaska Department of Natural Resources (DNR), the Division of Land and Water Management is responsible for management of the state's uplands, tidelands, shorelands, and waters. The Division approves the surface use of oil and gas leases for waste management and disposal activities. In addition, the Division manages surface-use leases of state lands, not part of oil and gas leases, for activities such as waste management and disposal, that may be conducted in connection with oil and gas exploration and production.

The Alaska Department of Transportation and Public Facilities (ADOT/PF) has responsibility for the management of certain lands in the vicinity of state airports. In the vicinity of the Deadhorse Airport, on Alaska's North Slope, surface-use lease have been made to oilfield service companies.

The Alaska Oil and Gas Conservation Commission (AOGCC) regulates Class II underground injection wells in the state. AOGCC also must approve the use of well casings for disposal of drilling fluids by annular injection. AOGCC regulations require the use of reseve pits in drilling operations and require reserve pits to be left in a condition that does not constitute a hazard to ground water.

The Alaska Department of Fish and Game (ADFG), Division of Habitat, issues permits for activities that affect anadromous fish streams, activities that would obstruct fish passage in any fish-bearing waters, and activities that occur in certain legislatively designated special areas.

The Office of the Governor, Division of Governmental Coordination (DGC), administers the Alaska Coastal Zone Management Program. The program requires DGC to determine whether proposed activities that occur in the state's coastal zone and require either a federal permit or more than one state permit are consistent with the State's or an approved district's coastal management plan.

Local governments can exert some jurisdiction over oil and gas exploration and production waste management and disposal through local planning and zoning or other local permitting authorities.

EPA maintains primary responsibility for the administration of the RCRA hazardous waste, NPDES and UIC (except Class II wells) programs in Alaska. Other federal, land management agencies, including the Bureau of Land Management, National Park Service, Fish and Wildlife Service, and Forest Service have land-use authority on lands under their jurisdiction.

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Cases of direct dual jurisdiction among government agencies in Alaska is rare. Generally, public land management agencies and local governments have authority to approve the use of lands under their jurisdictions and DEC is responsible for approving and ensuring that waste management operations are conducted in a manner that protects public health and the environment. In addition, the Alaska Coastal Management Program serves to coordinate multiple agency actions in coastal zone areas.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   DEC devotes approximately 600 mandays (3 full-time equivalents or FTEs) statewide to the enforcement, field monitoring, and inspection of oil and gas exploration and production waste management and disposal operations. This includes approximately 2 FTE for North Slope and 1 FTE for Kenai Peninsula area operations. The agency's budget for this effort is approximately $210,000 per year.

   DNR devotes approximately 1.25 FTEs statewide to the enforcement, field monitoring, and inspection of oil and gas exploration and production waste management and disposal operations. The agency's budget for this effort is approximately $88,000 per year.

   ADFG devotes approximately 1.5 FTEs statewide to the enforcement, field monitoring, and inspection of oil and gas exploration and production waste management and disposal operations. The agency's budget for this effort is approximately $105,000 per year.

   AOGCC reported that the agency devotes no staff or budget to enforcement, field monitoring, and inspection of oil and gas exploration and production waste management and disposal operations.

   DGC devotes no staff effort and no budget to the enforcement, field monitoring, and inspection of oil and gas exploration and production waste management and disposal operations. Funds to carry out these activities are provided to DEC, DNR and ADFG.

2. Legal support; and

   There is no set level of dedicated legal support within the Alaska Department of Law to other state agencies for matters concerning oil and gas exploration and production waste management and disposal operations. In general, I estimate that less than 1 FTE of legal support statewide is provided each year. However, higher levels of legal support usually can be obtained as needed.

3. Permitting, siting, and administration.

DEC devotes approximately 2.5 FTEs statewide to the permitting, siting, and administration of oil and gas exploration and production waste management and disposal operations. This includes approximately 1.8 FTE for North Slope and .7 FTE for Kenai Peninsula area operations. The agency's budget for this effort is approximately $175,000 per year.

DNR devotes approximately .75 FTEs statewide to the permitting, siting, and administration of oil and gas exploration and production waste management and disposal operations. The agency's budget for this effort is approximately $53,000 per year.

ADFG devotes approximately 2 FTEs statewide to the permitting, siting, and administration of oil and gas exploration and production waste management and disposal operations. The agency's budget for this effort is approximately $140,000 per year.

AOGCC reported that the agency devotes no staff or budget to the permitting, siting, and administration of oil and gas exploration and production waste management and disposal operations.

DGC devotes approximately 1.8 FTEs and $120,000 budget to the permitting, siting, and administration of oil and gas exploration and production waste management and disposal operations.

Please indicate, for each agency above, what type of training is needed for your staff.

DEC and DNR staff listed the following types of training applicable to oil and gas exploration and production waste management and disposal:

* Oil and gas waste management conferences
* Oil and hazardous substance spill response
* Drilling and well maintenance practices
* Oil production practices
* Identification of wastes and their characteristics
* Material use and safety
* Waste management liability issues for land managers
* Site inspection procedures

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DNR/ADEC	DNR/ADEC
b.	Roadspreading	ADEC	ADEC
c.	Pits	AOGCC/DNR/ADEC	AOGCC/DNR/ADEC
d.	Surface water disposal	EPA/ADEC	EPA/ADEC
e.	Waste haulers	n/a	n/a
f.	Burial or landfill	DNR/ADEC	DNR/ADEC
g.	Disposal wells	AOGCC/EPA/ADEC	AOGCC/EPA/ADEC
h.	Enhanced oil recovery injection wells	AOGCC	AOGCC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	AOGCC/EPA	AOGCC/EPA
b.	Clean Water Act (NPDES)	EPA	EPA
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	EPA	EPA
	Subpart D (Non-Hazardous)	ADEC	ADEC

3. List any financial assurance requirements for oil and gas exploration and production wastes:

DNR can require a bond of $10,000 or more to be posted in connection with surface-use land leases. DNR also can waive the bonding requirement.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

DEC: Enforcement is agency-initiated, but agency is represented by Attorney General or District Attorney
DNR: Enforcement is agency-initiated, but agency is represented by Attorney General or District Attorney
ADFG: Enforcement is agency-initiated, but agency is represented by Attorney General or District Attorney
AOGCC: Enforcement is agency-initiated, but agency is represented by Attorney General or District Attorney

Please list the types of enforcement actions available?

DEC: Administration (Notice of Violation, Compliance Order, and Emergency Order)
Court injunction
Civil complaint
Criminal complaint

DNR: Administrative (Notice of Violation, Revocation of lease or bond)
Court injunction
Civil complaint
Criminal complaint

ADFG: Administrative (Notice of Violation)
Court injection
Civil complaint
Criminal complaint

AOGCC: Civil complaint
Court injunctions

ALASKA

INTRODUCTION

Alaska produced 758,426,550 barrels of oil and natural gas liquids (NGLs) and 1,953 x 10^9 cubic feet of gas; 707,713,314 barrels of water and 1,548 x 10^9 cubic feet of gas were injected into producing formations for enhanced oil recovery.

Alaska ranked second in U.S. oil production, but 22nd in the number of production wells (1,216); and first in reserves (7,378 x 10^6 bbls), 27% of U.S. total. It ranked eighth in U.S. gas production, 15th in the number of producing gas wells (108), and second in gas reserves (33,225 BCF), 18% of U.S. total.

Oil and gas in Alaska were produced from two development regions: the South Central region (including Cook Inlet and the Kenai Peninsula) and the North Slope region. The state contains other prospective areas, but to date no discoveries have been made there.

Fields in the South Central region produced 15,891,553 barrels of oil and 298 x 10^9 cubic feet of gas. Approximately 743,034,997 barrels of oil and NGLs and 1,654 x 10^9 cubic feet of gas were produced from three fields in the North Slope: Kuparuk, Endicott, and Prodhoe.

REGULATORY AGENCIES

The eight agencies that regulate oil and gas activities in Alaska are:

* Alaska Oil and Gas Convservation Commission;
* Alaska Department of Environmental Conservation;
* U.S. Bureau of Land Management;
* Alaska Department of Natural Resources;
* Alaska Department of Fish and Game;
* U.S. Army Corps of Engineers;
* U.S. EPA Region X; and
* U.S. Fish and Wildlife Service.

The Alaska Oil and Gas Conservation Commission (AOGCC) regulates the production and conservation of oil and gas in Alaska on all lands subject to its police powers, and is responsible for issuing permits to drill. The Commission checks well casing to prevent contamination of water and has primacy for the Class II injection wells. Under Title 31 of the Alaska Statutes, the Commission has the status of an independent quasi-judicial agency. Its three commissioners, appointed by the Governor, must include an expert in petroleum engineering and an expert in petroleum geology.

The Alaska Department of Environmental Conservation (DEC) is the primary pollution control agency within the State government. The Department regulates and permits solid waste disposal, wastewater discharges, and air contaminant emissions. It issues State discharge permits for oil and gas drilling and production operations. The Department also regulates hazardous wastes, oil spill control, and the subsurface disposal of nonhazardous oil and gas wastes (which are not regulated as Class II wastes). Since Alaska does not have responsibility for the NPDES program, DEC coordinates with EPA Region X, which administers the NPDES program in Alaska.

The U.S. Bureau of Land Management is responsible for all oil and gas activity on Federal and Indian lands (under 43 CFR 3160). There are 370 million acres of land in Alaska of which more than half are under Federal ownership. There are approximately 50 producing oil and gas wells on Federal leases. Regulatory processes for oil and gas operations, in addition to AOGCC's regulations, are covered in the Onshore Oil and Gas Order No. 1. More information on BLM regulations can be found in the section on Federal programs (See Vol. 1, Chapter VII)

The Alaska Department of Natural Resources (DNR) issues surface and subsurface oil and gas leases on State land. Leasing stipulations address environmental concerns, such as requiring that reserve pits be rendered impermeable, at lease award. The Department also approves plans on operation for all oil and gas activity on State lands. The approval letter contains site-specific stipulations developed through inter-agency review. In addition, the Department conducts field inspections of surface operations and abandonments on State lands.

Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers is responsible for issuing permits for dredge and fill activities on wetlands defined as part of the waters of the United States, and U.S. EPA has review responsibility for such permits. Several other State and Federal gencies also have comment and/or concurrence responsibilities on the Federal permits. Since much of Alaska's drilling and production activity, including that on the North Slope, takes place on wetlands, all pads, roads, and facilities have 404 permits. The Corps of Engineers requires all reserve pits to be rendered impermeable.

The U.S. Fish and Wildlife Service, in addition to having comment responsibility on 404 permits, has been conducting research related to the permitted discharge of drilling fluids to the tundra wetlands. The research project currently in progress is designed to determine the deleterious effect of the discharge on wildlife in the wetlands, especially to waterfowl.

STATE RULES AND REGULATIONS

New revisions to the regulations for the handling of drilling and production wastes (18 AAC 60) in Alaska were adopted by the Department of Environmental Conservation in June 1987. These amendments impose more stringent requirements on the management of reserve pits and drilling wastes.

Reserve Pits (DEC and AOGCC)

The management and disposal of drilling wastes primarily involve the proper operation and closure of the reserve pit used during drilling operations. The reserve pit often provides the permanent disposal site for solids of solidified wastes from the drilling operation. Although in exploratory drilling, reserve pits may often be used and closed in a single season, on the North Slope many are in continuous use because of the directional drilling of multiple wells from a single pad. There are, however, a variety of ways in which drilling wastes are ultimately disposed of, such as subsurface injection. (In 18 AAC 60.910, "drilling wastes" are defined as including "drilling muds, cuttings, hydrocarbons, brine, acid, sand, and emulsions of mixtures of fluids produced from and unique to the operation or maintenance of a well.")

State statutes require permits for solid waste disposal facilities; however, prior to 1982, few solid waste permits were issued for reserve pits. As early as 1982, it became policy to require permits for all currently active and new pits in the Cook Inlet area. The same policy was applied on the North Slope beginning in 1985.

Under 20 AAC 25.047, administered by the AOGCC, reserve pits are required "for the retention and confinement of drilling fluids and cuttings, to facilitate the safety of the drilling operation, and to prevent contamination of ground water and damage to the surface environment." The general construction requirement is that the pits must be rendered "impervious."

The new DEC regulations impose specific construction and performance requirements for reserve pits. The particular requirements depend on factors such as the proximity of surface water or ground water that is used for drinking water, the proximity of an existing or developing population, and whether the pit is being built in an area of continuous permafrost. For example, a reserve pit being constructed in a nonpermafrost region within 100 feet of a surface water body used for drinking water would require a double liner, leachate collection (if there is no fluid management plan), site inspection, and monitoring. A reserve pit in a permafrost region not adjacent to water supplies or population would require a containment structure (possibly lined) designed to prevent the escape of wastes from the reserve pit, site inspection, a fluid management plan, and monitoring.

Under 20 AAC 25.047, administered by the AOGCC, upon termination of operations related to a particular reserve pit, "the operator shall proceed with diligence to dispose of or solidify in place all pumpable fluids, and shall leave the reserve pit in a condition that does not constitute a hazard to ground water." Under 18 AAC 60 and 18 AAC 72, administered by the DEC, solid waste permits are required for closure and wastewater permits are needed for all discharges. Pits must be closed within 12 months after the final drilling wastes have been disposed of in the pit.

Disposal from Reserve Pits (DEC & AOGCC)

DEC tundra discharge and roadspreading permits were issued last in 1987. Both practices have been discontinued, although EPA now is processing an area wide NPDES application for the discharge of reserve pit fluids.

Surface Discharge to Road Permits (DEC)

This disposal practice for reserve pit fluids has been discontinued since 1987, because discharges could not meet the state water quality standards.

Annular Disposal Permits (DEC)

Reserve pit wastes are frequently injected down the annulus either of the well being drilled or of another well on the pad. A general permit for annular disposal for the North Slope was issued by DEC for the period of August 6, 1985, to April 30, 1987. The permit applies to the discharge of "fluids produced from the drilling, servicing or testing of oil and gas exploration, development, service and stratigraphic test wells, including but not limited to drilling fluids, rig washwater, completion fluids, formation fluids, reserve pit meltwaters and domestic wastewaters..."

Discharge must occur below the permafrost zone; the minimum depth must be 1,000 feet. No discharge must be into any zone containing total dissolved solids (TDS) of less than 3,000 ppm. Operators must notify DEC at least 2 weeks before beginning injection, and must include information on volumes and types of material being injected, the zone and depth of the injection, and the method to be used to seal the injection zone at the completion of disposal. Written approval must be received from DEC. A report must be submitted after closure of the well, stating volumes and types of liquids injection, well location, well designations, date and time of injections, and depth of injection zones.

This option may require that the operator perform annual maintenance on the well to preserve the permafrost.

Injection and Disposal Wells (AOGCC)

The Oil and Gas Conservation Commission has responsibility for Class II UIC wells. The Commission permits the disposal of both oil field waste fluids and produced waters into wells dedicated to disposal of oil field wastes (20 AAC 25.252), and approves injection into wells for enhanced recovery (20 AAC, Article 5). While the numbers continually change, June 1989 figures are 39 disposal (2D) and 512 enhanced recovery (2R) wells for a total of 551 Class II wells.

Since more water is injected for enhanced recovery in Alaska than is produced with oil and gas production, produced waters are injected into disposal wells only when they are geographically distant from any enhanced recovery operation. Additional water for enhanced recovery is drawn from both Cook Inlet and the Arctic Ocean.

Injection for enhanced recovery may be carried out under are injection orders (20 AAC 25.460). The Commission may issue orders permitting injection on an area basis, rather than for each individual well, if the wells are essentially similar; are within the same field, site, or similar area; are operated by a single operation; and are used to inject other than hazardous waste.

Reserve pit fluids may be injected into dedicated disposal wells.

Injection wells must be cased with safe and appropriate casing, tubed to prevent leakage, and cemented to protect oil, gas, and freshwater strata. At application, information must be provided on all wells within one-quarter mile of the injection well that penetrate the injection zone. Adequate evidence must be provided to support a Commission finding that a proposed injection well will not cause or increase fractures in overlying strata or the confining zone which could allow injected or formation liquids to enter freshwater strata. (Freshwater aquifers may be exempted from the restrictions affecting them if they currently do not and cannot in the future serve as sources of drinking water; are between 3,000 and 10,000 mg/L TDS and cannot be reasonably expected to supply a public water system; or if they are at a depth or are too contaminated for economic or technologically practical recovery.)

Injection wells must be equipped with tubing and packer or other equipment that would isolate pressure to the injection interval. Wells must undergo pressure tests for mechanical integrity before operation. The test must run for 30 minutes at 1,500 psi or 0.25 psi/ft times the vertical depth of the casing shoe, whichever is greater (but must not exceed 70 percent of the minimum yield strength of the casing), with a maximum pressure decline of 10 percent. Thereafter, mechanical integrity must be demonstrated by the operator by monitoring the pressure in the casing-tubing annulus during actual injection. The monitored pressure must be reported monthly.

At present, one application is pending with the EPA for a permit for a dedicated Class I disposal well on the North Slope for the Prudhoe Bay Unit.

Plugging/Abandonment of Wells (AOGCC)

All wells that have been permitted on a property must be abandoned within 1 year following cessation of the operator's oil and as activity within the field where the wells are located. Any well that is not completed after drilling must be abandoned or suspended before the drilling equipment is removed.

The Commission may approve suspension of a well if it has future productive or service use, and if there is a justifiable reason for the suspension (e.g. unavailability of production or marketing facilities). The operator of a suspended well must set a bridge plug 200 to 300 feet below the casing head and cap with 100 linear feet of cement. Additional plugging requirements for a suspended well would be determined by the Commission on a site-specific basis.

Abandoned wells must be plugged to prevent movement of fluid into or between freshwater and hydrocarbon sources. Uncased portions of a well must be plugged with cement to keep fluids in original strata; cement plugs must be placed from 50 feet below to 100 feet above hydrocarbon strata, and from 150 feet to 50 feet above the base of the lowest freshwater stratum.

Uncased and cased portions of the wellbore must be effectively segretaed to prevent vertical movement of fluids within the well bore; various cementing method/plug placement combinations may be used (e.g., plug from 100 feet below to 100 feet above the casing shoe, using the displacement method).

Casing portions of the wellbore must be plugged with cement to confine hydrocarbons and fresh water to their original strata. Perforated intervals must be plugged by one of several methods (e.g., by extending cement plugs from 100 feet below to 50 feet above the base and from 50 feet below to 100 feet above the top of each interval, or by placing a mechanical bridge with a 75-foot cement cap 50 feet over the interval), as must casing stubs within the outer casing (plug from 100 feet above to 100 feet below the stub, bridge plug 25 feet over the stub with a 75-foot cap, or downsqueeze 150 feet of cement through the retainer with an additional 50-foot plug).

Surface plugs must seal all annular openings that are in communication with the open hole and extend to the surface; a 150 foot cement plug must extend to within 5 feet of grade elevation.

Cements used for plugging within permafrost zones must be designated to set before freezing and have low heat of hydration. Muds equaling or exceeding the density of mud used to drill each interval should fill the intervals between plugs.

Final abandonment of the wells is the responsibility of the AOGCC, while final abandonment of the drill sites must also be approved by DNR, DEC, and the Alaska Department of Fish and Game if the site is on State land.

References

Alaska Department of Environmental Conservation. General Wastewater Disposal Permits for surface discharges from reserve pits (#8640-DB001; May 12, 1986) and annular injection (#8540-DB001; August 6, 1985); and individual permits for road application (#8636-DB003 and DB004).

_____. Regulations. Alaska Administrative Code; Title 18, Chapter 60 (Solid Waste Management), September 1987; Chapter 72 (Wastewater Disposal), January 1983.

Alaska Oil and Gas Conservation Commission. 1986. Regulations. Alaska Administrative Code, Title 20, April 2, 1986.

Alaska Statutes, Title 31, Chapter 05, Alaska Oil and Gas Conservation Act.

Fristoe, Bradley R. 1985. Letter communication to EPA. State of Alaska Department of Environmental Conservation.

Interstate Oil and Gas Commission. 1986. Summary of State Statutes and Regulations for Oil and Gas Production June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Title 46, Water, Air, Energy, and Environmental Conservation: Chapters 3 (Environmental Conservation); 4 (Oil Pollution Coantrol); and 8-9 (Oil and Hazardous Substance Release).

USEPA. 1985. U.S. Environmental Protection Agency. Alaska Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

William Barnwell, Alaska Oil and Gas Conservation Commission (907) 279-1433.

Michael Frank, Alaska Attorney General's Office, Natural Resources Division (907) 276-3550.

Douglas Lowery, Alaska Department of Environmental Conservation (907) 452-1714.

Doug Redburn, Chief of Water Quality Management Section, Juneau (907) 465-2666.

Dan Wilkerson, Alaska Department of Environmental Conservation (907) 274-2533.

STATE: Arizona

AGENCIES: Oil and Gas Conservation Commission
Department of Environmental Quality
U.S. Bureau of Land Management
U.S. Bureau of Indian Affairs

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming -
Roadspreading -
Pits - Reserve pits are allowed to evaporate before closure.
Surface water discharge - Does not have NPDES primacy.
Waste haulers -
Burial or landfill -
EOR/injection wells - Does not have UIC primacy. All produced fluids are reinjected for enhanced recovery or disposal.

BONDING: Compliance bond required. Bond is conditioned for release contingent upon operator's compliance with all rules and regulations of the Commission. Bond amount is $5,000 per well or $25,000 blanket bond.

ENFORCEMENT:

COMMENTS: Returned a blank survey form. Above information gleaned from other sources.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Arizona

Forms completed by: Daniel J. Brennan

Agency: Arizona Oil & Gas Conservation Commission
Phone: (602) 255-5161

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal:

Off-site disposal:

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

2. Legal support; and

3. Permitting, siting, and administration.

Please indicate, for each agency above, what type of training is needed for your staff.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES: Disposal on-site Disposal off-site

   a. Landfarming
   b. Roadspreading
   c. Pits
   d. Surface water disposal
   e. Waste haulers
   f. Burial or landfill
   g. Disposal wells
   h. Enhanced oil recovery
      injection wells

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

   Disposal on-site Disposal off-site

   a. Safe Drinking Water Act (UIC)
   b. Clean Water Act (NPDES)
   c. Resource Conservation &
      Recovery Act (RCRA)
         Subpart C (Hazardous)
         Subpart D (Non-Hazardous)

3. List any financial assurance requirements for oil and gas exploration and production wastes:

4. Organization and Coordination:

   Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

   Please list the types of enforcement actions available?

ARIZONA

INTRODUCTION

Arizona produced 104,100 barrels of oil and 174 MMCF of gas in 1988. Production was from 26 oil wells an 5 gas wells. Approximately 526 barrels of produced waters are produced in the State per day.

REGULATORY AGENCIES

The five agencies that regulate the oil and gas industry in Arizona are:

* Arizona Oil and Gas Conservation Commission;
* U.S. Bureau of Land Management;
* U.S. Bureau of Indian Affairs;
* Arizona Department of Environmental Quality; and
* EPA, Region IX.

The Bureau of Land Management (BLM) has the authority to issue oil and gas drilling permits for Federal minerals. Where Indian mineral rights prevail, oil and gas activity may be governed by both the BLM and the Bureau of Indian Affairs.

The Arizona Oil and Gas Conservation Commission reviews all oil and gas drilling applications and is primarily responsible for approving and enforcing oil and gas activities. The Oil and Gas Commission's regulations pertain to the construction, location, and operation of onsite drilling and production activities.

Arizona does not have NPDES or UIC program primacy. The Department of Environmental Quality coordinates with EPA's Region IX for any surface water discharge or underground injection permits. Region IX administers the UIC program; there are no discharges from oil and gas facilities.

STATE RULES AND REGULATIONS

Drilling

Reserve pits receive drilling fluids and muds, drill cuttings, and any waters produced during drilling. The pits are allowed to evaporate before closure, and then are filled.

Production

All waters produced during the production phase are reinjected, for either enhanced recovery or disposal. To drill an injection well, permit approval is required from both EPA Region IX and the Commission. The casing and cementing requirements in the Arizona State regulations are general, requiring "safe or adequate casing or tubing in order to prevent leakage," cemented and set to prevent damage to gas, oil, or freshwater strata. Surface casing is required to be pressure tested at 600 psi for 30 minutes, with a maximum allowable drop of 10 percent in pressure.

Plugging/Abandonment

When a well is plugged, a 50-foot cement plug must be placed immediately above each producing formation, and a continuous cement plug must be placed through, and to 50 feet above and below all freshwater strata. A 20-foot cement plug must be placed at or near the surface of the well. Intervals between plugs must be filled with heavy mud. An uncased hole must be plugged with heavy mud up to the base of the surface string, at which point a 50-foot plug must be placed in and out of the bottom of the surface pipe.

References

Brady, Ray. Deputy State Director, Division of Mineral Resources. Letter to U.S. Environmental Protection Agency, September 4, 1985.

Oil and Gas Conservation Commission. 1982. Arizona Administrative Code Chapter 7, Article 1. Oil, Gas, and Helium.

Personal Communications:

Lyndon Hammon, NPDES Permits Section Manager, Arizona Department of Health and Safety. September 29, 1986 (602) 257-2262.

Nate Lau, Director of the UIC Division, EPA Region IX. September 28, 1986 (415) 974-0893.

STATE: Arkansas

AGENCIES: Arkansas Oil and Gas Commission (AOGC) - subsurface
Arkansas Department of Pollution Control and Ecology (ADPCE) - surface

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (ADPCE) -
Roadspreading - (ADPCE) -
Pits - (ADPCE) - No rules on reserve pits.
Surface water discharge - (ADPCE-AOGC) -
Waste haulers - (ADPCE-AOGC) -
Burial or landfill - (ADPCE) -
EOR/injection wells - (AOGC) - Produced water injected.

BONDING: Compliance bond required. Can include a financial statement or letter of credit. Bond amount is $15,000 per well.

ENFORCEMENT: Oil and Gas Commission initiates enforcement actions. The AOGC may initiate enforcement action against any or all violations covered in the AOGC General Rules and Regulations (Order No. 2-39). The ADPCE may also initiate enforcement action for any violation of the provisions of Regulation Number 1 of 1958, or for any violation of the State Clean Water Act (Act 472 of 1949), related to the exploration and production of oil and gas in the State of Arkansas.

COMMENTS: Only "informal" permits issued by Department of Pollution Control and Ecology. Disposal of drilling wastes must be permitted. Drilling waste disposal companies must keep records. Currently considering revisions that would be modeled on Louisiana Rule 29B.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Arkansas

Forms completed by: Martin T. Perdue and
Gerald L. Delavan

Agency: Arkansas Oil & Gas Commission (AOGC)
Phone: 501) 862-4965

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: AOGC
Arkansas Dept. of Pollution Control & Ecology (ADPCE)

Off-site disposal: AOGC
Arkansas Dept. of Pollution Control & Ecology (ADPCE)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Subsurface - AOGC (MOA)

Surface - ADPCE (MOA)

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   AOGC - One; None
   ADPCE - One full time Class II, saltwater disposal system inspector - Field Office. Three part-time (as needed) water division inspectors for Class II wells.

2. Legal support; and

   AOGC - None
   ADPCE - Staff attorneys available as needed.

3. Permitting, siting, and administration.

   AOGC - One; None
   ADPCE - One full time staff engineer for permitting SWD systems - Field Office. One full time administrative assistant - Field Office. One part-time geologist, one administrator - L. R. Office.

Please indicate, for each agency above, what type of training is needed for your staff.

Any type of UIC training concerning Class II wells. - Yes

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	ADPCE	ADPCE
b.	Roadspreading	ADPCE	ADPCE
c.	Pits	ADPCE	ADPCE
d.	Surface water disposal	ADPCE/AOGC	ADPCE
e.	Waste haulers	ADPCE/AOGC	ADPCE/AOGC
f.	Burial or landfill	ADPCE	ADPCE
g.	Disposal wells	AOGC	AOGC
h.	Enhanced oil recovery injection wells	AOGC	AOGC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	AOGC	AOGC
b.	Clean Water Act (NPDES)	ADPCE	ADPCE
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	ADPCE	ADPCE
	Subpart D (Non-Hazardous)	ADPCE	ADPCE

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Bond or Letter of Credit in the amount of $15,000.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

AOGC initiates enforcement actions - MOU
ADPCE may also initiate formal enforcement actions regarding water qualtiy violations in relation to all surface facilities related to oil and gas E&P in Arkansas (drillsites, reserve pits, saltwater disposal systems, stock tanks, flow lines). Any discharge from an oil or gas E or P system which results in or may result in contamination to "waters of the state" may cause the initiation of formal enforcement action by the department.

Please list the types of enforcement actions available?

ARKANSAS

INTRODUCTION

Arkansas produced 19,715,691 barrels of oil and 194,483 MM cubic feet of gas in 1985. Production is from 9,490 oil wells and 2,492 gas wells. The State is divided into three oil and gas exploration and production districts. The Arkoma Basin, located in the west and westcentral (Arkansas River Valley Province portion of the state), produces 99 percent natural gas on a volume basis. The Mississippi Embayment in south and southwestern Arkansas produces approximately 90 percent oil and 10 percent gas. Northwestern Arkansas also produces small amounts of shallow natural gas.

REGULATORY AGENCIES

The two agencies that regulate oil and gas activity in Arkansas are:

* Arkansas Oil and Gas Commission; and
* Arkansas Department of Pollution Control and Ecology.

The Arkansas Oil and Gas Commission regulates industry practices regarding drilling and production activities of oil and gas wells under the authority of Act 105 of 1939 (the "Oil and Gas Act"), Act 937 of 1979, and Act 523 of 1981. Act 105 created the Oil and Gas Commission and authorized it to prevent the waste of oil and gas resources and the pollution of freshwater supplies by oil, gas, or salt water. Act 937 authorized the Commission to prevent waste in produced water production. Act 523 amended the "Oil and Gas Act" to authorize the Oil and Gas Commission to "acquire primary enforcement responsibility either singularly or jointly with the Department of Pollution Control and Ecology for the control of underground injection under the applicable provisions of the Safe Drinking Water Act." Drilling and production practices are regulated under the "General Rules and Regulations" of the Commission (Order No. 2-39). The General Rules and Regulations do not address all aspects of industry practices, and refer the reader to "special rules pertaining to individual oil, gas, or salt water fields and pools." Special rules of any nonemergency nature require a public hearing, and are provided for in Rules A-2 and B-38 of the General Rules and Regulations.

The Arkansas Department of Pollution Control and Ecology (ADPCE) regulates pollution generally, or pollution specifically related to oil and gas drilling and production wastes, under authority of Act 472 of 1949 (the "Arkansas Water and Air Pollution Control Act"), Act 120 of 1961, Act 254 of 1969, and 743 of 1975. Act 472 provided authority to ADPCE to establish pollution standards and industrial discharge limits for State waters. Act 120 included "wells" within the definition of waters of the State, and made it a violation to cause pollution in waters of the State. Act 254 provided a tax penalty for operators allowing salt water to escape a lease, and required ADPCE to identify the source of pollution and to take steps to eliminate it if the chloride level in any stream exceeded 250 ppm. Act 743 of 1975 provided ADPCE with jurisdiction to permit disposal of pollutants into wells.

The principal regulations of ADPCE related to oil and gas drilling and production wastes are found in Regulation No. 1, "Regulation for the Prevention of Pollution by Salt Water and Other Oil Field Wastes Produced by Wells in New Fields or Pools." The regulation was promulgated on October 13, 1958, pursuant to the authority provided by Act 472.

ADPCE is currently considering revisions to Regulation No. 1 that would be modeled on Louisiana State Order No. 29-B. As of the start of 1987, however, the timing and outcome of the effort were uncertain.

Arkansas has primacy for both the NPDES program and the UIC program. The NPDES program is administered by ADPCE. A Memorandum of Agreement (March 25, 1982) governs the division of authority between ADPCE and the Oil and Gas Commission with respect to underground injection wells, but there continues to be some disagreement between the two agencies as to what the Agreement actually allows or requires.

Under the Agreement, ADPCE has primary responsibility for Class I, II (surface facilities), IV, and V injection wells, except for bromine-related brine disposal wells. AOGC is given "administrative management responsibility for the issuance of construction and operating permits for Class II and Class V bromine-related disposal wells. AOGC shall be responsible for enforcement in respect to all Class II wells." AOGC is further described as responsible for well integrity and the migration of wastes from the injection strata into actual or potential drinking water aquifers.

The Memorandum also notes, however, the statutory overlap of jurisdiction that it was intended to resolve. The degree to which this issue is still unresolved is reflected in the introduction, during the current session of the legislature, of a bill drafted by counsel for the Commission that would have given the Commission exclusive authority with respect to Class II wells, while repealing all portions of statutes giving ADPCE any claim to such jurisdiction. The bill failed to get out of committee.

The result of this conflict is that operators do not always comply, or believe they need to comply, with all of the requirements of ADPCE. According to informaion provided by both the Department and the Commission, operators in the gas fields in the northern part of the State tend to follow the Department's requirements, while those in the older oil fields in the south frequently fail to apply for ADPCE permits or follow their requirements.

STATE RULES AND REGULATIONS

Drilling

The Oil and Gas Commission does not have any specific regulations governing the construction or management of reserve pits of the disposal of drilling wastes, nor does Regulation No. 1 of ADPCE impose any requirements on reserve pits. Typical practices include onsite disposal in unlined reserve pits or landspreading in the vicinity of the pit.

ADPCE, however, has been sending out letters of authorization intended to serve as informal permits that stipulate management practices for reserve pits and disposal of drilling wastes. Many of the provisions required by the letter are those the Department would like to include in a proposed revision of Regulation No. 1. The lack of specific regulations containing the provisions in the letter, however, has resulted in uneven compliance with these requirements by operators. The letter lists conditions that the Department of Pollution Control and Ecology expects to be followed during drilling operations pertaining to reserve pit construction, pit fluid and drilling mud disposal, and drill site reclamation.

Under the letter's requirements, all earthen pits must be lined with a synthetic liner (20 mils thick) or a clay liner (18 to 24 inches thick), and must maintain at least 2 feet of freeboard. Pits must be reclaimed to grade and seeded within 60 days after the drilling rig has been removed from the site. Reserve pit fluids can be disposed of only by ADPCE permitted disposal services.

The letter of authorization also states that completion fluids high in total dissolved solids, such as KCl, should be kept separate from the contents of the reserve pit, and recommends that a lined pit be used for this purpose.

Production

Rules C-7 and C-8 of the General Rules and Regulations define the means by which salt water produced from oil and gas wells can be discharged into subsurface formations for disposal or enhanced recovery. The Oil and Gas Commission states that it will consult the State Geological Survey and the State Board of Health, when reviewing an application to inject salt water, in order to protect freshwater supplies.

Wells for disposal and enhanced recovery are to be cased and cemented "in such manner that damage will not be caused to oil, gas, or freshwater resources." Injection pressure must be limited to ensure that fractures are not propagated in the confining zones. Injections must be through tubing set on a packer. Information must be provided by the applicant on all wells or dry holes within one-half mile of the new or converted injection well.

Section 4 of Regulation No. 1 forbids discharging salt water from any oil or gas well in a manner whereby the salt water might come in contact with "any of the waters of the State, whether by natural drainage, seepage, overflow, or otherwise." Other sections of Regulation No. 1 require the well operator to obtain a permit for a waste disposal system that prevents the wastes from contacting State waters. The regulation provides two alternatives for saltwater disposal: (1) subsurface discharge in disposal wells constructed in accordance with the Rules and Regulations of the Arkansas Oil and Gas Commission, and (2) surface discharge into lined earthen pits. Currently, only subsurface disposal is permitted.

The letter of authorization issued by the Arkansas Department of Pollution Control and Ecology states that salt water produced any time during the lifetime of a well will remain the responsibility of the production company, and "shall be stored in a plastic or fiberglass tank above ground and resting on a concrete pad."

Offsite Disposal

Disposal of reserve pit fluids and drilling mud requires a permit from the Arkansas Department of Pollution Control and Ecology. The permit stipulates that the disposal company must provide an analysis of the pit fluids and drilling mud, soils analysis for each site, number of acres available for land application, the amount hauled, and its final destination for each disposal site. A disposal company that is permitted to land apply pit fluid and drilling mud near the well must provide the Department with a copy of the landowner's agreement as well as an analysis of the wastes. An analysis of pit fluid will include tests for chlorides and pH, and a drilling mud analysis will contain tests for chromium, zinc, chlorides, and pH. Soils analysis should include pH, CEC, ESP and conductivity.

Plugging/Abandonment

Wells that are not completed as commercially productive after drilling must be abandoned and plugged before the drilling equipment is released from the drilling operation. No time limitation is established in the regulations, however, for temporary abandonment of a properly cased well.

When plugging, a 100-foot cement plug must be placed above each producing stratum, or a bridge plug may be used. A cement plug of 100 feet must be placed 50 feet below the base of the freshwater stratum if surface casing is not cemented below that stratum; if it is cemented, a 100-foot cement plug should be placed inside the base of the surface casing. A plug should be set at the surface of the ground in such a way as not to interfere with cultivation. Intervals between plugs should be filled with heavy mud-laden fluid.

References

Arkansas Department of Pollution Control and Ecology. Regulation No. 1, October 1958.

Arkansas Oil and Gas Commission. State of Arkansas Rules and Regulations Order No. 2-39, revised 1983.

Interstate Oil and Gas Commission. 1986. Summary of State Statutes and Regulations for Oil and Gas Production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Letter to Mr. Naresh R. Shah, West Virginia Department of Natural Resources Permits Branch, from Mr. Terry Muse, Arkansas Department of Pollution Control and Ecology, regarding Arkansas Water Permit No. 2839-W, March 2, 1984.

Letter of Authorization from Mr. David A. Thomas, Arkansas Department of Pollution Control and Ecology, to Mr. William S. Walker, Stevens Production Company, August 20, 1986.

USEPA. 1985. U.S. Environmental Protection Agency. Proceedings: Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

Steve Weaver, Arkansas Department of Pollution Control and Ecology (501) 562-7444.

Steve Drown, Arkansas Department of Polltuion Control and Ecology (501) 562-7444.

Martin T. Perdue, Arkansas Oil and Gas Commission (501) 862-4965.

Gerald L. Delavan, Arkansas Department of Pollution Control and Ecology. August 1986, (501) 562-7444.

John Welch, Arkansas Game and Fish Commission (501) 223-6319.

William Wynne; Crumyler, O'Connor, and Wynne; serving as counsel to Arkansas Oil and Gas Commission (501) 863-8118.

STATE: California

AGENCIES: Department of Conservation
Division of Oil and Gas (DOG)
State Water Resources Control Board (SWRCB)
Department of Health Services (DHS)
Department of Motor Vehicles (DMV)

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (SWRCB-DHS) -

Roadspreading - SWRCB-DHS) -

Pits - (SWRCB-DHS) - Drilling pit liners needed in certain locations. Solids must be tested prior to closure. Evaporation and percolation pits permitted for production fluids.

Surface water discharge - (SWRCB-DHS) - Produced water may be discharged for beneficial use if certain standards are met.

Waste haulers - (DMV) - An invoice is required for hauling produced fluids. If being trucked to a centralized injection facility, a ticket designating the volume and source must accompany the fluids.

Burial or landfill - (SWRCB-DHS) -

EOR/injection wells - (DOG) - Delegated Class II program. Over half of the produced waters are reinjected for enhanced recovery or disposal.

BONDING: Compliance bond required. Bond is required when operator is about to drill, redrill, deepen or permanently alter a well. Bond amount for onshore wells depends on depth of well, and ranges from $10,000 to $25,000 per well or $100,000 for a blanket bond. Bond amount for offshore wells is $250,000. Bond amount for Class II disposal wells is $50,000.

ENFORCEMENT: The State Oil and Gas Supervisor can impose civil penalties. The local District Attorney can issue criminal citations and penalties. Administrative orders are also available.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: California

Forms completed by: Mike Stettner

Agency: California Division of Oil & Gas

Phone: (916) 323-1777

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Division of Oil & Gas*
(Division)
(subsurface disposal)
State Water Resources
Control Board (SWRCB)
(surface disposal)

Off-site disposal: Division of Oil & Gas*
(Division)
(subsurface disposal)
State Water Resources
Control Board (SWRCB)
(surface disposal)

*Class II fluids

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The Division of Oil & Gas is the lead agency for regulating underground injection of Class II waste water. The Division has a Memorandum of Agreement (see attachment) with the SWRCB, whereby the permitting of surface waste-water disposal is handled by SWRCB. However, the SWRCB's appropriate Regional Water Quality Control Board (RWQCB) may review permits written by the Division to ensure their concerns are incorporated.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No. Both are independent agencies.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   The Division has a staff representing 5.5 personnel years (PY) devoted solely to our UIC program, supported by federal funds of about $271,000 annually. In addition, about $1,800,000 in State funds, including an estimated 29 PY, is provided to support our statewide UIC program.

   It is estimated that the SWRCB, through its nine Regional Water Quality Control Boards (RWQCB), expends about two PY at a funding of approximately $80,000.

2. Legal support; and

   Provided by the Attorney General's Office. Approximate Division expenditure is $3,500 annually. There are no federal UIC funds budgeted for this support. State funds are used for this purpose.

3. Permitting, siting, and administration.

   Division funding and PY for these activities are included in Section C.1. above. In addition, the Division expends about one PY (approximately $42,000 in funds) to review surface disposal permits and other SWRCB actions.

   It is estimated that the SWRCB expends two PY in this area at a budget cost of about $100,000.

Please indicate, for each agency above, what type of training is needed for your staff.

Oil & Gas Technician - equivalent of one year hands-on experience.

Energy & Mineral Resources Engineer (entry level for Oil & Gas Engineer) - education equivalent to graduation from college with major work in geology, mining or petroleum engineering, or a closely-related field. Typically, most oil and gas engineers hold a B.A. or B.S. degree in Geology or Petroleum Engineering. Additional training is provided, whether in the form of courses, workshops, seminars, etc., for all areas related to underground injection.

RWQCB requires B.S. or B.A. degree, or equivalent college courses. Additional required safety training, regarding the handling of hazardous waste.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	SWRCB/DHS	SWRCB/DHS
b.	Roadspreading	SWRCB/DHS	SWRCB/DHS/Fish & Game
c.	Pits	SWRCB/DHS	SWRCB/DHS
d.	Surface water disposal	SWRCB/DHS	SWRCB/DHS
e.	Waste haulers		Dept. Motor Vehicles
f.	Burial or landfill	SWRCB/DHS	SWRCB/DHS
g.	Disposal wells	Division of Oil & Gas	Division of Oil & Gas
h.	Enhanced oil recovery injection wells	Division of Oil & Gas	Division of Oil & Gas

(DHS - Department of Health Sciences)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	Division of Oil & Gas	Division of Oil & Gas
b.	Clean Water Act (NPDES)	SWQCB	SWQCB
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DHS/RWQCB	DHS/RWQCB
	Subpart D (Non-Hazardous)	RWQCB	Waste Management Board * RWQCB (*if waste is disposed of in a Class II landfill)

3. List any financial assurance requirements for oil and gas exploration and production wastes:

An individual plugging bond must be filed for each new or converted oil and gas well or injection well (ranging from $10,000 to $25,000 depending on depth of the well), or a blanket bond of $100,000 for all wells. Individual and blanket bonds are released when the well or wells covered under the bond have been properly completed, and have been producing or injecting for a continuous 6-month period or abandoned, or another valid bond has been sustained.

A $50,000 bond must be filed for each Class II commercial waste-water disposal well to cover all operations of drilling, redrilling, deepening, altering casing, maintaining, or abandoning the well and attendant facilities.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The State Oil and Gas Supervisor, Division of Oil and Gas, has the authority to impose civil penalties. Criminal penalties may be imposed as well; however, the local district attorney's office is requested to issue the citation.

Please list the types of enforcement actions available?

1) Administrative Order
2) Civil Penalty
3) Criminal Penalty

CALIFORNIA

INTRODUCTION

California produced 355,500,000 barrels of oil and 403 billion cubic feet of gas in 1988. California ranked fourth in the U.S. oil production and sixth in U.S. gas production. Production was from 50,907 producing oil wells and 1,469 producing gas wells. Approximately 55 percent of the oil production is attributed to enhanced recovery.

REGULATORY AGENCIES

A number of agencies regulate oil and gas activity in California, including:

* California Department of Conservation, Division of Oil and Gas;
* California Water Resources Control Board and the nine Regional Water Quality Control Boards;
* California Department of Health Services;
* California Air Resources Board and the county or regional Air Pollution Control Districts;
* State Lands Commission;
* California Coastal Commission;
* Local government agencies;
* U.S. Bureau of Land Management; and
* U.S. Department of Energy.

The Division of Oil and Gas of the California Department of Conservation, created in 1915, issues permits for the drilling, reworking, and abandonment of oil and gas wells. Under authority delegated by EPA, the Division also issues UIC permits for Class II injection wells. As part of its responsibilities, the Division ensures that the drilling and operation of such wells do not endanger fresh ground-water strata.

The California Water Resources Control Board is generally responsible for protecting the waters of the State and for preserving all present and anticipated beneficial uses of these waters. EPA has delegated authority to issue NPDES permits to the Water Resources Control Board. This responsibility is implemented through nine Regional Water Quality Control Boards, which issue Waste Discharge Requirements (California's NPDES permits) for point sources of water pollution. The Water Resources Control Board has the authority to adopt statewide water quality policy and water quality control plans for regional boards to follow.

The regional boards must, at a minimum, implement requirements as strict as those of the State board; however, they have autonomy to develop more stringent requirements within their regions. All discharges of drilling wastes or produced waters to surface impoundments or surface waters are subject to the permitting authority of the regional boards. Under a Memorandum of Understanding between the Regional Water Quality Control Boards and the Division of Oil and Gas, the regional boards also have the responsibility for reviewing permits written by the Division of Oil and Gas to ensure the incorporation of the concerns of the regional boards.

The California Department of Health Services is responsible for the regulation of hazardous wastes. The Department determines which waste streams and constituents are hazardous under California's laws, including determinations as to the hazardousness of drilling fluids and muds. The Department is also responsible for the regulation of the injection wells into which hazardous wastes are being injected. Further, the Department of Health Services shares with the Regional Water Quality Control Boards the responsibility for regulating hazardous waste landfills and surface impoundments.

For wells on State-owned, onshore lands, the State Lands Commission has joint responsibility with the Division of Oil and Gas. Their responsibilities are expressed in the provisions of the lease terms.

The California Department of Fish and Game, while not a permitting agency for drilling projects, provides comments and recommendations on methods to mitigate any problems that oil and gas operations may create for fish and wildlife. The Department of Fish and Game coordinates State operations involving spills that affect fish and wildlife.

Local Air Pollution Control Districts issue permits to operate equipment that emits pollutants into the atmosphere. The equipment includes steam generators used for enhanced oil recovery projects.

The California Coastal Commission issues permits for any development proposed within the coastal zone. This zone extends from the State's 3-mile seaward limit to 1,000 yards inland. Oil and gas projects within this area would need permits, although there are provisions for exemptions.

Cities and counties also issue land use permits for oil and gas operations. Generally, a condition of their permits requires that an operator comply with the regulations of the Division of Oil and Gas.

The Bureau of Land Management (BLM) approves approximately 400 oil and gas drilling permits per year on Federal lands and provides permits for wells for reinjection of produced waters. Since operators of these wells must meet the requirements of the State as well as BLM, they are subject to dual permitting. In 1985, there were 6,200 oil, gas, and injection wells on Federal lands. The oil and gas wells produced about 22.4 million barrels of water per month, with most going to reinjection and some to evaporation percolation ponds.

The Department of Energy manages the Elk Hills Naval Petroleum Reserves. In 1985, these fields produced approximately 86,000 barrels of water, 128,000 barrels of oil, and 184 billion cubic feet of gas per day. Produced waters have been reinjected or disposed of in earthen sumps, but the Department of Energy has been managing a transition to disposal only in injection wells.

STATE RULES AND REGULATIONS

Drilling

Under Article 9 of Title 22 of the California Administrative Code, drilling fluids and drilling muds are listed as wastes that come under the provisions of the regulations for hazardous wastes if they contain a hazardous material. Most muds actually in use in California do not fall under this provision, however. The Department of Health Services has prepared a list (available to operators on request) of additives and fluids that are nonhazardous if used according to the manufacturers' recommendations. The Department will also review test data submitted by companies on new muds or fluids when requested to do so, in order to determine if they are nonhazardous.

Discharges of drilling muds and cuttings that do not contain halogenated solvents into onsite sumps are specifically excluded from the requirements affecting "Discharges of Waste to Land" (Subchapter 15, Chapter 3, Title 23) under the jurisdiction of the Regional Water Quality Control Boards, provided that the operator takes appropriate measures at the conclusion of drilling operations. The operator must either "(1) remove all wastes from the sump or (2) remove all free liquid from the sump and cover solid and semisolid wastes, provided that representative sampling of the sump contents after liquid removal shows residual solid wastes to be nonhazardous."

Drilling pits may or may not need to be lined or sealed depending on their location. While the Regional Water Quality Control Boards do not prescribe pit construction conditions, the conditional use permit that a driller obtains from each county may detail the pit requirements. If the fluids contain hazardous materials, the pits would have to have liners.

On Federal lands, drilling fluids are left in the sump until completion of the well, after which drilling fluids are hauled to a Class II disposal site for oil field wastes.

Before drilling a well, operators must file an indemnity bond with the Division of Oil and Gas to ensure that the applicant complies with the permit requirements and properly abandons or completes the well. After proper abandonment or completion, the Division releases the bond.

Produced Waters

Produced waters may be reinjected for enhanced recovery or disposal, discharged on the surface for beneficial use, placed in lined sumps for evaporation or unlined sumps for evaporation and percolation, or disposed of in sewer systems. In some cases, produced waters ultimately disposed of in sumps are firtst discharged into watercourses, which carry the salt water to the sumps. The impact and legality of this practice are currently under review. The approximate percentages of produced water disposed of by each method are:

Evaporation in percolation sumps	18%
Evaporation in lined sumps	6%
Disposal in sewer systems	2%
Surface disposal (beneficial)	18%
Injection for enhanced recovery	41%
Injection for disposal	15%

Surface Discharge for Beneficial Use

In cases where the quality of the water is sufficient for beneficial use for irrigation, livestock, and/or wildlife, produced waters may be permitted for discharge into surface waters (principally into irrigation canals, dry ditches, and ephemeral streams). There are at least 12 such permits in the Fresno office of the Central Valley Regional Water Quality Control Board. Discharge permit limits include the following maximum values:

Oil and grease	35 mg/L
Chlorides	200 mg/L
Boron	1 mg/L
Electrical conductivity	1,000 umhos.

Sewer Disposal

The small percentage that goes to sewer systems is predominantly within the Los Angeles County Sanitation District. Production waters entering such sewers must meet applicable pretreatment standards, including a maximum oil and grease content of 75 mg/L, and limits on heavy metals, cyanide, chlorinated hydrocarbons, and sulfides. There is no pretreatment limit for chloride.

Pits

Regulation of all saltwater sumps is under the jurisdiction of the Regional Water Quality Control Boards, which have the authority to regulate discharges to surface impoundments "by issuing waste discharge requirements, including discharge prohibitions, which implement water quality control plans" (Title 23, Chapter 3, Subchapter 15 of the California Administrative Code). But while minimum regulatory standards are established for various classes of impoundments under Subchapter 15, a specific exemption is provided for evaporation ponds and percolation ponds if "the applicable regional board has issued waste discharge requirements, reclamation requirements, or waived such issuance." To be eligible for the exemption, the discharge must also be nonhazardous and comply with the State Board's nondegradation policy and with "the water quality objectives set forth in the applicable water quality control plan..." For example, unlined sumps containing produced waters that could adversely affect freshwater aquifers would not be permitted in locations which could impact such aquifers.

Regional Water Quality Control Boards, while they must at least implement the requirements established by the State board, have the authority to establish requirements more stringent than those set by the State board. Thus, the regional boards may establish specific pit construction requirements (e.g., liners to prevent percolation from the sumps) in sensitive areas.

Any sump, other than an operations sump, containing a mixture of oil and water, must be covered with screening to restrain entry of wildlife. If the Department of Fish and Game deems the condition of a sump to be hazardous for wildlife, the Department notifies the Division of Oil and Gas, which requires the operator to abate the condition within 10 days (if an immediate or grave danger) or 30 days.

In addition to discharge to onsite saltwater sumps, substantial volumes of salt water are discharged to offsite sumps. There are discussed below.

Injection

Over half of the produced waters in California are reinjected, either for enhanced recovery or for disposal. The authority for management of Class II injection wells is delegated by EPA to the Division of Oil and Gas. The Regional Water Quality Control Boards, under a Memorandum of Understanding with the Division of Oil and Gas, may comment on Class II injection well permits on matters that could affect water quality, including degradation of ground water.

On Bureau of Land Management leases, operators of Class II wells must obtain permits from both the Division of Oil and Gas and BLM. Many of the injection wells are for enhanced recovery and therefore could significantly affect BLM's royalty earnings from its leases. As a result, BLM wants to maintain joint signatory authority on UIC permits. BLM and the Division of Oil and Gas are attempting to develop a Memorandum of Understanding of joint permitting.

Injection wells, other than those injection steam, air, or pipeline quality gas, must be equipped with tubing and packer set immediately above the approved zone of injection. Exceptions may be granted where there is no evidence of freshwater-bearing strata, where more than one string of casing is cemented below the base of fresh water, or where the operator can demonstrate that freshwater and oil zones can be protected without tubing and packer. The pressure in the well must not be sufficient to fracture the zone of injection.

Offsite Disposal

Central Sumps for Produced Waters

On the western side of the San Joaquin Valley, a series of large percolation/evaporation sumps receive produced water discharged to them through natural watercourse drainage. The Department of Energy has ordered the closure of two of these sumps, which are on the property of the Elk Hills Naval Petroleum Reserve; the two sumps no longer receive produced waters and are in the process of closure. The remaining sumps are still operating. Some of the wells discharging to the sumps, and some of the watercourses through which the discharges go, are on Federal lands managed by the Bureau of Land Management. Currently, most of the sumps either operate under requirements dating back two decades, or have no requirements at all.

While this disposal method currently is allowed, the Central Valley Regional Water Quality Control Board is considering whether these produced waters should be regulated under the requirements of California "designated" wastes (if they contain pollutants that exceed water quality objectives or could cause degradation of the waters of the State). There is also a question as to whether this method of disposal is in accordance with 435.32 of 40 CFR, since the discharge to the sumps is through natural watercourses, and the discharged waters generally do not meet the requirements for agriculture and wildlife use.

Waste Disposal Facilities for Drilling Wastes

Drilling wastes may be transported offsite for disposal. If hazardous by California's definition, the wastes must be diposed of (as required by Section 2521, Subchapter 15, Chapter 3, Title 23) in Class I waste management units (requiring double liners and no migration). If classified as "designated" wastes, they may be disposed of in Class II facilities (single liners, no migration, and design and construction "for the containment of the specific waste which will be discharged") or Class I facilities. If nondesignated, alternative uses would be permissible.

As of January 1, 1989, water-base drilling mud filtrate was designated as Class II type fluids. As a result of this determination, the Division will assume regulatory responsibility for wells that inject water-base drilling mud filtrate.

Transport

An invoice for an undesignated waste is required for trucks hauling produced water. If being trucked to a central injection facility, the Division of Oil and Gas requires that the trucker carry a ticket designating the volume and source of the fluid. The operator of the central facility collects a copy of the tickets and files it.

Plugging/Abandonment

Under Section 3237 of the Public Resources Code, suspension of activity and removal of drilling activity is evidence of desertion of a well after 6 months. Removal of production equipment is evidence of desertion after 2 years. While the Supervisor of the Division of Oil and Gas may order the plugging of a well that has been deserted, the Division of Oil and Gas generally exercises its discretion for previously producing wells (particularly those that were permitted prior to the existence of a bonding requirement). Moreover, the Division actively communicates with operators about plugging wells that have been out of production for 5 years.

When a well is plugged, cement plugs generally should be placed across specified intervals to protect oil, gas, and usable water zones. The district deputy may allow cement to be mixed with or replaced by other substances with adequate physical properties. Intervals that are not plugged are to be filled with mud fluid of "sufficient weight and consistency" as to prevent movement of other fluids into the wellbore.

At the surface, the hole and all annuli must be plugged with at least a 25-foot cement plug. In an open hole, a cement plug must be placed from at least 100 feet below the bottom to at least 100 feet above the top of each oil or gas zone, and at least a 200-foot plug must be placed across all fresh-saltwater interfaces. Where the hole is open below the shoe, a cement plug is required from 50 feet below to 50 feet above the shoe.

In a cased hole, all perforations must be plugged with cement, and a plug must extend at least 100 feet above the top of a landed liner, the uppermost perforations, the casing cementing point, the water shutoff holes, or the oil and gas zone, whichever is highest. If cement is behind the casing across the fresh-saltwater interface, a 100-foot cement plug must be place at the interface inside the casing. If the top of the cement behind the casing is below the top of the highest saltwater sands, squeeze-cementing is required through perforations to protect the fresh water, in addition to a 100-foot plug inside the casing.

References

California Administrative Code: Titles 14, 22, and 23. Title 14, Chapter 4 - Development, Regulation and Conservation of Oil and Gas Resources Title 23, Chapter 3, Subchapter 15 - Discharges of Waste to Lead Title 22, Chapter 30 -Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes.

Interstate Oil and Gas Commission. 1986. Summary of State Statutes and Regulations for Oil and Gas Production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

Mefferd, Marty. 1985. Letter communication to EPA. Supervisor, Division of Oil and Gas.

USEPA. 1985. U.S. Environmental Protection Agency. California Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communicatons:

Theodore R. Anderson, Bureau of Land Management, Bakersfield, (805) 861-4177.

Hal Bopp, Division of Oil and Gas (805) 322-4031.

Shelton Gray, Central Valley Water Quality Control Board (209) 445-5142.

Bob Reid, Division of Oil and Gas (916) 445-9686.

Chong Rhee, L.A. County Sanitation District (213) 699-7411.

Scott Smith, Central Valley Water Quality Control Board (209) 445-5116.

Greg Williams, Department of Health Services (916) 322-0453.

STATE: Colorado

AGENCIES: Department of Natural Resources
* Oil and Gas Conservation Commission (OGCC)
Department of Health
Waste Management Division (WMD)
Water Quality Control Commission (WQCC)
U.S. Bureau of Land Management

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (OGCC) - Reserve pit solids are generally tilled into the ground.

Roadspreading - (WMD) -

Pits - (OGCC-WMD) - Reserve pits authorized by rule with closure within 6 months. Storage and disposal pits for produced water authorized by permit. Off-site commercial evaporation pits are used. Liners may be required.

Surface water discharge - (WQCC) - Surface water discharges authorized under the BPT Wildlife and Agricultural Use Subcategory.

Waste haulers - (OGCC-WMD) - Truckers of produced water must file monthly reports on source, volume and recipient of wastes.

Burial or landfill - (OGCC-WMD) -

EOR/injection wells - (OGCC) - Delegated Class II program. Produced water injected for enhanced water and disposal.

BONDING: Compliance bond required. Bond conditioned upon compliance with laws and rules and regulations with reference to properly plugging wells. Separate surface restoration bond required when landowner is not party to lease agreement. Amount of bond is $5,000 for plugging, $2,000 for surface damage on land not irrigated, and $5,000 for surface damage on irrigated land. Blanket bond amounts are $30,000 for plugging and $20,000 for surface damage.

ENFORCEMENT: Administrative enforcement actions include:

- contact, explanation & resolution
- contact, administrative hearing & resolution
- formal hearing before the appropriate board or commission - can include assessing fines
- action in District Court

The assessment of fines and formal actions are taken through the Attorney General.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Colorado

Forms completed by: William R. Smith

Agency: Colorado Oil & Gas Conservation Commission (OGCC)
Phone: (303) 894-2100

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Oil & Gas Conservation Commission of the Dept. of Natural Resources

Off-site disposal: (by operators) Oil & Gas Conservation Commission of the Dept. of Natural Resources

Off-site disposal: (Commercial by non-operators) Waste Management Division (WMD) of Dept. of Health

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The Oil and Gas Conservation Commission is responsible for regulating drilling, casing, operations and plugging of seismic holes, exploratory wells, and the abandonment of producing wells in such a manner as to prevent the escape of oil or gas from one stratum into another, the intrusion of water into oil or gas stratum, the pollution of fresh water supplies by oil, gas, salt water, or brackish water and, under primacy granted by EPA, the regulation and administration of Class II injection wells on all lands other than those owned by the Indians.

Waste Management Division of DOH has responsibility for the disposal of solids (includes liquids) on the surface. By agreement, OGCC has jurisdiction over earthen pits, either on-site or central which are operated by the producers of oil, gas and the material being disposed. WMD has jurisdiction over commercial facilities for disposal of produced fluids which are not operated by the operators who produced the fluid. They also have jurisdiction over landfills.

Water Quality Control Division (WQCC) of DOH has responsibility for setting classifications and standards for both surface and ground water. They also issued NPDES permits for point source discharges to the streams of the State. All significant streams have been classified as to use municipal, fishery, agriculture, and etc. and standards have been set based on these uses.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

There is no organization relationship between these organizations. Each operate under their own statute, rules and regulations, and policies.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   OGCC - $313,850
   WQCC - an insignificant part of their budget since less than 20 permits issued for oil and gas operations.
   WMD - an insignificant part of their budget since there are only 13 commercial facilities.

2. Legal support; and

   OGCC - $8,000
   WQCC - -0-
   WMD - -0-

3. Permitting, siting, and administration.

   OGCC - $70,000
   WQCC - -0-
   WMD - -0-

Please indicate, for each agency above, what type of training is needed for your staff.

OGCC - Must be engineers or graduates in a closely related field with varying amounts of field experience from one year for first hire to six years for highest level supervisor. There are minimum requirements.

WQCC & WMD - These are generally geology, biology or chemistry professionals.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
_X_yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	OGCC	OGCC
b.	Roadspreading	WMD	WMD
c.	Pits	OGCC	OGCC/WMD
d.	Surface water disposal	WQCC	WQCC
e.	Waste haulers	OGCC (water) WMD (other)	OGCC (water WMD (other)
f.	Burial or landfill	OGCC	OGCC/WMD
g.	Disposal wells	OGCC	OGCC
h.	Enhanced oil recovery injection wells	OGCC	OGCC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OGCC	OGCC
b.	Clean Water Act (NPDES)	WQCC	WQCC
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	WMD	WMD
	Subpart D (Non-Hazardous)	WMD	WMD

3. List any financial assurance requirements for oil and gas exploration and production wastes:

A plugging security of $5,000 per well or $30,000 blanket is required by OGCC on all wells whether producers or injectors.

A bond of $2,000 to $5,000 per well is required for surface restoration on all wells where the surface owner has not made an agreement.

I am not sure of other Divisions financial responsibilities.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Enforcement action is through administrative proceedings for each agency; however, if fines or formal action is required, the attorney general acts as counsel.

A Memorandum of Understanding exists between OGCC and the Colorado District of the U.S. Bureau of Land Management (BLM). This agreement states how federal lands are to be considered in hearings and orders of the Commission. It provides for procedures to be followed by both OGCC and BLM in these situations and calls for regular meetings between the staffs of the two agencies to discuss matters of mutual concern and interest.

Please list the types of enforcement actions available?

1. Contact, explanation and resolution
2. Contact, administrative hearing and resolution
3. Formal hearing before the appropriate board or commission at this level. Fines may be assessed.
4. Action in the District Court.

COLORADO

INTRODUCTION

Colorado has a long history of regulating oil and gas activities. As far back as 1889, Colorado passed a bill prohibiting the discharge of oil, petroleum, or other substances into any waters of the State. In 1927, a second bill was enacted that included provisions for well plugging. In 1951, the Oil and Gas Conservation Act was passed. The Solid Wastes Disposal Sites and Facilities Act was passed in 1973. The Solid Wastes Disposal Sites and Facilities Act (Title 30-20-Part 1, C.R.S. 1973, as amended) also has jurisdiction over oil and gas activities.

In 1985, Colorado produced 30,552,685 barrels of oil from 5,287 wells; 275,684 million cubic feet of gas were produced from 4,665 gas wells. Mud and air drilling are both encountered.

REGULATORY AGENCIES

The three agencies sharing regulatory authority for oil and gas wastes in Colorado are:

* Department of Natural Resources--Oil and Gas Conservation Commission;
* Department of Health; and
* U.S. Bureau of Land Management on Federal Lands only.

The Oil and Gas Conservation Commission has primary responsibility for the management of oil and gas exploration, development, and production activities in Colorado. The Commission is responsible for the conservation of oil and gas and the protection of the rights of all parties. It has general authority to protect the environment from pollution by oil and gas activities on the sites of drilling and production operations. The Commission is also responsible for the regulation and permitting of central disposal facilities operated by the producing companies.

The Colorado Department of Health, specifically the Water Quality Control Division/Commission and the Waste Management Division, has statutory and regulatory authority over solid waste disposal sites and facilities and NPDES permits, and is generally concerned with the endangerment of public health and the environment. Commercial disposal facilities for wastes from oil and gas production operations are subject to the Department's permitting and regulation. In addition, the Department is responsible for permitting of discharges for beneficial use for agriculture and wildlife.

Because the Oil and Gas Conservation Commission (OGCC) and the Department of Health (DPH) share certain responsibilities under their respective statutes, there has been a continuous updating of cooperative understanding. In 1971, upon passage of the Water Quality Control Act and the creation of the Water Quality Control Commission (WQCC) in the DPH, that Commission entered a Memorandum of Understanding in which they designated the OGCC as "its authorized representative to exercise authority for the administration of water pollution prevention, abatement and control required to protect the waters of the State from conditions and activities arising from drilling, production and plugging of wells and all other operations for the production of oil and gas."

Subsequently, upon the amendment of the Colorado Solid Waste Act it became apparent that another area of possible duplication existed in the area of waste disposal. It was agreed between the two agencies that OGCC would administer all activities relating to drilling activities, underground injection based on primacy received from EPA, and the use of earthen pits for the disposal of produced water; and, DPH would administer all commercial facilities, including municipal, waste disposal sites receiving oil and gas production wastes and all wastes deposited on roads.

In 1988, the Legislature passed an Act which required all agencies in the Departments of Health and Natural Resources to enter into Memorandums of Understanding specifically setting forth the responsibility of each agency and providing for regular meetings to discuss administrative technics and the agency's rules and regulations. It was made clear that OGCC would be responsible for administering all oil and gas activities; however, they are to be guided in this administration by the standards and classifications of waters as established by DPH.

As stated, the above establishes the current cooperative arrangements between those states agencies with some responsibility in the area of disposition of exploration and production wastes from oil and gas operations in the State of Colorado.

The U.S. Bureau of Land Management has jurisdiction over Federally-ownded mineral rights. The U.S. Forest Service retains surface rights on Federally-ownded forest and grasslands. EPA retains responsibility for approving underground injection wells on Indian land. The requirements of these agencies are discussed separately in the section on Federal agencies.

STATE RULES AND REGULATIONS

Drilling

Pit Requirements

Oil and Gas Conservation Commission rules require that "before commencing to drill, proper and adequate slush pits shall be constructed for the reception and confinement of mud and cuttings and to facilitate the drilling operation. Special precautions shall be taken to prevent contamination or pollution of state waters."

According to information provided by the Oil and Gas Conservation Commission, most wells are drilled using tanks rather than reserve pits; the reserve pits are used primarily when the mud is displaced during the running of pipe. While no rules prohibit the discharge of produced waters into a reserve pit, this is not commonly done. If the volume of produced water exceeding five barrels/day, this would make the reserve pits subject to the construction requirements and reviews in Rules 325. Otherwise, pits "for temporary storage and disposal of substances produced in the initial completion and testing or workover of wells drilled for oil and/or gas for a period of time not in excess of ninety (90) days" are excluded from application of many of the Rule's provisions.

Most drilling fluids and muds in Colorado are bentonite- and freshwater-based. Very few oil-based drilling fluids are used, and these are moved from operation to operation until disposed of into an approved landfill.

Pit Closure/Discharge

If the well is a dry hole and is abandoned, backfilling of pits and reclamation of the land must be completed within 6 months unless an extension is granted for unusual circumstances (Rule 319(a) (B)).

Generally, after the lighter fluids are decanted in the reserve pits, reserve pit sludges may be dried out and disposed of on the surface by tilling into the ground. The sludge may be removed to a different location before land disposal. The sludge may also be buried when the pit is backfilled. The Commission has permitted one facility for land discharge of wastes with limitations on total suspended solids, total dissolved solids, oil and grease, and chemical oxygen demand.

Produced Waters

Produced water is disposed of through reinjection (approximately 85 percent), placement in storage and disposal pits (approximately 15 percent), and discharge for beneficial use for agriculture and wildlife (<1 percent).

Disposal and Storage Pits

The Oil and Gas Conservation Commission regulates all produced-water storage or disposal pits except for the commercial disposal facilities regulated by the Department of Health. This includes both onsite and central pits. A central pit is a storage or disposal pit serving several leases or batteries in a field, and operated by one of more oil and gas operators under a field operator's agreement approved by the Commission.

Both central and onsite pits are subject to the requirements of Rule 325, which specifies informational, construction, and operating requirements. Minimally, such pits are required to have adequate storage capacity for the volume of produced water expected, and to be kept free of surface accumulations of oil or other hydrocarbons that could impede evaporation. Certain other requirements in the Rule do not apply where the volume of water to be disposed of does not exceed five barrels per day on a monthly basis.

Generally, applicants for permits to construct produced water disposal pits must provide substantial information on surface waters and ground waters, geology, and soil types in the area of the well. The application must also indicate the source and expected volume of water assessing all factors related to salinity. If a pit is located over permeable soil, and will receive, at full capacity, in excess of 100 barrels of fluid/day with a TDS content of 5,000 ppm or more, the operator must provide a plan for lining the pit and detecting leaks. Liners may be required where water placed in the pit has a higher TDS content than underlying aquifers hydrologically connected, regardless of the amount of water delivered to the pit.

The Commission makes a case-by-case determination on lining requirements for all produced-water storage and disposal pits on the basis of site-specific evaluations. According to information provided by the Commission, 90 percent of the pits for wells producing more than five barrels per day of water are required to be lined (approximately two-thirds with clay and one-third with synthetic liners). Of the remaining pits, either the received water is fresh and allowed to percolate, or the pits are over impervious shales and the water evaporates.

Injection

Produced water is reinjected into Class II wells both for enhanced recovery (667 wells) and disposal (134 wells). The UIC Class II injection program has been delegated to the Oil and Gas Conservation Commission.

Wells used for injection into oil or gas producing disposal zones must have "safe and adequate casing or tubing so as to prevent leakage, and shall be so set or cemented that damage will not be caused to oil, gas or fresh water resources." Detailed reports on fluids received and injected must be filed monthly.

Mechanical integrity tests must be performed on new injection wells before starting injection and every 5 years thereafter. The test pressure must be 300 psi or the minimum injection pressure, whichever is greater, and not more than the maximum injection pressure, with a pressure variance of no more than 10 percent. Monthly injection reports are submitted listing volumes injected and injection pressures. All injection facilities are inspected by the Commission staff on a routine basis.

Discharges for Wildlife and Agricultural Use

A few State facilities have permits from the Department of Health for effluent discharges under the BPT Wildlife and Agricultural Use Subcategory. The effluent limitations are:

pH	6.0 to 9.0
Total suspended solids	30 mg/L (30-day average) 45 mg/L (1-day maximum)
Oil and grease	10 mg/L
Total dissolved solids	5,000 mg/L (30-day average) 7,500 mg/L (1-day maximum).

Offsite Disposal

Commercial offsite produced water evaporation or evaporation/percolation pits are regulated by the Division of Waste Management of the Department of Health. According to information provided by the Department of Health, there are currently eight commercial disposal pits, half of which are lined. Lining requirements are determined by classifications of impoundments. Class I facilities (in a recharge area for a drinking water aquifer where seepage from impoundment would impair use of the ground water) require double liners with leak detection systems. Class II impoundments (where seepage would damage a freshwater aquifer if no liner were used) require single liners and monitoring systems. Class II impoundments (those located outside a recharge area, having competent bedrock between the surface and the aquifer, or where impairment would not result from unrestricted seepage) require no liners.

Truckers transporting produced waters to offsite impoundments or injection wells must file monthly reports on the source, volume, and recipient of the waters hauled. Similar records must be kept by the receiving facility. These records will be subject to computerized cross-tabulation.

Plugging/Abandonment

Wells that have ceased production or are incapable of production are to be abandoned within 6 months unless granted an extension by the Director of the Oil and Gas Conservation Commission (Rule 319(b)). In practice, if a well is shut down for economic reasons, the Commission will not require a formerly producing well to be plugged. If, however, the operator of the well has numerous wells that are closed down for economic reasons, and is operating all such wells under a single blanket bond, the Director may require the provision of individual bonds for each well. The operator must file a status report every 6 months indicating plans for future operations.

Wells must be plugged so as to confine oil, gas, or water to the original strata. The operator must obtain approval of the plugging method from the Commission prior to the plugging operation. Surface casing may not be removed from the well unless approved by the Director. Generally, requirements call for the placement of cement plugs of 50 feet above and below each permeable zone, a 100-foot plug at the base of the surface casing, and a cement plug at the top of the surface casing. The operator may plug above perforated zones, or may squeeze with cement prior to abandoning the well or before recompleting into another formation.

References

Colorado Department of Health. Statement of the Colorado Department of Health for the Informational Hearing Regarding Oil and Gas Brine Waste Disposal to the Colorado Water Quality Control Commission. May 10, 1983.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin. Vol XLIV, No. 2. December 1985.

Order 1-39, modifying the Rules and regulations of the Oil and Gas Conservation Commission. Effective August 8, 1986.

State of Colorado. Regulations pertaining to solid waste disposal sites and facilities. Effective Date: October 1, 1984.

State of Colorado. Department of Natural Resources. Oil and Gas Conservation Commission. Rules and regulations, rules of practice and procedure, and Oil and Gas Conservation Act (As Amended). Effective July 16, 1984.

USEPA. 1985. U.S. Environmental Protection Agency. Colorado Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communication:

William R. Smith, Oil and Gas Conservation Commission (303) 866-3531.

STATE: Florida

AGENCIES: Department of Natural Resources (DNR) - on-site
Department of Environmental Regulation (DER) - off-site

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DNR-DER) -
Roadspreading - (DER) -
Pits - (DNR) -
Surface water discharge - (DNR-DER) - Does not have NPDES primacy.
Waste haulers - (DNR-DER) -
Burial or landfill - (DNR-DER) -
EOR/injection wells - (DNR) - Does not have UIC primacy. All drilling and production fluids reinjected.

BONDING: Compliance bond required. Bond is conditioned upon restoration of drill site, compliance with rules and regulations, and plugging and abandonment. Bond amount depends on well depth and ranges from $50,000 to $200,000 per well. Blanket bond amount is $1,000,000.

ENFORCEMENT: Enforcement through administrative proceedings with the ability to seek civil penalties. Did not indicate criminal actions.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Florida

Forms completed by: Dr. Charles H. Tootle, etal

Agency: Florida Department of Natural Resources (DNR)
Phone: (904) 487-2219

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Florida DNR

Off-site disposal: Dept. of Environmental Regulation (DER)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Legislatively mandated responsibilities. No overlap. DNR jurisdiction ends at edge of wellsite.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   5; no separate budget

2. Legal support; and

   1; no separate budget

3. Permitting, siting, and administration.

   4; no separate budget

Please indicate, for each agency above, what type of training is needed for your staff.

Degree in petroleum engineering and geology and relevant work experience. (DNR)

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

Plugging/Abandonment procedures revised in June, 1989. Revised paragraph included in this report.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DNR (pad area only)	DER
b.	Roadspreading	n/a	DER
c.	Pits	DNR	n/a
d.	Surface water disposal	DNR	DER
e.	Waste haulers	DNR	DER
f.	Burial or landfill	DNR (pad area only)	DER
g.	Disposal wells	DNR	n/a
h.	Enhanced oil recovery injection wells	DNR	n/a

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	not delegated to Florida	not delegated to Florida
b.	Clean Water Act (NPDES)	none	none
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DER	DER
	Subpart D (Non-Hazardous)	DER	DER

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Surety bond or letter of credit:

Well depth	Well status	Amount
0 - 9000 ft.	Drilling	$ 50,000
9000+ ft.	Drilling	$100,000
0 - 9000 ft.	Producing	$100,000
9000+ ft.	Producing	$200,000

Blanket security for multiply wells: $1,000,000

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

DNR initiates enforcement actions through administrative procedings. There are no relevant mou's between DNR and other agencies.

Please list the types of enforcement actions available?

Revoke permits and possible fines.

FLORIDA

INTRODUCTION

Florida produced 7,289,390 barrels of oil and 8.8 x 10^9 cubic feet of gas in 1989. Production was from 99 oil wells; there are no producing gas wells. Virtually all drilling fluids as wells as produced fluids are injected.

REGULATORY AGENCIES

The four agencies responsible for regulating the oil and gas industry in Florida are:

* Florida Department of Natural Resources, Division of Resource Management, Florida Geological Survey;
* Florida Department of Environmental Regulation;
* Florida Regional Water Management Districts; and
* U.S. Environmental Protection Agency, Region IV.

Primary regulatory responsibility rests with the Department of Natural Resources (DNR). DNR is the permitting agency for oil and gas wells, including approval to dispose of waste fluids by subsurface injection. The DNR regulates the exploration, drilling, and production of the oil and gas industry with respect to reporting, spacing, safety, and construction.

The Department of Environmental Regulation oversees the industry with regard to water quality standards and dredge and fill requirements (for pits) if oil and gas activities occur in wetlands of the State.

UIC permits for other than Class II wells are issued pursuant to Chapter 403, Florida Statutes, and Chapter 17-28, Florida Administrative Code. If applicable, dredge and fill activites are regulated under Chapter 403, Florida Statutes, and Chapter 17-22, Florida Administrative Code. Water standards are issued under Chapters 17-3 and 17-4, Florida Administrative Code. Water management licenses (consumptive use) are issued under Chapter 373, Florida Statutes, by the regional Water Management Districts.

Plugging/Abandonment

1. Oral approval to plug and abandon may be granted by the Department's agent. Equipment shall be removed and the well site shall be properly reclaimed immediately after plugging operations are completed on any well.

2. An agent of the Department may inspect the work of abandonment as it progresses, including checking the location and quantity of plugs, the amount of casing pulled, and the demonstration of movement, if any, of oil, gas, or water.

3. Wells intended for possible future use for saltwater disposal or secondary recovery operations shall be handled in accordance with 16C-27.0015(2).

4. The drilling of a well may not be suspended without prior approval of the Department as specified in 16C-27.0015(1). Any well on which unapproved suspensions are in progress shall be considered to be an abandoned well, and shall be plugged in accordance with these rules.

5. Pulling of Casing from an Abandoned Hole. Before pulling casing from an abandoned hole, the operator shall obtain approval from the Department for reentry into the well. All requests to pull casing shall contain:

    a. A diagram showing the casing in place and the depth at which casing is to be cut and recovered.

    b. The procedure to be followed to protect freshwater resources.

    c. The proposed schedule of plugging the well.

    d. Bond coverage and other requirements may apply.

6. The operator shall provide the agent of the Department with at least twenty-four hours notice prior to commencement of any plugging operation and thereafter as instructed. All applicable safety considerations referenced in 16C-29.006 shall apply.

7. Permanent Abandonment. The Department recognizes that no single plugging and restoration schedule can suffice for all wells. However, the following criteria will apply to most wells; others shall be handled in accordance with 16C-25.007.

   a. Uncased-hole plugs: Cement plugs shall be placed in uncased portions of wells as necessary to prevent the migration of formation fluids from one zone to another. These plugs shall be placed in accordance with the following criteria.

      1. All nonproductive intervals containing shows of hydrocarbons shall be isolated from the wellbore by placing a minimum cement plug of 200 feet in length across the showing interval. Such plugs shall extend from 100 feet below to 100 feet above the show and shall be verified by either tagging with 15,000 pounds of drill stem weight or pumping sufficient excess cement to guarantee proper placement.

      2. All nonproductive intervals which are productive within 5 miles of the well being plugged shall be isolated and verified in accordance with (a)1. above.

      3. All flows of saltwater requiring 12 or more pounds per gallon to control shall be isolated as in (a)1. above and the plugs verified by tagging with 15,000 pounds of drill stem weight.

      4. Underground Storage of Drinking Water shall be isolated from adjoining saline zones by a minimum cement plug of 400 feet extending from 200 feet below to 200 feet above the base of USDW. Such plugs shall be verified by tagging with sufficient drill stem weight to guarantee proper placement of the plug.

      5. Freshwater zones shall be isolated from nonfreshwater zones as in (a)4. above and the plugs verified in a like manner.

      6. All intervals between any of the above plugs may be filled with drilling fluid.

   b. Cased Hole Plugs:

      1. Perforated interval plugs: No perforation shall be permitted to remain open upon abandonment. Either a cement retainer shall be set a minimum of 100 feet above the open perforation interval with cement squeezed into the perforation interval and 50 feet of cement placed on top of the retainer, or a 200 foot cement plug placed to extend from 100 feet below to 100 feet above the perforations. If a cement retainer is not used or does not hole pressure, this plug shall be verified by either tagging with 15,000 pounds of drill stem weight or by utilizing an amount of cement 100% in excess of that needed for the 200 foot plug. If cement can not be squeezed below a properly operating cement retainer, then a 200 foot cement plug shall be set on top of the retainer.

      2. Casing Seat Plugs: Where there is open hole below any casing seat, a cement plug shall be placed at the base of the string, extending at a minimum from 150 feet below to 150 feet above the casing shoe. If a cement retainer is used, it should be set not less than 50 feet nor more than 100 feet above the casing shoe and the cement plug placed so that it will extend at least 100 feet below the casing shoe and 100 feet above the retainer. If a retainer is not used or fails to hold pressure, the plug shall be verified by tagging with 15,000 pounds of drill stem weight. In the event lost circulation conditions were encountered immediately below the casing shoe so that any attempted casing seat plug would be lost to the formations below, a permanent type bridge plug shall be set within 100 feet of the casing shoe and 200 feet of cement placed on top of the bridge plug. Regardless of the method used to set this plug, the pipe, unless it is to be cut and recovered, shall be tested by placing on it a minimum pump pressure of 1000 psig. No more than a 10% pressure drop during a 30 minute test period shall be allowed. If this test fails, necessary remedial measures shall be taken and the pipe retested and plugged in accordance with (a)4. above.

3. Casing-Stub Plugs. When casing is cut and removed, a cement plug 200 feet in length shall be placed at the base of the cut so that the plug extends from 100 feet below to 100 feet above the stub. This plug shall be verified as directed by the Department's agent.

c. Up Hole Plugs:

1. USDW Plugs. All casing strings not cemented to the surface shall be cut not less than 200 feet below the base of the deepest USDW and pulled out of the hole. A cement plug shall then be set across the USDW as described in (a)4. above. If the casing seat depth exceeds the required plug depth and can not be cut and pulled out of the hole, then the plug shall be set inside the casing.

2. Freshwater Plug. A cement plug shall be set across the freshwater interval as described in (a) 5. above. If the surface casing seat depth exceeds the required plug depth, then the plug shall be set inside the surface casing.

3. Annular Space Plugs. No annular space connecting saline water intervals with freshwater intervals or the surface with the drilled hole below shall be allowed to exist. If such space exists it shall be destroyed by cutting and recovering the necessary casing strings as described in (c)1. above. In the event that it is physically impossible to recover such casing, the operator shall devise an alternate method to accomplish the same result. Such alternate methods must have prior approval of the Department's agent.

4. Surface Plug. A 100 foot cement plug shall be placed in the top of the largest string of pipe cemented to the surface. This plug shall extend from the top of the casing downward the required distance. A 1/2 inch thick steel plate shall be welded across the top of the casing.

d. Restorage of location.

1. Mud pits. All fluids and recoverable slurry that remain in the pits shall be either returned to the well bore below all USDW during the process of plugging, placed between plugs in the casings, or removed to an approved land fill.

2. Drilling sites. The operator shall remove all waste, debris, and equipment from the site without undue delay, and shall undertake such restoration of the site as is necessary to protect the site, adjoining areas, and the natural resources. Land drilling sites shall be restored to the approximate original contour of the surface. All access roads constructed for the purpose of site access shall be removed and the area restored to the approximate original contour of the land. The operator, with written consent of the landowner, may request in writing an exception to this procedure. The Department's agent may allow temporary stacking of equipment to assist in the orderly development of a drilling program.

3. Uplands and Wetlands. All casing shall be cut off at least four feet below ground surface.

4. Submerged lands. All casing and piling shall be severed and removed to at least 15 feet below the water-bottom surface of submerged land. The water bottom shall be dragged to clear the well site of any obstructions.

8. Temporary Abandonments. Any well which is to be temporarily abandoned shall be plugged in accordance with 16C-27.0015.

Specific Authority 377.22 FS.
Law Implemented 377.22, 377.24 FS.
History - New 11-26-81, Amended 4-12-83, 6-5-89.

16C-29.010 Plugging Completion and Site Restoration Report (Form No. 16). Within 25 days after the plugging of any well has been completed, the operator shall file Form No. 16 with the Department setting forth in detail the method used in plugging the well, and shall include a detailed description of the restoration as performed.

Specific Authority 377.22 FS.
Law Implemented 377.22 FS.
History - New 11-26-81, Amended 6-5-89.

16C-29.011 Final Inspection.

1. A final inspection by an agent of the Department is required for each site that has been restored before the operator may be relieved of the liability of the requirements under these rules.

2. The inspection will be made at the request of the operator upon completion of restoration.

Specific Authority 377.22 FS.
Law Implemented 377.22 FS.
History - New 11-26-81.

References

Griffin, Lynn. Environmental Specialist. Department of Environmental Regulation. Letter to W.A. Telliard, EPA, March 22, 1985.

State of Florida regulatory and review procedures for land development. Chapter 14. November 1, 1984.

Wise, Lloyd. Region IV NPDES permit writer. 1985. Summary of EPA workshop presentation, Onshore Oil and Gas Workshop Meeting Report, July 1985.

Personal Communications:

David Curry, Florida Department of Natural Resources (904) 487-2219.

Lynn Griffin, Environmental Specialist, Department of Environmental Regulation, October 2, 1986 (904) 488-8615.

STATE: Illinois

AGENCIES: Department of Mines and Minerals (IDMM)
Illinois Environmental Protection Agency (IEPA)

MOU: Yes, with the Illinois Environmental Protection Agency and the Emergency Services and Disaster Agency.

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Not allowed.
Roadspreading - Not allowed.
Pits - (IDMM) - Reserve pits permitted. No liner required. No testing requirements prior to pit closure. Permit lined produced water collection pits. No commercial pits.
Surface water discharge - (IEPA) - Not allowed.
Waste haulers - (IEPA) -
Burial or landfill - (IEPA) -
EOR/injection wells - (IDMM) - All salt water is injected. Produced water records are kept by the producer.

BONDING: Compliance bond required. Bond conditioned upon proper plugging and restoration upon abandonment. Bond amount is $2,500 per well or blanket bond of $25,000.

ENFORCEMENT: After January 10, 1990, the Department of Mines and Minerals will have authority to administrate fines and cessation orders.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Illinois

Forms completed by: John H. Morgan

Agency: Illinois Dept. of Mines & Minerals (IDMM), Oil & Gas Division
Phone: (217) 782-7756

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Dept. of Mines & Minerals

Off-site disposal: Dept. of Mines & Minerals

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Primary responsibility for exploration and production wastes belongs to the Dept. of Mines & Minerals; however, the Illinois Environmental Protection Agency (IEPA) and the Emergency Services and Disaster Agency (ESDA), through a memorandum of understanding, are secondary response agencies. The U.S. Environmental Protection Agency (USEPA) has granted primacy for the Underground Injection Control program (UIC) for Class II wells.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

(for Illinois, the agency is the Oil and Gas Division)

1. Enforcement, field monitoring and inspection;

   22 field inspectors

2. Legal support; and Illinois Attorney General

   3 attorneys

3. Permitting, siting, and administration.

   10 employees including a staff of 7 with the UIC program

Please indicate, for each agency above, what type of training is needed for your staff.

The UIC staff has 2 engineers, 2 geologists, 1 hydrologists, 1 compliance manager, and a manager who is a geologist. The staff has support from 3 attorneys, 1 administrative assistant, a water well section with one on staff, a secretary, and five in the clerical pool. The professional and technical staff is college trained; the remainder receive training on the job.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

	Disposal on-site	Disposal off-site
a. Landfarming	n/a	n/a
b. Roadspreading	n/a	n/a
c. Pits	IDMM	IDMM
d. Surface water disposal	IEPA	IEPA
e. Waste haulers	IEPA	IEPA
f. Burial or landfill	IEPA	IEPA
g. Disposal wells	IDMM (Class II)	IDMM (Class II)
h. Enhanced oil recovery injection wells	IDMM	IDMM

Note: The Class I wells and the Class V wells are regulated by the IEPA.

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

	Disposal on-site	Disposal off-site
a. Safe Drinking Water Act (UIC)	IDMM	IDMM
b. Clean Water Act (NPDES)	IEPA	IEPA
c. Resource Conservation & Recovery Act (RCRA)		
Subpart C (Hazardous)	IEPA	IEPA
Subpart D (Non-Hazardous)	IEPA	IEPA

3. List any financial assurance requirements for oil and gas exploration and production wastes:

A brine hauling section requires a bond for each brine haulers permit totalling $10,000; a surety bond for each Class II well of $2,500 (a blanket bond of $25,000) but only for the eventual plugging and restoration.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The MOU with the IEPA and ESDA are being rewritten and are not yet available. After January 1, 1990, the IDMM will have the authority to administrate fines and cessation orders.

Please list the types of enforcement actions available?

ILLINOIS

INTRODUCTION

Illinois produced 22,476,000 barrels of oil and 1,337,848 mcf of gas in 1988. Production is from 28,920 oil wells and 293 gas wells. Nineteen barrels of brine are produced for every barrel of oil. Thirteen thousand injection wells are operating in the State.

REGULATORY AGENCIES

Principally, one agency regulates the oil and gas industry in Illinois:

* Department of Mines and Minerals, Division of Oil and Gas.

The Department of Mines and Minerals operates under an Act in Relation to Oil, Gas, Coal and Other Surface and Underground Resources. Section 8A of the Act provides the Department with the power and authority to regulate the disposal of salt- or sulphur-bearing water and any oil field waste produced in the operation of any oil or gas well, and to adopt related rules and regulations. Section 8B provides that no person shall drill, convert, or deepen a well for the purpose of injecting gas, air, water, or other liquid into any underground formation or strata without first securing a permit. Section 8C(A) states that no person shall operate an oil field brine transportation system without an oil field brine transportation permit. Section 8G(3) specifies that the permittee shall not dispose of oil field brine onto or into the ground except at locations specifically approved and permitted by the Department of Mines and Minerals. No oil field brine shall be placed in a location where it could enter any public or private drain, pond, stream, or other body of surface or ground water.

The Division of Oil and Gas has UIC program primacy for Class II wells. While there are Federal lands in Illinois, there is no drilling or production on these lands at present. The Illinois Environmental Protection Agency has been delegated NPDES authority; however, no surface water discharges from the oil and gas industry are allowed.

STATE RULES AND REGULATIONS

Drilling

Before a new well is drilled, the operator must execute a bond of $2,500 unless the operator already has a blanket bond of $25,000. The bond is cancelled only after the well has been plugged and all related restoration activities have been completed.

There are no State requirements that drilling pits be permitted or lined. Fluids from the pits may be disposed of in a dry drill hole. When the pit mud dries, the pit is backfilled and reclaimed. Pits must be reclaimed within 6 months after drilling ceases.

Production

Produced waters go into lined holding ponds and plastic-lined tanks and are reinjected into certified injection wells. If pits are used, the lining must be an impermeable material that will prevent seepage. Most requests are for fiberglass- or concrete-lined pits. Earthen-lined pits have been substantially eliminated during the past 5 years. The Department of Mines and Minerals has been reducing the number of old pits by removing and injecting the produced waters, stabilizing the contents, applying topsoil, and vegetating the pit area.

Neither roadspreading nor landfarming is allowed.

Thirteen thousand injection wells for disposal or enhanced recovery ar operating in Illinois, of which the majority are water flooding wells. Permits for injection wells must be obtained from the Division of Oil and Gas. The permit application must include the location and depth of any existing wells within one-half mile of the proposed new or converted injection well, as well as information to show that injection into the proposed zone will not initiate fractures through the overlying strata which would enable injection or formation fluids to enter freshwater strata. Injection must be through adequate tubing and packer.

A mechanical integrity pressure test must be carried out before injection is initated. Thereafter, the well must be tested at least every 5 years (or, alternatively, monthly records of actual injection pressure in the casing-tubing annulus may be reported annually). Test pressures for new wells must be at 300 psi or the maximum authorized injection pressure, whichever is greater. The same range applies for newly converted wells or for retests, except that the ceiling is 1,000 psi.

Offsite Disposal

Offsite or commercial pits are not used in the State of Illinois. Brines may be transported offsite to injection wells. Transporters must have oil field brine hauling permits. Well operators must maintain detailed records of all brine removed from their leases and of the haulers contracted for the removal.

Plugging/Abandonment

A well must be plugged within 30 days of the cessation of drilling operations if no production casing has been run. Wells at which there have been no production operations for 6 months must be plugged unless the operator has been granted an extension. Requests for extensions will be granted by the Mining Board for good cause so long as all casing remains sound and in the well. The length of the extension is for one year. When an extension is granted, a bond is required from the operator if no bond covering the well is in effect. This bond remains in effect until the well is plugged. If, at expiration of the extension, the Mining Board denies a further extension, the well must be plugged and abandoned.

When plugging, cement plugs must be placed opposite any producing formation and extend 20 feet above the formation. Cement plugs must also be placed from 50 feet below to 100 feet above any coal seam thicker than 30 inches, from 20 feet below to 20 feet above the casing seat of the oil string, and from 10 feet below to 15 feet above the base of the surface casing. If the surface casing was not used, a 25-foot plug must be used below the surface with a 1-foot mushroom cap. Where a surface casing was used, the casing must be cut off 3 feet below the ground and a 1-foot cap should be added. Mud must fill the remainder of the well. There are no specific provisions for plugs over zones with potable water.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

State of Illinois. 1984. An act in relation to oil, gas, coal and other surface and underground resources. Revised edition.

_____. 1984. Rules and regulations. Department of Mines and Minerals, Division of Oil and Gas. Revised edition.

USEPA. 1985. U.S. Environmental Protection Agency. Illinois Meeting Report. Proceedings of the Onshore Oil and Gas Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communication:

John H. Morgan, Division of Oil and Gas (217) 782-7756.

STATE: Indiana

AGENCIES: Department of Natural Resources (IDNR)
Division of Oil and Gas
Department of Environmental Management (IDEM)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (IDEM) -
Roadspreading - (IDNR) - Regulated off-site by county officials.
Pits - (IDNR) - Reserve pit standards include closure within 60 days. Production pits must be lined.
Surface water discharge - (IDNR) - NPDES primacy state.
Waste haulers -
Burial or landfill - (IDEM) -
EOR/injection wells - (IDNR) - UIC primacy state. All production fluids reinjected.

BONDING: Compliance bond required. Bond is conditioned upon restoration of surface to its former condition and plugging of the well. Bond amount is $2,000 per well or blanket bond of $30,000.

ENFORCEMENT: Administrative proceedings are used for all enforcement unless confronted with an emergency. Enforcement may be through notice of violation, assessment of penalties, revocation of permits, and bond forfeitures. Civil and criminal enforcement is available.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Indiana

Forms completed by: Gary M. Fricke and
Michael P. Nickolaus

Agency: Indiana Dept. of Natural Resources (IDNR), Division of Oil & Gas
Phone: (317) 232-4055

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: IDNR
Division of Oil & Gas

Off-site disposal: IDNR
Division of Oil & Gas

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

None

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   1 Assistant Director $450,000
   1 Field Supervisor
   12 Field Inspectors

2. Legal support; and

   None

3. Permitting, siting, and administration.

   1 Assistant Director $300,000
   2 Petroleum Geologists
   2 Secretaries

Please indicate, for each agency above, what type of training is needed for your staff.

For the technical staff, training in the following areas is needed:

1. Well construction technology
2. Hydrology
3. Geophysical logging
4. Geologic data interpretation
5. Contamination investigation techniques
6. Water sampling and analysis
7. Mechanical Integrity Testing

For the administrative staff, training in the following areas is needed:

1. Word processing
2. General oil field terminology
3. Organizational skills

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	IDEM	IDEM
b.	Roadspreading	IDNR	Local County Commissions
c.	Pits	IDNR	IDNR
d.	Surface water disposal	IDNR	IDEM
e.	Waste haulers	n/a	n/a
f.	Burial or landfill	IDEM	IDEM
g.	Disposal wells	IDNR	IDNR
h.	Enhanced oil recovery injection wells	IDNR	IDNR

(IDNR - Indiana Department of Natural Resources)
(IDEM - Indiana Department of Environmental Management)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	IDNR	IDNR
b.	Clean Water Act (NPDES)	IDEM	IDEM
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	IDEM	IDEM
	Subpart D (Non-Hazardous)	IDEM	IDEM

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Surety bonding in the amount of $2,000 per well or blanket bonding in the amount of $30,000 for all wells listed under a single operator.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

With the exception of emergency situations, enforcement proceedings are administrative and most conform to the Administrative Adjudication Act (IC 4-21.5)

Please list the types of enforcement actions available?

1. Notice of Violation
2. Penalty Assessments
3. Permit Revocations
4. Bond Forfeitures
5. Civil Suits
6. Criminal Prosecution

INDIANA

INTRODUCTION

Indiana produced 3,574,915 barrels of oil and 411,647,000 cubic feet of gas in 1988. Production was from 7,543 oil wells and 776 gas wells.

REGULATORY AGENCIES

The two agencies that principally regulate oil and gas activity in Indiana are:

* Indiana Department of Natural Resources, Division of Oil and Gas; and
* U.S. Environmental Protection Agency, Region V.

The Indiana Division of Oil and Gas regulates the industry through Rules 310 IAC 7-1 and 310 IAC 7-1.5. No discharge to surface waters is allowed so that any involvement of the Indiana Department of Environmental Management would occur only as a result of the improper disposal of oil and gas wastes. Any concerns that owners of Federal lands may have regarding oil and gas surface treatment are satisfied through the conditions of the respective lease agreements.

The Oil and Gas Division does not have primacy for UIC program Class II wells; however, the State is in the process of attaining such status. Currently, anyone interested in underground injection must obtain two permits--one from the State and one from the U.S. Environmental Protection Agency.

STATE RULES AND REGULATIONS

Drilling

Adequate pits are required for muds or wastes associated with drilling operations. Drill pits must be reclaimed within 60 days after drilling has stopped. Fluids associated with such drill pits generally can be classified as fresh water and are mixed with bentonite clays. When a pit is closed, the practice is to pump the small amount of fluid in the pit to the surrounding land, bury the drill cuttings and other pit muds, and reclaim the land.

Production

Pits used for gathering production fluids and storing them until reinjection must be lined with impervious clay or an artificial liner. All production fluids must be reinjected underground. Evaporation pits were disallowed by the State 4 years ago.

Plugging/Abandonment

Any well that is not operating must be capped and sealed immediately and a temporary abandonment permit sought. If not placed back in operation within 2 years, the operator may be required to plug and abandon the well, to recase the well, or to demonstrate (through pressure testing or another approved method) that the well casing is in good condition and there is no commingling of fluids.

When the well is plugged, cement plugs are required from 50 feet below (or from the bottom of the well) to 100 feet above any stratum with oil, gas, or commercial deposits of coal. Where insufficient casing is set or surface casing was not cemented to the surface, production casing should be removed from 50 feet below the deepest aquifer containing potable water, and a cement plug should be placed from the remaining production string to 3 feet below the surface. In the case of a dry hole that has not encountered coal, a similar surface plug may be placed after filling the hole from the bottom with mud. The use of bridges is prohibited.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

Personal Communication:

Mike Nickolaus, Indiana Division of Oil and Gas (317) 232-4055.

STATE: Kansas

AGENCIES: * Kansas Corporation Commission (KCC)
Kansas Department of Health and Environment (KDHE)

MOU: Yes (primarily covering remediation at contamination sites)

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Not addressed, therefore, not permitted.

Roadspreading - (KCC-KDHE) - Roadspreading produced water permitted. KCC does allow for spreading of oil and some produced water on lease roads. KDHE gives single instance permits to county engineers for spreading of brine on specific mile segments of roads.

Pits - (KCC) - Permits required by KDHE from 1957-1986 and by KCC from 1986 to present. Liners not required unless Commission determines necessary. No testing prior to closure. Emergency pits and reserve pits permitted.

Surface water discharge - Not allowed except through Kansas NPDES permit.

Waste haulers - (KCC-KDHE) - Oil field brine hauler licensed through KCC Transportation Division. Waste haulers licensed by KCC but cradle to grave waste disposal enforcement by KDHE.

Burial or landfill - (KCC-KDHE) - KCC (insitu burial); KDHE (landfill)

EOR/injection wells - (KCC) - 99.9% of produced water injected. (62% to deep gravity SWD's; 38% to EOR projects)

BONDING: No bond or type of financial assurance required.

ENFORCEMENT: Actions include administrative penalties, suspension or revocation of operator license, well shut down, pipeline severance, notices of non-compliance, and authority to correct problems and seek reimbursement.

COMMENTS: Have a general no-pollution standard.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Kansas

Forms completed by: William R. Bryson

Agency: Kansas Corporation Commission (KCC)
Phone: (913) 271-3233
(Shari Albrecht may also be contacted at (316) 263-3238)

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: KCC
(all oil and gas E&P wastes) except discharge to drainage through NPDES which is under KDHE Bureau of Water Quality

Off-site disposal: KCC
(transfer offsite of produced water)
(offsite burial of drilling mud, reserved pit

KDHE
(landfill, roadspreading)

(KDHE - Kansas Dept. of Health & Environment)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

(1) Legislatively mandated cooperation on all matters pertaining to cleanup of E&P waste released to the environment or water resources.

By MOA--KCC has exclusive jurisdiction of E&P waste originating on active leases (includes TA'd leases, and spill resonse). KDHE has lead on all groundwater contamination on leases which have been abandoned and plugged. (Lead to KDHE Bureau of Environmental Remediation.)

(2) Offsite disposal activities are broken down into responsibility based roughly on permitting.

KCC--Class II primacy under SDWA Section 1425 (produced water SWD and transport to other EOR). Regulated offsite disposal of solid waste (on other leases).
KDHE--Regulated landspill disposal of solid waste (drilling mud and reserve pit) by Kansas statute. Brine spreading regulated by KDHE under regulations.

(3) KDHE has EPA primacy for spill program under CWA. MOU with KCC delegates lead for spills or releases originating on oil and gas leases regulated by the Commission.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

KCC is a quasi judicial agency headed by a three member commission whose chairman is elected by the commission members. (independent) KDHE is a cabinet level department whose head is a secretary appointed by the governor.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

KCC Conservation Division Budget for salaries $2,724,632 and $825,000 for other except capital outlay. Approximately .70% of all expenditures are related to environmental activities.

1. Enforcement, field monitoring and inspection;

   (KCC only) 38 Petroleum Industry Regulatory Technicians (PIRT's) supervised by 4 environmental geologists. Enforcement also involves legal staff and those shown under 3. - 70% of total. Additionally, each of the four KCC districts has an environmental geologist assigned to groundwater contamination site investigations.

2. Legal support;

   Three attorneys assigned to Conservation Division Director is also an attorney. Rough Budget Estimate $100,000 -$110,000/year. Mostly salaries and 5% some travel.

3. Permitting, siting, and administration; and

   Environmental Geologists (5), plus-support staff of 12. Support staff includes research analysts and clerical. 25%

4. Plugging fund.

   $500,000 allocated/year

Please indicate, for each agency above, what type of training is needed for your staff.

Staff training consists of formal presentation on hydrogeology, enforcement, well completion and plugging, UIC and regulatory approach.

PIRT's (Technicians) - Minimum graduation from high school with training in oilfield work. Level of work depends upon extend of training.

Environmental Geologists - Graduation from 4 year college in geology, hydrogeology, or related field with minimum of 3 years experience. MS degree sub for one year.

Attorneys - Degree in law

Research Analysts - Degree from 4 year college and experience sub 15 hrs/year. Concentrated study in math, statistics, or science.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

	Disposal on-site	Disposal off-site
a. Landfarming	not addressed in either KCC or KDHE, therefore, currently prohibited	not addressed in either KCC or KDHE, therefore, currently prohibited
b. Roadspreading	KCC on lease roads only	KDHE (regulations)
c. Pits	KCC	no commercial pits (prohibited)
d. Surface water disposal	KDHE (NPDES)	KDHE
e. *Waste haulers	KCC KDHE (if waste is hazardous)	KDHE (except produced water)
f. Burial or landfill	KCC	KDHE
g. Disposal wells	KCC	**KCC if Class II
h. Enhanced oil recovery injection wells	KCC	n/a

*KCC licenses waste haulers under transportation division.

**no commercial disposal wells in Kansas except infield hauling or community disposals.

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

	Disposal on-site	Disposal off-site
a. Safe Drinking Water Act (UIC)	KCC	KCC
b. Clean Water Act (NPDES)	KDHE	KDHE
c. Resource Conservation & Recovery Act (RCRA)		
Subpart C (Hazardous)	KDHE	KDHE
Subpart D (Non-Hazardous)	KDHE (if not E&P waste) KCC (if E&P waste)	KDHE unless transported to a KCC permitted facility

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Kansas Oil and Gas Statutes do not provide for bonding of operator or wells at any time during the life of the lease. This would include CD's, Letter of Credit in addition to bonds. Operators are assessed a fee/barrel of oil and/mcf of gas which goes into a conservation fee fund. KCC begins each fiscal year with a balance of $500,000 to plus abandoned wells or to remediate those wells where plugs fail. KCC institutes legal action to recover some costs of plugging from violators. Kansas does license operators and those with poor performance or numerous violations may be hauled in to show cause why the license should not be revoked or suspended.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

All enforcement actions by KCC subject to appeal and hearing. KCC actions are generally through administrative proceedings which are eventually ruled on and enforced as Commission orders. The Commission legal staff develops enforcement cases and represents the public in presenting to the Commission. Most Commission actions are res judicata; however, appeal of a decision is always available in the courts.

Please list the types of enforcement actions available?

1. Administrative penalties up to $10,000/day after issuance of enforcement orders (environmental fines automatically)
2. Suspension of revocation of operator license (includes anyone who drills or works on well except service companies.)
3. Well shut down
4. Pipeline severance
5. Field office notice on non-compliance to operator
6. KCC authority to act on its own to correct problem and seek reimbursement from operator (well plugging and remediation)

KANSAS

INTRODUCTION

Kansas produced 58,824,000 barrels of oil and 580.9 x 10^9 cubic feet of gas in 1988. Production is from 57,633 oil wells and 12,680 gas wells. Kansas ranks seventh in both U.S. oil production and U.S. gas production. There are 17,000 injection wells in the State.

REGULATORY AGENCIES

One agency regulates oil and gas activities in Kansas:

* Kansas Corporation Commission.

On July 1, 1986, by passage of House Bill 3078, the Kansas Legislature trasnferred the Department of Health and Environment's regulatory responsibilities for oil and gas activities to the Kansas Corporation Commission. Prior to that date, the Department of Health and Environment had responsibilities related to lease maintenance, emergency pits, drill pits, burn pits, storage ponds, and Class II oil field produced water and enhanced recovery injection wells. Under Kansas' Statutes (Chapter 55, Article 10, 55-1003) plans and specifications for the disposal of oil and gas produced waters and mineralized waters were to be submitted to and approved by both the State Corporation Commission and the Secretary of Health and Environment. Subsequent to the 1986 legislative action, the Secretary of Health and Environment no longer is a part to such action.

There are few Federal lands and little involvement of Indian tribes in the Kansas oil and gas industry. When an application for a permit to drill has been received, notice is published routinely inlocal news outlets. If requirements are specified by the Bureau of Land Management or Indian tribes, they are communicated directly to the driller through lease agreement conditions or by other legal means.

STATE RULES AND REGULATIONS

Drilling

The industry is regulated through the issuance of drilling and well operation permits. A compliance or surety bond is not required. With the recent departmental transfer of responsibilities, the Corporation Commission has revised and implemented regulations pertaining to those activities formerly administered by the Secretary of Health and Environment. None of these regulations, however, have to do with the drilling of the well except for a generalized requirement that drilling and reserve pits "shall not cause pollution" to water resources.

Pit Requirements

Until May 1987, drilling pits and burn pits were permitted and regulated under a general rule for a maximum period of 365 days unless the operator requested and received approval for an extension. A separate permit application was not required. Drilling pits may be used to temporarily confine "salt water, oil or refuse resulting from oil and gas activities during the drilling, completion or testing of any oil, gas, exploratory, wildcat, service or storage wells." Permits were required for emergency pits beginning in 1984.

Liners are not required for drilling pits unless the Commission determines that a liner is necessary to protect soil or water resources in geologically or hydrologically sensitive areas. In such areas, liners or portable pits may be required. In areas with sandy soils, for example, drilling pits must be lined. In the heavy clay region of the north-central portion of the State, however, such pits most likely would not be lined. Liners will also be required in areas where the drilling process penetrates the 300' thickness of the wellington salt.

Pit Closure

Onsite burial, after evaporation or mechanical dewatering, is the primary method of pit closure. After May 1, 1987, backfilling is required "as soon as practical or as required by the commission" after abandonment. Most lease agreements already contain such a requirement. Landfarming is prohibited. In geologically or hydrologically sensitive areas, in situ disposal of drilling pit contents can be prohibited.

Produced Waters

Injection

Ninety-nine percent of produced water is disposed of into injection wells for enhanced recovery (11,000 wells) or for saltwater disposal (5,536 wells). The Kansas Corporation Commission has primacy for the UIC Class II program. Operators may inject produced salt water into enhanced recovery or disposal wells after receiving approval of their applications from the Commission. Water injected into disposal wells may be returned to any mineralized water-bearing formation that is not oil or gas producing in the area of the proposed disposal, or to other subsurface water-bearing formations that contain or previously produced salt water or mineralized water exceeding 10,000 mg/L TDS. Enhanced recovery and waterflood injection wells must return water to an oil-producing zone, but not necessarily to the one from which it originated.

All injection and disposal wells requiring wellhead pressure to inject fluids must inject through tubing under a packer set immediately above the uppermost perforation or open-hole interval. The annulus between the tubing and the casing should be filled with a corrosion-inhibiting fluid or hydrocarbon liquid. Packerless or tubingless pressure completions may be authorized under special conditions. (For example, disposal through tubing without a packer must, among other requirements, have no surface wellhead pressure.) Wells must be caed and cemented in such a manner as to prevent damage to hydrocarbon sources or fresh and usable water sources.

Mechanical integrity tests must be conducted before injection begins and at least every 5 years thereafter. Packerless wells should be tested using a retrievable plug immediately above the uppermost perforation or open-hole zone. The test pressure must be 100 psi for old wells, 300 psi for new wells, or the authorized injection pressure, whichever is greater. The duration of the test of 30 minutes and the usual limit allowed for loss of pressure is 15 percent. Alternate mechanical integrity tets are allowed in lieu of the pressure test.

Other Storage/Disposal Practices

Spreading of salt water on roads under construction, as well as for maintenance, is allowed if written plan approval is received from the Kansas Department of Health and Environment.

Requests for a surface pond permit are statutorily granted unless denied by the Commission within 10 days. According to proposed Rule 82-3-600, the Commission, in approving applications for surface pond permits, must consider the protection of soil and water resources from pollution. Each operator of a surface pond must install observation trenches, holes, or observation wells if required by the Commission, and seal the pond with artifical material if the Commission determines that an unsealed condition will present a pollution threat to soil or water resources. Surface drainage must be prevented from entering the pond. During the past 2 years, it has become a practice, on a case-by-case basis, to require monitoring wells in association with surface ponds and emergency pits in areas of shallow ground-water supply.

There are approximately 25 permanent pits, receving a total of 30 barrels of produced water a day, mostly in the southeast corner of the State where there are no ground-water or seepage problems and where TDS concentrations of the produced waters are less than 10,000 ppm. Neither surface discharges of produced water nor pit disposal are allowed.

Upon the permanent cessation of the flow of fluids into any surface pond, all fluids resulting from oil and gas activities, plus rainwater (salt contaminated), must be removed to a disposal well approved by the Commission, or used for lease road maintenance or construction if approved by the Commission. Pond solids may be transported to a permitted solid waste landfill or to an approved offsite disposal area. Either action requires a permit from the Department of Health and Environment under the Kansas Solid Waste Statutes.

Offsite Disposal

Use is not made of offsite or commercial pits.

Plugging/Abandonment

Kansas Statute 55-156 states that prior to abandonment of any well that has been drilled, is being drilled, or may hereafter be drilled, the operator shall protect usable ground water or surface water from pollution, and from loss through downward drainage, by plugging the well in accordance with the rules and regulations adopted by the Commission. Failure to comply with these rules and regulations shall be a class E felony.

Within 90 days after operations cease on any well, the operator must plug the well or file an application of temporary abandonment. If no production has begun after a year, the operator must either reapply for temporary abandonment status or plug the well. Extensions are given for good cause, which means primarily for economic reasons or if the well is part of an engineered waterflood. Temporary abandonment approvals are issued by the Commission only after a field inspection and fluid level measurement have been conducted to determine that there is no evidence of casing holes. A mechanical integrity test or remedial action on the well may be required if the water level measurement indicates problems.

Cement plugs of at least 50 feet in length must be placed above each present or past productive formation, and both above and below any freshwater horizons. Intervals between all plugs must be filled with approved heavy mud-laden fluid.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

The State Corporation Commission of the State of Kansas. General rules and regulations, effective May 1, 1986.

USEPA. 1985. U.S. Environmental Protection Agency. Kansas Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communication:

Rick Hesterman, Kansas Corporation Commission (316) 263-3238.

STATE: Kentucky

AGENCIES: Department of Mines and Mining
Division of Oil and Gas
Department of Natural Resources and Environmental Protection (DNREP)
Division of Water (DOW)
Division of Waste Management (DWM)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DWM) - Landfarming of production fluids is prohibited.
Roadspreading - (DWM) - Roadspreading of production fluids is prohibited.
Pits - (DNREP) - Pits by rule (under 30 days) and permit (More than 30 days) for drilling and production pits. No liner requirements for drilling pits. Artificial liner required for production pits.
Surface water discharge - (DNREP) - Has NPDES primacy. None have been issued to date, but standards are in place.
Waste haulers - (DOW) - Produced water haulers have reporting requirements. No Manifest system.
Burial or landfill - (DWM) -
EOR/injection wells - Does not have UIC primacy. Primary method for disposal of produced fluids.

BONDING: Compliance bond required. Bond is conditioned upon the proper filing of records and well plugging. Bond amount is $1,000 per well or $5,000 blanket bond.

ENFORCEMENT: Administrative remedies available, including bond forfeiture. Attorney General assists in collection of bond forfeitures.

COMMENTS: No discussion of civil or criminal remedies available.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Kentucky

Forms completed by: D. Michael Wallen

Agency: Kentucky Division of Oil & Gas
Phone: (606) 254-0367

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: USEPA, Atlanta, GA
Kentucky Division of Oil & Gas

Off-site disposal: DNREP

(DNREP - Dept. of Natural Resources and Environmental Protection)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

On-Site Disposal: Class II injection wells must be permitted and bonded through both agencies. No cooperative agreement is in place.

Off-Site: Discharges meeting specific requirements may be permitted through the Kentucky Department of Natural Resources and Environmental Protection Division of Water.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   Division of Oil & Gas -- 11 field inspectors -- $350,000
   Division of Water -- 8 employees -- $290,000

2. Legal support;

   Division of Oil & Gas -- Attorney for the Dept. of Mines & Minerals
   Division of Water -- Not available

3. Permitting, siting, and administration; and

   Division of Oil & Gas -- 8 including the Director of the Division -- $200,000
   Division of Water -- 2 people -- $60,000

Please indicate, for each agency above, what type of training is needed for your staff.

Division of Oil & Gas Inspectors must have 5 years field experience or a related B.S. degree.

Division of Water -- Not available

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DWM	DWM
b.	Roadspreading	DWM	DWM
c.	Pits	DNREP	DNREP
d.	Surface water disposal	DNREP	DNREP
e.	Waste haulers	DOW	DOW
f.	Burial or landfill	DWM	DWM
g.	Disposal wells	Federal EPA	Federal EPA
h.	Enhanced oil recovery injection wells	Federal EPA	Federal EPA

(DWM - Division of Waste Management)
(DNREP - Dept. of Natural Resources and Environmental Protection)
(DOW - Division of Water)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	Federal EPA	EPA
b.	Clean Water Act (NPDES)	DOW	DOW
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DWM	DWM
	Subpart D (Non-Hazardous)		

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Division of Oil & Gas: Bonding
$1000 per well for individual well bonds
$5000 for blanket bonds

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Division of Oil & Gas: Attorney General assists in collection of Bond Forfeiture.

No Memorandums of Understanding

Please list the types of enforcement actions available?

Bond Forfeiture -- Division of Oil & Gas
Not available -- Division of Water

KENTUCKY

INTRODUCTION

Kentucky produced 5,347,384 barrels of oil and 72.4 x 10^9 cubic feet of gas from 10,713 gas wells, 21,026 oil wells, and 400 combination wells in 1989.

REGULATORY AGENCIES

The five agencies that regulate oil and gas activity in Kentucky are:

* Kentucky Division of Oil and Gas;
* Kentucky Department of Natural Resources and Environmental Protection;
* U.S. Bureau of Land Management;
* U.S. Army Corps of Engineers; and
* U.S. Environmental Protection Agency, Region IV.

The Kentucky Division of Oil and Gas, in the Department of Mines and Mining, issues drill permits and provides well casing and well plugging requirements. The State is seeking but does not yet have primacy for the UIC Class II well program.

The Kentucky Department of Natural Resources and Environmental Protection has NPDES-delegated authority. The Department issues permits for holding pits containing production fluids and instructions, pursuant to regulations, for pit construction.

The U.S. Army Corps of Engineers becomes involved in oil and gas activities on lands maintained for water management projects.

STATE RULES AND REGULATIONS

Drilling

Pursuant to Kentucky Regulation 401 KAR 5:090, there can be no discharge from a pit without an NPDES permit. Pits used to contain drilling muds or fluids associated with drilling activities have a permit by rule (under Title 401, Chapter 47 - Solid Waste Facilities) for construction and operation, provided that the pit life is no longer than 30 days after completion of exploration or drilling activities. Where the pit life is longer than 30 days beyond completion of exploration or drilling activities, the pit is defined as a holding pit and a facility-specific permit is required. When a pit is no longer in service, it must be backfilled and the land restored. There are no liner requirements for a drilling pit.

Production

A holding pit is a pit "designed to receive and store produced water at a facility." A holding pit must have a permit and must be lined with a synthetic material of 20 mil minimum thickness. The State may grant an exemption to the lining clause for pits that pre-existed the date of regulatory enactment. Construction requirements include at least 1 foot of freeboard and a 2-foot berm aboveground around the pit. Surface waters must be diverted from the pit.

No NPDES permits have been issued for discharges from holding pits. However, the Department of Natural Resources and Environmental Protection recently was sued and entered into a consent decree that specified a water quality criterion of 600 mg/L chloride as a 30-day average, with a maximum concentration not to exceed 1,200 mg/L at any time, as appropriate for receiving water quality. It is anticipated that there will be a number of requests for NPDES permits to discharge produced fluids.

Some holding pits are used as produced water storage pits until a contract hauler transports the fluids for well injection or other purposes. There is no manifest system per se, but the producer, the amount of fluid, and its destination following transportation must be reported. Most of the fluid goes into injection wells.

There is no roadspreading or landspreading of produced fluids in Kentucky. Some use currently is being made of mechanical evaporation.

Plugging/Abandonment

A well may be temporarily abandoned for cause for 2 years on a renewable basis. The well must be capped in such a way as to prevent the escape of oil, gas, or water from the well, or the entrance of foreign materials into the well.

Wells not drilled through coal-bearing strata may be plugged as follows:

(1) The Bottom of the hole shall be filled to the top of each producing formation, or a bridge shall be placed at the top of each producing formation, and in either event a cement plug not less than fifteen (15) feet in length shall be placed immediately above each producing formation whenever possible.

(2) A cement plug not less than fifteen (15) feet in length shall be placed immediately below all fresh water bearing strata.

(3) A plug shall be placed at the surface of the ground in each hole plugged in such a manner as not to interfere with soil cultivation.

(4) An uncased rotary hole drilled with the aid of liquid shall be plugged with approved heavy mud up to the base of the surface string at which point a plug of not less than fifteen (15) feet of cement shall be placed. The hole shall also be capped similar to other abandoned holes.

(5) Any well in which casing has been cemented from surface to total depth and no casin gcan be pulled may be plugged as follows: the bottom of the hole shall be filled to the top of the producing formation and a cement plug not less than fifteen (15) feet in length shall be placed above this fill. A surface plug shall be placed as provided insubsection (3) of this section. No intermediate plugs will be required.

(6) The operator shall have the option as to the method of placing cement in the hole by (i) dump bailer, (ii) pumping through tubing, (iii) pump and plug, or (iv) other method approved by the Director.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

Personal Communication:

Brian C. Gelpin, Kentucky Division of Oil and Gas (606) 254-3812.

Brad Lambert, Kentucky Department of Natural Resources and Environmental Protection (502) 264-3410.

STATE: Louisiana

AGENCIES: Department of Natural Resources (DNR)
Office of Conservation (OC)
Department of Environmental Quality (DEQ)
Public Service Commission (PSC)

MOU: Under development

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (OC) - Allowed by rule.
Roadspreading - Not allowed.
Pits - (OC) - Detailed operational/backfilling requirements for reserve pits. Liner not required for reserve pits, but liners required for production pits in most areas. Pits at gas plants and compressor stations exempt from liner requirements.
Surface water discharge - (DEQ) - Permitted with restrictions.
Waste haulers - (PSC) -
Burial or landfill - (OC-DEQ) -
EOR/injection wells - (OC) - Annular disposal of drilling and workover wastes allowed. Over 2/3 produced water injected.

BONDING: Compliance bond may be required. Bond is conditioned on proper plugging and abandonment. Bond amount for single well or blanket bond is determined by the Commissioner.

ENFORCEMENT: Available actions include compliance letters, compliance orders, civil penalty assessments, suspension or revocation of permits, and pipeline severance.

COMMENTS: Permit commercial disposal sites. Record keeping/manifest system for commercial disposal.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Louisiana

Forms completed by: Carroll D. Wascom

Agency: Louisiana Dept. of Natural Resources (DNR), Office of Conservation (OC)
Phone: (504) 342-5515

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DNR-OC

Off-site disposal: DNR-OC
DEQ

(DNR-OC - Dept. of Natural Resources, Office of Conservation)
(DEQ - Dept. of Environmental Quality)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The Louisiana Office of Conservation has regulatory authority for oil and gas waste. However, DEQ regulates the NPDES program in Louisiana. Steps are being taken to formulate a memorandum of understanding between OC and DEQ to address overlapping jurisdiction.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

Yes

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   34 inspectors: $770,174 (salaries), $154,375 (travel)

2. Legal support;

   1 contract attorney: $25,000 (approx.)

3. Permitting, siting, and administration; and

   7 administrative: $62,000 (approx.)

Please indicate, for each agency above, what type of training is needed for your staff.

DNR-OC

Inspectors - must have oil and gas industry experience
Administrative - Degree in Geology or Petroleum Engineering

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
_X_yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DNR-OC	DNR-OC
b.	Roadspreading	not permitted	not permitted
c.	Pits	DNR-OC	DNR-OC
d.	Surface water disposal	DEQ	DEQ
e.	Waste haulers	LA Public Service Commission	LA Public Service Commission
f.	Burial or landfill	DNR-OC	DNR-OC
g.	Disposal wells	DNR-OC	DNR-OC
h.	Enhanced oil recovery injection wells	DNR-OC	DNR-OC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DNR-OC	DNR-OC
b.	Clean Water Act (NPDES)	DEQ	DEQ
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEQ	DEQ
	Subpart D (Non-Hazardous)	DEQ	DEQ

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Commercial oil and gas waste treatment and disposal facilities are required to provide sudden and accidental pollution insurance coverage and provide the necessary funding (letter of credit, etc.) for future closure of the site.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The Office of Conservation initiates enforcement actions through administrative proceedings. OC and DEQ are currently preparing a joint MOU concerning fluid (lease) inspections and overlapping jurisdictions.

Please list the types of enforcement actions available?

Compliance letters
Compliance orders
Civil penalty assessments
Suspension/Revocation of premits
Pipeline severance

LOUISIANA

INTRODUCTION

Louisiana produced 449,545,000 barrels of oil and 5,867 x 10^9 cubic feet of gas in 1984. Louisiana ranks third in U.S. oil production and second in U.S. gas production. Over half of Louisiana's 25,823 oil wells are strippers. More than two-thirds of the State's 14,436 gas wells are marginal (produce less than 60,000 cubic feet of gas per day). Eighty-five percent of all produced fluids is salt water.

State statutes have regulated drilling operations since 1940. On January 20, 1986, the Office of Conservation promulgated amended rules and regulations regarding "the storage, treatment, and disposal of non-hazardous oilfield waste."

REGULATORY AGENCIES

Four agencies regulate oil and gas activity in Louisiana. They are:

* Louisiana Department of Natural Resources, Office of Conservation;
* Louisiana Department of Environmental Quality;
* U.S. Bureau of Land Management; and
* U.S. Army Corps of Engineers.

The Louisiana Department of Natural Resources Office of Conservation regulates all subsurface and surface disposal of oil- and gas-associated wastes. These powers are delegated to the Office of Conservation under Title 30 of the Louisiana Revised Statutes of 1950. The Office of Conservation has been granted primacy for all classes of UIC wells.

The Office of Conservation does not coordinate with EPA on NPDES permits, but does coordinate with the Louisiana Department of Environmental Quality (DEQ), Office of Water Resources, on any problem discharges originating from oil and gas activities. The Office of Water Resources also permits discharges of produced waters and reserve pit fluids. The effluent standards incorporated in the permits represent DEQ-OWR policy; the proposed effluent regulations for oil and natural gas development have not yet been adopted. The regulatory basis for that policy is found in rather general rules (January 27, 1953) of the Stream Control Commission and a subsequent order (July 1, 1968) of the Commission.

The Bureau of Land Management has jurisdiction over lease arrangements and post-lease activity on Federal lands where the mineral rights are federally held. Surface rights in Federal forests and grasslands are retained by the U.S. Forest Service. These rules, regulations, and orders are discussed in a separate section on Federal agencies. (See Volume 1, Chapter VII.) The Bureau of Indian Affairs has some jurisdiction in limited areas of Louisiana.

STATE RULES AND REGULATIONS

Drilling

Pit Construction/Management

Reserve pits used in the drilling of oil and gas wells do not have to be lined. However, Louisiana Statewide Order No. 29-B contains stringent operational requirements for reserve pits, including segretation of the drilling wastes in reserve pits from produced water or waste oil; protection from surface waters by levees, walls, and drainage ditches; and maintenance of 2-foot freeboard.

Pit Closure/Discharge

Reserve pits must be emptied of fluids and closed within 6 months of completion of drilling or workover operations. Prior to closure and for all closure and onsite and offsite disposal techniques except subsurface injection of reserve pit fluids, wastes must be analyzed for pH, oil, and grease, as well as a number of metal and salinity parameters. (An exemption to the testing requirement is granted for reserve pit fluids from wells drilled to less than 5,000 feet using freshwater "native" mud with limited amounts of bentonite, barite, or caustic soda.) Disposal of drilling and workover waste fluids at pit closure may be accomplished through annular injection, injection down another newly-drilled well that will be plugged, onsite land treatment, solidification and burial onsite, mixing waste with native soil and burial onsite, wastewater discharge, or offsite disposal at permitted commercial facilities.

The Water Pollution Control Division of DEQ issues a standard permit to oilfield service companies to discharge wastewater from treated drilling site reserve pits and abandoned or inactive production pits in order to facilitate pit closure. This permit allows the discharge of fluids meeting the following maximum effluent limitations:

Oil and grease	15 mg/L
Total suspended solids	50 mg/L
Chemical oxygen demand	125 mg/L
Total chromium	0.5 mg/L
Zinc	5.0 mg/L
Chlorides	500 mg/L
pH	6.0 to 9.0

There are provisions for dilution of the wastewater to meet the chloride limitation, provided all other parameters are met (i.e., predilution chloride concentrations must be less than 2,000 mg/L in freshwater areas and less than four times ambient chlorinity in brackish and saline areas).

Reserve pit fluids may be disposed of onsite if applicable technical criteria are met. For land treatment, burial, or trenching, waste/soil mixture must not exceed:

pH	6-9
Arsenic	10 ppm
Barium	2,000 ppm
Cadmium	10 ppm
Chromium	500 ppm
Lead	500 ppm
Mercury	10 ppm
Selenium	10 ppm
Silver	200 ppm
Zinc	500 ppm

Onsite land treatment may be used to close pits containing only nonhazardous oil field wastes by mixing wastes with soil from pit walls or levees and adjacent areas, provided the resultant waste/soil mixture meets the above criteria, has an oil and great content of no greater than 1 percent (dry weight), and meets additional parameters in freshwater wetlands not normally inundated and in uplands:

Electrical conductivity (EC)	< 8 mmhos/cm (wetlands) < 4 mmhos/cm (uplands)
Sodium absorption ratio (SAR)	<14 (wetlands) <12 (uplands)
Exchangeable sodium % (ESP)	<25% (wetlands) <15% (uplands).

Pits may be closed by mixing the waste with soil and burying the mixture onsite if it meets the above pH and metals limits, has a moisture content <50 percent by weight, EC 12 mmhos/cm, and an oil and grease content 3 percent by weight. The top of the burial site must be at least 5 feet below ground level and covered by native soil; the bottom should be at least 5 feet above the seasonal high water table.

Pits may be closed by solidification and onsite burial, using the same cover and depth requirements, if they have a pH of 6 to 12 and do not exceed the following limits in leachate tests:

Oil and grease	10.0 mg/L	Lead	0.5 mg/L
Arsenic	0.5 mg/L	Mercury	0.02 mg/L
Barium	10.0 mg/L	Selenium	0.1 mg/L
Cadmium	0.1 mg/L	Silver	0.5 mg/L
Chromium	0.5 mg/L	Zinc	5.0 mg/L

The solidified material must also meet permeability, compressive strength, and wet/dry durability criteria.

Injection of drilling and workover waste fluids (including reserve pit fluids) may only be done at the well where used, and must not endanger underground sources of drinking water. Surface casing annular injection may be authorized if the surface casing is set and cemented at least 200 feet below the base of the lowest underground source of drinking water. Injection may be through perforations in the intermediate or production casing if that casing is set and cemented at a similar depth. Surface casing open-hole injection may be approved if, in addition to meeting the 200-foot requirement, there is a cement plug of at least 100 feet across the uppermost potential hydrocarbon zone.

Production

Pits

All production pits must be lined so that the hydraulic conductivity of the linear does not exceed 1×10^{-7} cm/sec. Liners may consist of clays, soil mixed with cement or clays, synthetics (at least 10 mil thickness), or any combination meeting the 1×10^{-7} cm/sec limitation. Production pits located within inland tidal waters, lakes bounded by the Gulf of Mexico, and saltwater marshes are exempted from the liner requirement provided they are part of an approved treatment train for removal of residual oil and grease. Natural gas processing pits and compressor station pits that collect and store process water and stormwater runoff are also exempted. Act 437 of the 1989 legislative session requires the Office of Conservation to promulgate regulations which will require the closure of all production pits located within the coastal areas of the state by January 1, 1993.

Surface Discharge

The current policy of the Office of Water Resources of DEQ is that discharge of produced water is permitted into brackish and saline areas, with a discharge limit for oil and grease of 72 mg/L (monthly sample). A report is required on monthly volumes discharged and on oil and grease, and an annual report is required on chlorinity (though no limit is established). The discharge must be to an open-flowing water body of sufficient volume to prevent stratification and significant buildup of ambient salinity. The actual regulatory requirement states that "saltwater may be disposed of in normally saline waters, tidally affected waters, brackish waters or other waters unsuitable for human consumption or agricultural purposes."

Exceptions to the restriction against discharges in freshwater bodies are given for the Mississippi River and its tributaries below Venice and the Atchafalaya River below Morgan City.

New regulations, issued in November 1985, for the first time required that all of the above discharges be permitted. A mailing, sent out in 1986, required the filing of information and permit applications for current discharges. When these applications are received and evaluated, discharges actually occurring in freshwater areas not covered by the above exceptions would be required to end.

Injection

Over two-thirds of the produced water is reinjected for enhanced recovery or disposal, both onsite and commercial. Injection wells must be equipped with tubing set on a mechanical packer, no higher than 150 feet above the top of the disposal zone. Surface casing must be set through the deepest underground source of drinking water and cemented back to the surface. Long string casing must be cemented above the injection zone.

Mechanical integrity tests must be carried out at least every 5 years. Test pressures should be at the maximum permitted injection pressure, but within the interval of 300 to 1,000 psi. The test interval should be 30 minutes, with no greater than a 5 psi variance.

Offsite Disposal

Reserve pit contents can be transported offsite to permitted commercial land treatment or pit disposal facilities. Produced water can be transported to commercial underground injection wells.

Louisiana requires a substantial degree of financial commitment from commercial facility operators. Applicants for permits for commercial facilities must provide evidence of sufficent financial capability to ensure both adequate coverage of any liability incurred and a guarantee of funding for proper closure of the facility. A bond or irrevocable letter of credit must be provided for closing, based on closing costs estimated in the facility plan. Insurance against any liabilities that may be incurred must be provided through certificates of insurance, letters of credit, or other accpetable financial instruments. Required minimums are $1 million for commercial facilities operating open pits; $500,000 for commercial facilities that store, treat, or dispose of nonhazardous oilfield waste solids; $250,000 for commercial facilities which operate injection/closed storage systems; and $100,000 for transfer stations operated in conjunction with permitted commercial facilities.

Commercial facilities may use lined pits for temporary storage, not permanent disposal, of nonhazardous oil field wastes. Such pits must be located on the site of the permitted treatment system, must not exceed 50,000 barrels capacity, and must have maximum hydraulic conductivity of 1×10^{-7} cm/sec.

Commercial land treatment facilities must be isolated from contact with water supplies, and are subject to extensive and continuous monitoring and sampling requirements. Limitations on concentrations and other parameters are established as maximums at any time in the treatment zone (a), at the time of closure in the treatment zone (b), and in surface runoff water from the facility (c):

	(a)	(b)	(c)
pH	6.5 - 9	6.5 - 9	6.5 - 9
Oil and grease	5%	3%	15 ppm
EC	10 mmhos/cm	10 mmhos/cm	0.75 mmhos/cm
SAR	12	12	10
ESP	15%	15%	
TSS			60 ppm
COD			125 ppm
Chloride			500 ppm
Arsenic	40 ppm	10 ppm	0.2 ppm
Barium	3,000 ppm	3,000 ppm	undetermined
Cadmium	10 ppm	10 ppm	0.05 ppm
Chromium	1,000 ppm	1,000 ppm	0.15 ppm
Lead	1,000 ppm	1,000 ppm	0.1 ppm
Mercury	10 ppm	10 ppm	0.01 ppm
Selenium	10 ppm	10 ppm	0.05 ppm
Silver	200 ppm	200 ppm	
Zinc	500 ppm	500 ppm	1 ppm

Commercial facilities may also receive permits to produce reusable materials from nonhazardous oil field waste. Such materials may be used as daily cover in sanitary landfills or as construction fill (subject to case-by-case review by the Commissioner). The oil and grease and metals leachate test limits are identical to those for leachate tests for solidification (above); the ESP, SAR, and pH limits are the same as those for treatment zones at commercial land treatment facilities; and EC is 8 mmhos/cm.

A complete manifest system to track the transportation and disposal of wastes taken to offsite commercial facilities is enforced.

Plugging/Abandonment

Wells must be plugged within 90 days of notice in the "Inactive Well Report" unless the operator submits a plan describing the well's future use; the well is then classified as having future utility.

When plugging, a cement plug of 100 feet must be placed above or across the uppermost perforated interval. Where production casing was not runor was removed, a cement plug must run from 50 feet below to 50 feet above the shoe of the surface casing. If freshwater strata are not protected by the casing, a cement plug must extend from 100 feet below to 150 feet above the deepest freshwater stratum, and a plug should be placed from 50 feet below to 50 feet above the shoe of the surface casing. A 30-foot plug must be placed at the top of the well. Additional plugs must be placed to contain high pressure oil, gas, or water sands. In wells completed with screen or perforated liners that cannot be practically removed, a 100-foot cement plug must be placed with its bottom as near as possible to the top of the liner or screen. Mud-laden fluids must fill those portions of the well not filled with cement.

References

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

Louisiana State Statutes 1950 30:204.

State of Louisiana, Department of Natural Resources, Office of Conservation. Amendement to Statewide Order No. 29-B, January 20, 1986.

Wascom, Carroll, D. Oilfield pit regulations - A first for the Louisiana oil and gas industry, May 30, 1986.

Personal Communication:

Lynn Wellman, Water Pollution Control Division, Office of Water Resources, Department of Environmental Quality (504) 342-6363.

STATE: Maryland

AGENCIES: Maryland Department of the Environment (MDE)
Maryland Department of Natural Resources - Geological Survey (DNR, MGS)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Not permitted (MDE)
Roadspreading - Not permitted (MDE)
Pits - Pits must be either lined or have a discharge permit. (MDE)
Surface water discharge - NPDES primacy state, but no permits have been issued for oil and gas wastes. (MDE)
Waste haulers - Wastes usually transported to a permitted water disposal facility or to a sewage treatment plant, or transported out of state for disposal. No manifest system unless waste is defined as hazardous.
Burial or landfill - Not permitted (MDE)
EOR/injection wells - UIC primacy state, but no Class II wells have been permitted. (MDE)

BONDING: Compliance bond required. Bond is conditioned upon proper drilling, plugging and abandonment of wells. Bond amount is $10,000 per well or $50,000 for a blanket bond. Proposed regulations raise this amount to $25,000 per well and $125,000 for a blanket bond.

ENFORCEMENT: Maryland's only facility is inspected periodically. Violations of State Discharge Permit are subject to enforcement.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Maryland

Forms completed by: John Veil

Agency: Maryland Department of the Environment (MDE)
Hazardous and Solid Waste Management Administration (HSWMA)
Phone: (301) 631-3314

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: MDE - HSWMA

Off-site disposal: MDE - HSWMA

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

n/a

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

We currently have only one facility in the state which is disposing wastes from gas production. The necessary support takes only a small fraction of a man-year and is absorbed in the regular budgets for these activities.

1. Enforcement, field monitoring and inspection;

2. Legal support;

3. Permitting, siting, and administration; and

Please indicate, for each agency above, what type of training is needed for your staff.

If we get involved more heavily with drilling wastes, we will need training in all phases as there is not that expertise here now.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

	Disposal on-site	Disposal off-site
a. Landfarming	MDE-HSWMA	MDE-HSWMA
b. Roadspreading	MDE-HSWMA	MDE-HSWMA
c. Pits	MDE-HSWMA	MDE-HSWMA
d. Surface water disposal	MDE-HSWMA	MDE-HSWMA
e. Waste haulers	MDE-HSWMA	MDE-HSWMA
f. Burial or landfill	MDE-HSWMA	MDE-HSWMA
g. Disposal wells	MDE-HSWMA	MDE-HSWMA
h. Enhanced oil recovery injection wells	MDE-HSWMA	MDE-HSWMA

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

	Disposal on-site	Disposal off-site
a. Safe Drinking Water Act (UIC)	MDE-HSWMA	MDE-HSWMA
b. Clean Water Act (NPDES)	MDE-HSWMA	MDE-HSWMA
c. Resource Conservation & Recovery Act (RCRA)		
Subpart C (Hazardous)	MDE-HSWMA	MDE-HSWMA
Subpart D (Non-Hazardous)	MDE-HSWMA	MDE-HSWMA

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Bonding is required for drilling, plugging, and abandoning the wells.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The agency initiates enforcement action which can be civil or criminal in nature. No MOU governs this practice.

Please list the types of enforcement actions available?

Site complaint, notice of violation

MARYLAND

INTRODUCTION

In 1989, Maryland produced 34 million cubic feet of gas from eight gas wells and no oil.

REGULATORY AGENCIES

The two agencies regulating oil and gas activities in Maryland are:

* Department of Natural Resources, Geological Survey (DNR, MGS); and
* Department of the Environment (MDE).

The Department of Natural Resources regulates gas storage. It issues drilling permits and regulates site erosion in conjunction with the MDE.

The Department of the Environment regulates the disposal of wastes and wastewaters. Section 6-104 of the Natural Resources Article, Annotated Code of Maryland, provides that a person may not dispose of any product of a gas or oil well without a permit issued by the MDE. In addition, Section 9-322 of the Environment Article, Annotated Code of Maryland, specifies that a person may not discharge any pollutant into waters of this State except through a discharge permit. MDE has both NPDES delegation and UIC program authority.

STATE RULES AND REGULATIONS

Drilling and Production

Drilling and production wastes are managed by MDE. There is no differentiation between pits that are associated with drilling or production activities.

A pit may be lined with an impervious material such as clay or a plastic to prevent groundwater pollution. Fluids introduced to lined pits are generally transported to a permitted water disposal facility or to a sewage treatment plant, or they may be transported out of state for disposal purposes. The impervious material must have a permeability of 10^{-7} cm/sec or less. There is no manifest system associated with transporting gas wastes unless such wastes are defined as hazardous.

Pits that are not lined must have a State Discharge Permit. The requirements associated with pit contents that would meet permit conditions for groundwater discharge are determined on a site-by-site basis. In addition, if there is a discharge to surface waters from a pit, an NPDES permit would be required.

Maryland's only oil and gas waste disposal facility is a gas storage extraction facility in the western part of the state. This facility is permitted to discharge about one million gallons per year of extraction waters through infiltration ponds. The permit requires that the first of a series of ten ponds be lined. There are periodic monitoring requirements for the ponds and a nearby stream and a monitoring limit for methanol. Methanol is used to prevent freezing during product extraction. There are no monitoring wells onsite.

Offsite Disposal

The only offiste disposal pit used in the state is the one in western Maryland described above. Some transporting production fluids are received by this facility.

Plugging/Abandonment

There are no specific requirements in the regulations relating to the time within which a well must be plugged.

When plugging, the well must be filled with mud, clay, or other nonporous material from the bottom (or from a bridge 30 feet below the lowest stratum) to 20 feet above the lowest oil, gas, or water-bearing stratum, at which point a cement plug should be placed. Similar filling and cementing steps should be taken for each oil, gas, or water stratum. A plug should be anchored about 10 feet below the bottom of the largest casing in the well, and the remainder of the well should be filled with nonporous material to within two feet of the surface.

References

Interstate Oil and Gas Commission. Summary of State Statutes and Regulations for Oil and Gas Production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Personal Communications:

John Veil, Department of the Environment, Hazardous and Solid Waste Management Administration (301) 631-3314.

Ken Schwarz, Department of Natural Resources, Maryland Geological Survey (301) 554-5525.

STATE: Michigan

AGENCIES: * Department of Natural Resources (DNR)
Geological Survey Division (GSD)

MOU: No.

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DNR) -

Roadspreading - (DNR) - Prohibit roadspreading of reserve pit fluids. Allow roadspreading of produced water.

Pits - (DNR) - Liners generally required for mud pits.

Surface water discharge - (DNR) - Delegated NPDES program.

Waste haulers - (DNR) -

Burial or landfill - (DNR) - Burial or solidification of reserve pit solids. Solid waste disposal sites are licensed. Off-site landfills are permitted.

EOR/injection wells - (DNR) - Allow annular injection of reserve pit fluids. About 90% of produced water is injected. Annular injection of reserve pit wastes allowed.

BONDING: Compliance bond required. Bond is conditioned upon proper plugging and abandonment. Bond amount is $5,000 per well or $50,000 blanket bond.

ENFORCEMENT: Actions available include shut-down of drilling or production, denial of drilling permits, denial of ownership transfers, and fines up to $3,000.

COMMENTS: Record keeping requirements?

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Michigan

Forms completed by: R.H. Ellison

Agency: Michigan Department of Natural Resources (DNR), Geological Survey Division (GSD)
Phone: (517) 334-6945

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DNR/GSD

Off-site disposal: DNR/GSD
WMD

(DNR/GSD - Dept. of Natural Resources, Geological Survey Division)
(WMD - Waste Management Division)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

U.S. EPA - Injection wells only--Dual Permitting

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

Yes

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

This is for Oil & Gas Regulation by Geological Survey Division only.

1. Enforcement, field monitoring and inspection;

   47 FTE - $2,000,000 Est.

2. Legal support; and

   1 Assistant Attorney General--Part Time Est. $50,000

3. Permitting, siting, and administration.

   8 FTE - $375,000 Est.

Please indicate, for each agency above, what type of training is needed for your staff.

Technical Staff--Geologists and Petroleum Technicians

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
_X_ yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DNR	DNR
b.	Roadspreading	DNR	DNR
c.	Pits	DNR	DNR
d.	Surface water disposal	DNR	DNR
e.	Waste haulers	DNR	DNR
f.	Burial or landfill	DNR	DNR
g.	Disposal wells	DNR	DNR
h.	Enhanced oil recovery injection wells	DNR	DNR

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	No State Primacy	No State Primacy
b.	Clean Water Act (NPDES)	DNR	DNR
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DNR	DNR
	Subpart D (Non-Hazardous)	DNR	DNR

3. List any financial assurance requirements for oil and gas exploration and production wastes:

$5,000 Single Well Bond or $50,000 Blanket Bond

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Agency Enforcement through administrative proceedings

Please list the types of enforcement actions available?

Shut down drilling, shut down production
Stop issuing permits to drill, stop well ownership
Transfers, up to $3,000 fines

MICHIGAN

INTRODUCTION

Michigan produced 29,140,000 barrels of oil and 152,840 MMCF of gas in 1985 from 1,380 flowing wells an 4,480 pumping wells. In 1984, the State ranked 12th in U.S. oil production and 18th in U.S. gas production. Oil and gas production in Michigan peaked in 1980 and has been on a slight decline for the past 5 years.

The first successful Michigan oil well was drilled in 1886. The first oil and gas drilling permit was issued in 1927.

REGULATORY AGENCIES

The five agencies that regulate oil and gas activities in Michigan are:

* Michigan Department of Natural Resources;
* Michigan Department of Commerce, Public Service Commission;
* U.S. Forest Service;
* U.S. Bureau of Land Management; and
* U.S. Environmental Protection Agency.

The Michigan Oil and Gas Act of 1939 (PA 61) established the position of Supervisor of Wells and designated the Director of the Department of Natural Resources to that office. The Director, as authorized, appointed the Chief of the Geological Survey Division as the Assistant Supervisor of Wells to act on his behalf. The prime regulator of the oil and gas industry is the Assistant Supervisor of Wells and herein will be referred to as the Supervisor. The Supervisor has authority to subpoena, to establish well spacing requirements, to develop orders without legislative interference, and to control the disposal of solid and liquid wastes from drilling. The Oil and Gas Act provides the Supervisor with broad authority to regulate the industry from "cradle to grave"; it stresses "prevention of wastes" from exploration to well abandonment. The State requires a bond, an environmental assessment, and spacing minimums, and approves all well construction design.

The Water Resources Commission Act of 1929 (PA 245) regulates discharges to and the pollution of any waters of the State; NPDES permits are issued under Act 245. Michigan is an NPDES-delegated State, with such permits issued by the Surface Water Quality Division of the Environmental Protection Program Area in the Department of Natural Resources. No NPDES permits are issued for oil and gas wastes.

The Solid Waste Management Act of 1978 (PA 641) provides for the licensing of solid waste disposal sites.

The State of Michigan does not require NPDES or landfill permits for disposal of liquid or solid oil field drilling wastes; these activities are regulated by the Supervisor of Wells. Law enforcement conservation officers of the Department of Natural Resources provide liaison with the Attorney General and the county prosecutors in dealing with local court actions. Where a ground-water problems has been identified through investigation and monitoring by the Geological Survey Division, and ground-water restoration is required, the Surface Water Quality Division issues an NPDES permit for discharging the restored water.

The Air Quality Division of the Department of Natural Resources regulates gaseous emissions to the atmosphere, while the Michigan Public Service Commission regulates the production of gas from dry natural gas reservoirs and the safety of gas pipeline construction.

When drilling occurs on Federal lands, Federal review of the drilling applications depends on whether Federal ownership is restricted to surface rights or includes both surface and mineral rights. When only surface rights are owned by the Federal Government, a copy of the drilling application is sent to the Federal agency involved, generally the U.S. Forest Service. Two separate investigations follow: one by the Geological Survey and one by the U.S. Forest Service, which involves fish and wildlife, geological, and other Federal experts. A Federal surface use permit then is issued. The drilling application is not approved by the State until all reviews have been completed and pertinent comments have been made a part of permit conditions. When both surface and mineral rights are Federally owned, a copy of the drilling application is sent to both the U.S. Forest Service and the Bureau of Land Management.

The U.S. Environmental Protection Agency administers the UIC program for the State (40 CFR 147.1151).

STATE RULES AND REGULATIONS

Drilling

There are several pit construction/site management requirements. According to Instruction 1-84 (effective February 1, 1985) of the Supervisor of Wells, liners are required for mud pits when drilling with saltwater-based drilling fluids or when drilling through salt formations or brine-containing formations. While case-by-case exceptions to the requirement for lined drilling pits may, in principle, be approved when a well to be drilled will encounter only fresh water (as in the southern part of the peninsula), such an exception is rarely requested.

Liners for mud pits must be made of an impervious material that will meet or exceed the specifications for 20 mil virgin PVC. Liners of other than 20 mil virgin PVC must be approved by the Supervisor. Liners must be installed in a manner that would prevent vertical and lateral leakage, and must be either one piece of have factory-installed seams. Mud pits cannot be built where the ground-water table is observed at the depth of the proposed excavation. In such cases, steel tanks are used and the drilling muds are disposed of at an approved offsite location.

Instruction 1-84 restricts the use of mud pits to "drilling muds, drilling fluids, cuttings, native soils, cementing materials and/or approved pit stiffening materials." No salt cuttings from drilling may be released to the pit as solids; they must be screened out and dissolved before being released (via a closed system) to the pit.

Instruction 1-84 also requires that cellars be sealed and rat and mouse holes be equipped with a closed end steel liner or otherwise sealed or cased so that all fluids entering the cellar, rat hole, and/or mouse hole would not be released to the ground, but would instead be discharged to steel tanks, the lined reserve pit, or the mud circulation system. Aprons of 20 mil virgin PVC or other equivalent material should be installed under steel mud tanks and overlapping the mud pit apron, and in ditches or under pipes used for produced water conveyance from cellars to pits or to steel mud tanks.

Pit Closure

At closure, all free liquids above the solids in the mud pits must be removed to the maximum extent possible and either reused or disposed of. The remaining mud pit solids may be required to be stiffened (mixed with cement earthen or other approved materials). In any event, the residue is encapsulated and buried onsite or removed to an approved waste disposal site. For onsite disposal, the edges of the pit liner must be folded over the pit, and a separate piece of 10 mil virgin PVC should be used to entirely encapsulate the pit. The top of the cover must be buried at least 4 feet below grade. The Supervisor may require additional measures under special circumstances.

For abandoned pits, or pits used prior to Special Order 1-81 issued in 1981 and not meeting its specifications, no action is taken unless a contamination problem has been detected. When a potential contamination problem exists, the site is investigated by the Survey's ground-water unit. If it can be shown that an identifiable entity is responsible, damages may be sought administratively or through the courts.

Disposal

Free liquids from the mud pits must be pumped off prior to encapsulation, either for disposal or for use in the drilling of additional wells. Fluids may be disposed of in Class II injection wells.

Two additional options are specified in Special Order 1-85. The Supervisor may authorize the disposal of fluids onsite to dry holes as part of plugging operations usually injected below a cement retainer. One time authorization may be granted by the supervisor where production casing is run to inject drilling fluids into the annular space. In both cases, drilling fluids must be injected in permeable formations isolated below freshwater horizons.

Prior to Special Order 1-85, pit fluids were allowed to be spread on roads for dust and ice control. A 1983 estimate shown that 22 million of the 28 million gallons of pit fluids generated during the year were spread on roads. Special Order 1-85 prohibited the use of pit brines for ice control on March 29, 1985, and prohibited their use for dust control as of September 1, 1985.

Offsite disposal in approved lined landfills with leachate collection systems is also permitted.

Produced Fluids

Injection

Over 90 percent of Michigan's produced waters are now disposed of by injection into Class II wells. Such wells must have a surface string of casing that is cemented and completely isolates the freshwater aquifers from the downhole disposal zone.

The wells must be "cased and sealed to prevent the loss or injection of brine into any unapproved formation." Wells must be equipped with tubing and packer. Since Michigan does not have delegated UIC authority, EPA's Region V directly implements the mechanical integrity test program. Wells are required to meet a standard pressure test of 300 psi for 30 minutes, with 3 percent allowable bleed-off.

Annular disposal is prohibited except as may be granted by the supervisor as authorized by supervisor's Order 1-85.

Surface Disposal

Produced waters were formerly used for both ice and dust control in Michigan. Special Order 1-85, issued on March 29, 1985, immediately banned the use of produced water for ice control. The use of produced waters for dust control may continue through September 12, 1987 (provided the produced waters meet specifications for benzene, toluene, and xylene content). Annual 1-year extensions may be granted allowing continued use of brine for dust control. Such 1-year extensions may continue until a 3-year DNR environmental impact study has been completed. The decision as to whether to allow continued road application of produced waters will be based on the results of this study.

Offsite Disposal

Solid drilling wastes may be disposed of in an approved, licensed solid waste landfill, with the agreement of the landfill operator, where the landfill is lined and has a leachate collection system, a ground-water monitoring system, and a treatment process prior to the discharge of waste leachate.

Road disposal of produced waters remains temporarily available for dust control, producers may provide produced waters to a hauler if the hauler can verify in writing the authorization to receive produced waters on behalf of a governmental unit.

Plugging/Abandonment

Plugging operations must begin within 60 days after completion as a dry hole or within a year after cessation of production. Extensions may be granted by the Supervisor if there are sufficient reasons for retaining the well.

Oil, gas, produced water, and fresh water should be confined to the strata in which they occur by use of muds, cement, or other suitable materials; both the materials and methods of placement must be specified and approved by the Supervisor. The surface pipe is abandoned with the hole and must be cut off below plow depth and sealed with a cement plug or other approved material.

References

Crabtree, Allen F. 1985. Drilling mud and brine waste disposal in Michigan. Paper presented at the Reclamation Review Technical Advisory Committee Seminar/Workshop on Gel and Salined Based Drilling Wastes, Edmonton, Alberta, Canada, April 24, 1985.

Debrabander, S. 1985. Letter communication to EPA. Geological Survey Division, Michigan Department of Natural Resources.

Interstate Oil and Gas Commission. 1986. Summary of State Statutes and Regulations for Oil and Gas Production June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Order of the Supervisor of Wells, Special Order 1-85, dated March 29, 1985.

Supervisor of Mineral Wells Instruction 1-84. Use of Liners in Earthen Drilling Pits, Sealing of Cellars, Rat Holes, Mouse Holes and Other Procedures to Protect Ground Waters, effective February 1, 1985.

USEPA. 1985. U.S. Environmental Protection Agency. Michigan Meeting Report. Proceedings of the Onshore Oil and Gas Workshop (March 26-27 in Atlanta, Ga.) Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

Steve Debrabander, DNR Geological Survey Division (517) 334-6976.

Bill Shaw, DNR Office of Water Quality (517) 373-8088.

Rex Tefertiller, Permit, Geological Survey Division (517) 334-6974.

STATE: Mississippi

AGENCIES: * State Oil and Gas Board (OGB) - on-site
Department of Environmental Quality (DEQ) - off-site

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DEQ) -
Roadspreading -
Pits - (OGB-DEQ) - Reserve pits permitted as part of drilling permit. Standards in place for reserve pit waste disposal. Rules authorize temporary lined salt water pits, emergency pits, burn pits, and well test pits. No testing required before pit closure. Only 2 commercial pits.
Surface water discharge - (DEQ) - Not allowed.
Waste haulers - (OGB) -
Burial or landfill - (DEQ) -
EOR/injection wells - (OGB) -

BONDING: No compliance bond required.

ENFORCEMENT: Options include administrative notifications and orders, pipeline and transport severance, and public hearings with penalties. Criminal and civil actions are initiated through the Attorney General.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Mississippi

Forms completed by: Jeff Lundy

Agency: Mississippi State
Oil and Gas Board (OGB)
Phone: (601) 354-7127

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: OGB
DEQ

Off-site disposal: DEQ

(OGB - State Oil & Gas Board)
(DEQ - Dept. of Environmental Quality)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The State Oil and Gas Board regulates injection of oil and gas wastes and, through a memorandum of agreement, regulates on-site landfarming of mud pit solids.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

State Oil and Gas Board

1. Enforcement, field monitoring and inspection;

   11 persons (8 devote 50% of their available man-hours)
   $200,000

2. Legal support;

   1 part-time attorney and 1 paralegal (part-time)

3. Permitting, siting, and administration; and

   4 persons
   $224,495

Please indicate, for each agency above, what type of training is needed for your staff.

Inspectors are trained on-the-job.
Geologists and engineers are degreed through major colleges and have oil field experience.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DEQ	DEQ
b.	Roadspreading	n/a	n/a
c.	Pits	OGB	DEQ
d.	Surface water disposal	n/a	n/a
e.	Waste haulers	OGB	OGB
f.	Burial or landfill	DEQ	DEQ
g.	Disposal wells	OGB	OGB
h.	Enhanced oil recovery injection wells	OGB	OGB

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OGB	OGB
b.	Clean Water Act (NPDES)	DEQ	DEQ
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEQ	DEQ
	Subpart D (Non-Hazardous)	DEQ	DEQ

3. List any financial assurance requirements for oil and gas exploration and production wastes:

All Class II wells must have a bond or letter of credit in favor of the State Oil & Gas Board sufficient to cover the costs of plugging and abandoning the well as set forth in the approved plugging/abandonment plan. A ratio test as set forth in the CFR may be substituted along with an annual audited stockholder's report.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The State Oil and Gas Board initiates enforcement actions through administration notification, pipeline and transport authority severance, public hearings with penalties, and civil and criminal actions through the attorney general's office.

The Department of Environmental Quality issues Administrative orders after open hearings and can initiate suits through the attorney general's representative.

Please list the types of enforcement actions available?

See above.

MISSISSIPPI

INTRODUCTION

Mississippi produced 28,462,215 barrels of oil in 1989 from 4,517 oil wells; 202 x 10^9 cubic feet of gas were produced.

REGULATORY AGENCIES

Three agencies regulate the oil and gas activity in Mississippi:

* State Oil and Gas Board;
* Mississippi Department of Environmental Quality (DEQ), Bureau of Pollution Control; and
* Department of Wildlife Conservation.

The State Oil and Gas Board regulates the oil and gas industry "to prevent the pollution of freshwater supplies of oil, gas, or saltwater" and to promote, encourage, and foster the oil and gas industry (Section 53-1-17, State Statutes). The Oil and Gas Board does have UIC program authority.

The Department of Environmental Quality, Bureau of Pollution Control, is responsible for the investigation of water pollution and for the issuance of NPDES permits. No NPDES permits are issued for drilling fluids, completion fluids, workover fluids, or produced waters generated by the onshore oil and gas industry.

The Department of Wildlife Conservation is responsible for the maintenance of fish and wildlife within the State.

A 1982 Memorandum of Agreement among the Department of Environmental Quality, Department of Wildlife Conservation, and the State Oil and Gas Board coordinates the activities of the three State agencies related to the oil and gas industry. The Agreement ensures that the Mississippi Commission on Wildlife Conservation has an opportunity to review the drill plan, as drilling may impact the sensitive environmental nature of the State's wetland resources. The Agreement further allows for suspension of a lessee's operations by the Oil and Gas Board where any signatory agency determines such operations to be in violation of applicable laws or regulations.

STATE RULES AND REGULATIONS

Drilling

The use of drilling reserve pits or mud pits does not require a special permit; the permit to drill constitutes the permit for the drilling reserve pit. Reserve pits must be constructed to prevent pollution of surface of subsurface fresh waters. A generalized diagram depicting pit construction must be submitted with a drilling permit and the permit is contingent upon approval of the pit plan.

The reserve pit must be emptied of fluids, backfilled, and compacted within 3 months of the completion of drilling operations. Exceptions may be granted if warranted, and the reserve pits may be used as test pits, with the agreement of the Board's field representative, if they meet the conditions for well test pits.

When closing the reserve pit, threre are several options for disposing of the drilling muds. Where the well is a dry hole, the fluids may be pumped back into the hole before plugging and abandonment, provided the surface casing has been set to a point below the base of the USDW. They may be landfarmed if they will "not... cause contamination of soils." The muds may be hauled to a commercial disposal facility designed to handle drilling muds. The muds may also be treated in the pit with flocculants to aid in precipitation, coagulation, and sedimentation. The supernatant water is then sampled in place to determine that it does not exceed the following limits established by the Department of Environmental Quality in its "Reserve Pit Discharge Policy":

Chlorides	500 mg/L
pH	6 - 9
Suspended solids	100 mg/L
Specific conductance	1,000 mmhos/cm
COD	250 mg/L
Zinc	5 mg/L
Chromium	0.5 mg/L
Phenol	0.1 mg/L

If the fluids meet this limit, they can be discharged. These discharges are considered to be part of the policy covered by the drilling permit and do not require a separate discharge permit. The Oil and Gas Board has incorporated these limits formally into their pit regulation (in Rule 45, Section E7). After the discharge, the dewatered muds are covered in place and the pit is closed as noted above.

Production

Pits

The regulations of the State Oil and Gas Board contain a provision requiring that earthen pits "be phased out and discontinued, except as hereinafter provided." The regulations further specify limited conditions under which specific types of pits may be used, and the requirements that must be met in their construction and management. When permits are issued for pits (other than reserve pits), the longest permit period is 2 years. In addition to reserve pits, permits are issued for four types of pits:

(1) Temporary saltwater storage pits: The Board's regulations stipulate that this type of pit will be "permitting only if no other means of storing or disposing of salt water is available" (e.g., in remote areas). When permitted, these pits must be lined with openings in the walls or dikes, and must be protected from surface waters by dikes and drainage ditches. Only produced waters should be placed in the pit (after separation), and fluid levels should never rise to within 1 foot of the top.

(2) Emergency pits: Produced water should never intentionally be placed in such pits, but only in the event of an emergency such as a saltwater disposal or water injection system failure. A field representative of the Board must be notified within 72 hours. Within 2 weeks after the emergency period, the pit must be emptied so as to contain no more than 2 feet of water. The fluid level must never rise to within 1 foot of the top of the pit; there must be no siphons or openings in the walls of the pit; and dikes and drainage ditches should be used to protect the pit from surface water.

(3) Burn pits: These pits may be used to burn tank bottoms and other refuse products only if approved. The burn pits must be placed at least 100 feet away from the facilities for storing and/or treating the oil or gas, must be constructed to prevent the escape of contents or ingress of surface water, must never have fluid levels closer than 2 feet to the top of the pit walls, and must not be used for noncombustible fluids (except as these are naturally associated with the combustible wastes).

(4) Well test pits: These are small pits used in testing producing wells for short periods of time. Well test pits must be placed at least 100 feet away from the facilities for storing and/or treating the oil or gas, must be constructed to prevent escape of contents or ingress of surface water, and must maintain a 2-foot freeboard.

When any pit is abandoned, it must be emptied of fluids, backfilled, leveled, and compacted.

There are areas where even use of pits are prohibited. In areas where public water supplies or recreational, wildlife, or fishery resources would be adversely affected (e.g., coastal wetlands), "impervious containers shall be used...{and} the contents removed and properly disposed of within ninety days following usage."

Injection

Annular disposal of produced salt water may be permitted only for one year. The Board's policy is that disposal in the annulus is allowed only where the operator can absolutely show that there is no endangerment to the environment or fresh ground water, and can demonstrate that there is no economic alternative. The applicant must provide the board with an economic study of the well and of the economics of alternative methods of disposal. Generally, such an economic demonstration could only occur in a setting in which there was no well that could be converted to an injection well; this would be required to provide the Board with a radioactive tracer survey to prove that the injected fluid was not leaking through the casing and was entering the correct zone.

Mississippi now has the delegated authority for the regulation of Class II wells. The State issues permits for all injection wells, and operators must obtain permits from the State Oil and Gas Board. The State regulations require information on wells within one-fourth mile of the proposed injection well, injection pressure limited to 75 percent of estimated fracture pressure of the target formation, injection through tubing and packer set no more than 150 feet above the injection zone, and mechanical integrity tests before initial injection after each workover, and every 5 years thereafter. Test pressures are required to be at the maximum authorized injection pressure of 500 psi, whichever is less, provided no testing pressure shall be less than 300 psi.

Offsite Disposal

None, except for pit fluids.

Plugging/Abandonment

All wells that are drilled and found dry must be plugged within 120 days, unless an extension is granted by the Supervisor. A production or service well that ceases to operate must be listed on the Inactive Well Status Report after 6 months. The operator must classify the well as having future utility or having no future utility. If the "future utility" designation is accepted, no further action is necessary. If the latter designation is assigned, the well must be plugged within 120 days.

When plugging a well in which the production casing has been set, if the production casing is not to be pulled, a cement or bridging plug must be placed near the bottom of the casing string to protect any producible pool. If the production casing is to be pulled, the following placements should be made: a cement or bridge plug at the bottom of the production string; a 100-foot cement plug about 50 feet below all freshwater-bearing strata; additional plugs to protect freshwater sands; a 100-foot plug at the bottom of the surface pipe; and a plug at the surface. The remainder of the hole must be filled with mud.

When plugging an uncased hole, 100-foot plugs must be placed to protect each producible pool. Additionally, 100-foot plugs must be placed approximately 50 feet below all freshwater-bearing strata and at the bottom of the surface pipe. A plug must be placed at the surface of the ground so as not to interfere with soil cultivation.

Class II Wells - Plugging Procedure

<u>Plugging and Abandoning</u>

Prior to abandoning an enhanced recovery injection or produced fluid disposal well, the well shall be plugged in a manner which will not allow the movement of fluids either into or between underground sources of drinking water by:

1) isolating the injection zone from the well bore by the use of cement plugs; and
2) such other cement plugs as are deemed necessary by the Board to properly plug the well.

Placement of the cement plugs shall be accomplished by one of the following:

1) the Balance-Plug Method;
2) the Dump Bailer Method;
3) the Two-Plug Method; or
4) an alternative method, approved by the Supervisor, which will reliably provide a comparable level of protection to underground sources of drinking water.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

State of Mississippi, State Oil and Gas Board. 1986. Statutes and statewide rules and regulations. Revised January 31, 1990.

USEPA. 1985. U.S. Environmental Protection Agency. Mississippi Meeting Report. Proceedings of the Onshore Oil and Gas Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communication:

Richard Ball, Mississippi Department of Natural Resources, Bureau of Pollution Control (601) 961-5171.

Jerry Cain, Mississippi Department of Natural Resources, Bureau of Pollution Control (601) 961-5073.

Fred Hille, Mississippi Oil and Gas Board (601) 354-7127.

STATE: Missouri

AGENCIES: Department of Natural Resources (MDNR)
* Division of Geology and Land Survey (DGLS)
Division of Environmental Quality (DEQ)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DEQ) -
Roadspreading - (DEQ) -
Pits - (DGLS-DEQ) - No rules for drilling pits or saltwater disposal pits.
Surface water discharge - (DGLS-DEQ) -
Waste haulers - (DEQ) - No manifest or record keeping requirements.
Burial or landfill - (DEQ) - Dried muds buried.
EOR/injection wells - (DGLS) - Most produced waters injected.

BONDING: Compliance bond required. May be surety bond, certificate of deposit, or letter of credit. Bond is conditioned upon the drilling for oil or gas. Bond amount depends on depth, and ranges from $1,000 to $5,000+ per well. Blanket bonds range from $20,000 to $30,000.

ENFORCEMENT: Available actions include injunctions on sale of product and administrative orders which are initiated by the Attorney General.

COMMENTS: 673 oil wells - no gas wells.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Missouri

Forms completed by: Kenneth L. Deason

Agency: Missouri Department of Natural Resources (MDNR)
Phone: (314) 364-1752

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: MDNR
DGLS

Off-site disposal: MDNR
DEQ

(MDNR - Missouri Dept. of Natural Resources)
(DGLS - Division of Geology and Land Survey)
(DEQ - Division of Environmental Quality)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Division of Geology and Land Survey is the lead agency by legislative mandate.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   4 for the Division of Geology and Land Survey
   1 for the Division of Environmental Quality

2. Legal support; and

   Attorney Generals Office; 1 Attorney dedicated to the Division.

3. Permitting, siting, and administration.

   2

Please indicate, for each agency above, what type of training is needed for your staff.

Division of Geology and Land Survey

1. Geologist
2. Petroleum Engineer
3. Updated EPA courses on inspection/monitoring

Division of Environmental Quality

1. Planner
2. Updated EPA courses on inspection/monitoring.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DEQ	DEQ
b.	Roadspreading	DEQ	DEQ
c.	Pits	DGLS	DEQ
d.	Surface water disposal	DGLS	DEQ
e.	Waste haulers	DEQ	DEQ
f.	Burial or landfill	DEQ	DEQ
g.	Disposal wells	DGLS	DGLS
h.	Enhanced oil recovery injection wells	DGLS	DGLS

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DGLS	DGLS
b.	Clean Water Act (NPDES)	DEQ	DEQ
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEQ	DEQ
	Subpart D (Non-Hazardous)	DEQ	DEQ

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Plugging Bond only

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The Attorney General initiates administrative actions.

Please list the types of enforcement actions available?

1. Administrative order
2. Injunctions on sale of product

MISSOURI

INTRODUCTION

Missouri produced 156,458 barrels of oil from 673 oil wells in 1988. There is no commercial gas production. The State has 9 evaporation pits and 647 injection wells. In 1988, Missouri had a total of 882,333 barrels of produced waters, most of which were injected. Missouri has had no commercial gas production since 1977.

REGULATORY AGENCIES

Two agencies regulate oil and gas activities in Missouri. They are:

* Department of Natural Resources, Division of Geology and Land Survey; and
* U.S. Bureau of Land Management.

The State Oil and Gas Council was formed by Rule 10 CSR 50-1.010 and is composed of the executive heads of the Division of Geology and Land Survey, Division of Commerce and Industrial Development, Missouri Public Service Commission, and two persons with knowledge of the oil and gas industry, appointed by the Governor with the advice and consent of the Senate. The State Geologist, who serves as Director of the Division of Geology and Land Survey, is charged with the duty of enforcing the rules, regulations, and orders of the Council. The State has primacy for UIC program Class II wells.

Federal lands in Missouri are confined to U.S. Air Force bases, but there is drilling on these lands. When a request for a permit to drill is received, the Bureau of Land Management prepares the draft permit, which is issued by the State Oil and Gas Council.

The Department of Natural Resources, Division of Environmental Quality, becomes involved only when there is a breach of a pit dike and a spill of fluids occurs. Appropriate action is then taken under the Division of Environmental Quality regulations.

STATE RULES AND REGULATIONS

Drilling

Rule 10 CSR 50-2.040 provides requirements during the drilling of wells to prevent contamination of either surface or underground freshwater resources. Bonding is required before oil or gas drilling operations are initiated and all wells must be plugged when abandoned.

There are no regulations related to drill pits. Drill pits are not lined. When pit muds dry, the muds are buried onsite.

Produced Waters

There are no regulations related to construction of evaporation/percolation pits for produced waters. About 32,370 barrels of produced waters were put in such pits in 1984.

Remaining produced waters are injected into Class II wells for disposal or enhanced recovery. Injection wells must be completed with strings of casing properly cemented at sufficient depths to protect any freshwater strata. The specific casing and cementing requirements will be based on the depth to the base of the lowest underground drinking water source, the nature of the fluids being injected, and the hydraulic relationship between the injection zone and the base of the underground source of drinking water. Maximum injection pressure must be established by the State Geologist to avoid fracturing the confining zone.

All injection wells must be tested for mechanical integrity before initiating injection and at least every 5 years thereafter. Procedures may include a pressure test, monitoring of annulus pressure after an initial pressure test, or other methods deemed effective by the State Geologist.

Offsite Disposal

Some of the produced fluid is tracked to other injection sites. No manifest is required for the transportation of produced water.

Plugging/Abandonment

Notification is required within 90 days after operations cease, and the Council may specify temporary plugging to prevent pollution of freshwater strata. After 6 months, the operator must plug and abandon the well unless granted an additional 6-month extension for good cause. Further 6-month extensions may be granted, up to a limit of 2 years.

Plugging must assure that all fluids remain in their original strata. Cement plugs must be placed from the bottom of the oil or gas stratum to at least 25 feet above the top of that stratum. Appropriate means must be taken to prevent migration of surface water into a plugged well. Casing must be cut off below plow depth.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil and Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Rules and Regulations of Missouri Oil and Gas Council, June 1985.

USEPA. 1985. U.S. Environmental Protection Agency. Missouri Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

Kenneth Deason, Missouri Oil and Gas Council (314) 364-1752.

STATE: Montana

AGENCIES: Department of Natural Resources and Conservation
Oil and Gas Division

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming -

Roadspreading -

Pits - Permits not required for reserve pits, however, regulations concerning lining and disposal of contents are in place. Saltwater evaporation pits allowed when underlain by tight soil.

Surface water discharge - NPDES program delegated to the state. Currently have 18 facilities permitted under the beneficial use subcategory in the northern part of the state.

Waste haulers - Do not require permit.

Burial or landfill - Burial of reserve pit wastes allowed.

EOR/injection wells - Does not have UIC delegation.

BONDING: Compliance bond required. Bond is conditioned upon proper plugging and abandonment and surface restoration. Bond amount is $5,000 per well or $10,000 blanket bond, which may be increased to $10,000 and $20,000 respectively at the Board's discretion.

ENFORCEMENT:

COMMENTS: No information given on enforcement.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Montana

Forms completed by: Thomas P. Richmond

Agency: Montana Department of Health and Environmental Sciences (DHES), Solid and Hazardous Waste Bureau (SHWB)
Phone: (406) 444-2821

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal:

Off-site disposal: DHES, SHWB

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Department of Natural Resources and Conservation, Oil and Gas Conservation Division

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   DHES, SHWB - 2.5 FTE's, Total

2. Legal support;

   1/6 FTE

3. Permitting, siting, and administration; and

   DHES, SHWB - 2.5 FTE's, Total

Please indicate, for each agency above, what type of training is needed for your staff.

Personnel protection
Sampling of wastes and environmental media
Contracts administration
Inspector training

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

	Disposal on-site	Disposal off-site
a. Landfarming		
b. Roadspreading		
c. Pits		
d. Surface water disposal		
e. Waste haulers		
f. Burial or landfill		DHES, SHWB
g. Disposal wells		
h. Enhanced oil recovery injection wells		

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

	Disposal on-site	Disposal off-site
a. Safe Drinking Water Act (UIC)		
b. Clean Water Act (NPDES)		
c. Resource Conservation & Recovery Act (RCRA)		
Subpart C (Hazardous)	DHES, SHWB	DHES, SHWB
Subpart D (Non-Hazardous)		DHES, SHWB

3. List any financial assurance requirements for oil and gas exploration and production wastes:

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Please list the types of enforcement actions available?

MONTANA

INTRODUCTION

Montana produced 20,079,819 barrels of oil and 52,981,382 billion cubic feet of gas in 1984. Production is from 4,665 oil wells and 2,152 gas wells. A total of 622 wells were drilled for oil and gas in 1985. About 320,000 barrels of produced water per day are produced from the approximately 1,600 full-producing oil wells. The remaining stripper wells each produce about 40 barrels of produced water per day.

REGULATORY AGENCIES

The four agencies that regulate oil and gas activities in Montana are:

* Montana Department of Natural Resources and Conservation, Oil and Gas Conservation Division;
* Montana Department of Health and Environmental Sciences, Water Quality Bureau;
* U.S. Environmental Protection Agency, Region VIII; and
* U.S. Bureau of Land Management.

The Oil and Gas Conservation Division issues drilling permits and regulates the oil and gas industry in Montana. There is a compliance bond. Montana does not have primacy for the UIC program, but the Board of Oil and Gas Conservation is planning to negotiate with EPA on assumption of primacy.

The Montana Department of Health and Environmental Services, Water Quality Bureau, controls water quality issues. The Bureau has primacy for the issuance of NPDES permits.

Region VIII of the Environmental Protection Agency issues UIC permits for the injection of produced water in Montana.

The Bureau of Land Management uses its own form for drilling permits; thus, a driller must obtain a State as well as a Federal permit to drill for oil or gas on Federal lands. The Board of Oil and Gas Conservation has a cooperative agreement with the Bureau of Land Managment concerning spacing of wells and field rules on Federal lands. BLM issued the permits to drill on Indian lands. The Board has no jurisdiction over Indian lands, but does maintain files on those wells if the operation choose to file the permit requests and reports that would be required on other wells.

STATE RULES AND REGULATIONS

Drilling

Permits are not required for drilling pits. The regulations of the Oil and Gas Conservation Division (36.22.1005) require the operator to "contain and dispose" of drilling operation wastes either by removal from the site or burial at least 3 feet below the surface of the land. Further, the operator is required to "construct his reserve pit in a manner adequate to prevent undue harm to the soil or natural water in the area. When a salt base mud system is used as the drilling medium, the reserve pit shall be sealed when necessary to prevent seepage."

The lining requirement for reserve pits is decided case by case, based upon soil composition, slope, drilling, fluids, and proximity to water sources. Fluids may be removed from reserve pits by several methods. Fluids may be removed from reserve pits by several methods. One method is to remove fluids by truck and haul them to another drill site or disposal facility. No manifest is required for transporting fluids. Another method is to allow fluids, other than oil, to remain in a reserve pit for up to a year for evaporation. Alternatively, the fluids may abe treated chemically so that they can be used for beneficial purposes. After the fluids have been removed, the remaining solids are left to dry before backfilling. If a plastic liner has been used, it is folded into and buried in the reserve pit.

Produced Water

Full-producing wells in Montana produce approximately 200 barrels per day of produced water; strippers yield about 40 barrels per day. Most produced water is reinjected, but some is disposed of by evaporation. A small amount is disposed of by discharge for beneficial use.

Rule 36.22.1227 of the Board of Oil and Gas Conservation states that salt or brackish water may be disposed of by evaporation when impounded in excavated earthen pits, which can only be used for such purpose when the pit is underlaid by tight soil such as heavy clay or hardpan. At no time should salt or brackish water impounded in earthen pits be allowed to escape over adjacent lands or into streams.

Rule 36.22.1228 allows salt water to be injected into the stratum from which it is produced or into other proven saltwater-bearing strata. Injection is also permitted to producing formations to enhance production of oil and gas. The UIC program, however, is administered by EPA Region VIII.

NPDES discharge permits are issued by the Water Quality Bureau of the Montana Department of Health and Environmental Sciences for 18 facilities under the beneficial use provision of the wildlife and agricultural use subcategory with a total permitted discharge of 0.6 million gallons per day. Of those issued, only about two of the permitted facilities discharge. Discharges are made to a closed basin in the northern part of the State. Discharge limits include total dissolved solids of less than 1,000 mg/L and an oil and grease limit of 15 mg/L absolute with an average of 10 mg/L. Other discharge limits including phenols and metals are imposed.

Plugging/Abandonment

Once a well is no longer being used for the purpose for which it was drilled, it should be plugged. Nevertheless, a well can remain idle on a field with other producing wells while being held for possible future use (unless causing damage to oil, gas, or freshwater strata). At the point that other wells in that field cease to produce because of depletion of the reservoirs, however, the operator must commence drilling and abandonment operations within 90 days. Before plugging work begins, the operator must submit forms laying out the specific plans for plugging. After approval by the Petroleum Engineer, plugging may proceed.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

Personal Communication:

Abe Horpestad, Water Quality Bureau (406) 444-2459.

Charles Maio, Administrator, Board of Oil and Gas (406) 656-0040.

STATE: Nebraska

AGENCIES: * Oil and Gas Conservation Commission (OGCC)
Department of Environmental Control (DEC)
U.S. Bureau of Land Management

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (OGCC) - Dried drilling muds are spread on land surface prior to backfilling drilling pits.

Roadspreading - (OGCC) - Authorized for production fluids on a case-by-case basis.

Pits - (OGCC) - Produced fluid evaporation pits used in the panhandle portion of the state (60 inches net evaporation annually). Liners sometimes required.

Surface water discharge - (OGCC-DEC) - Production fluids may be discharged under NPDES permit.

Waste haulers - (OGCC) -

Burial or landfill - (OGCC-DEC) -

EOR/injection wells - (OGCC) - Delegated Class II program. Primary method of produced fluid disposal in southwest Nebraska.

BONDING: Compliance bond required. Bond is conditioned upon compliance with all laws, rules and regulations, and Commission orders. Bond amount is $5,000 per well and $25,000 blanket bond.

ENFORCEMENT: Enforcement actions are initiated through the County Attorney or, in some cases, the Attorney General. The Oil and Gas Commission can void an operator's authority to transport oil or gas from the lease, thereby ceasing operation above storage capacities. A violation of the rules is considered a misdemeanor, subject to penalties up to $1,000/day and/or 6 months in prison.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Nebraska

Forms completed by: (name not listed)

Agency: Nebraska Oil & Gas Conservation Commission (OGCC)
Phone: (308) 254-4595

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: OGCC

Off-site disposal: DEC (for NPDES only)

(OGCC - Oil & Gas Conservation Commission)
(DEC - Dept. of Environmental Control)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Statutes provides the Oil & Gas Commission with full authority to regulate disposal of all oil and gas wastes. Our regulations do not allow for release of produced water except that used for beneficial purposes.

However, we do allow release of produced water if the operator secures an NPDES permit through the Dept. of Environmental Control.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No. Both are independent agencies.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   One Petroleum Engineer, two inspectors and secretarial support with assistance from the Director. Approximate expenditure $270,000 annually.

2. Legal support; and

   Provided by Office of the Attorney General

3. Permitting, siting, and administration.

   One Petroleum Engineer or Geologist and secretarial support with assistance from the Director. Approximate expenditure $137,000 annually.

Please indicate, for each agency above, what type of training is needed for your staff.

B.S. Degree Engineering or Petroleum Geology.

Inspectors must have at least 10 years experience in drilling and production and have held a supervisory position.

Periodic training is required for all persons in such matters as the Underground Injection Control programs sponsored by IOCC or UIPC.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

Plugging/Abandonment --

Rule 3-040 TEMPORARILY ABANDONED WELLS Whenever operations cease for a period of sixty (60) days on any well, the operator shall give notice to the Commission of the temporary abandonment. If it is deemed necessary to prevent migration of oil, gas, water or other substances from the formation or horizon in which it originally occurred, the well shall be plugged or repaired. If the operations on any such temporarily abandoned well are not resumed within a period of one (1) year after the notice has been given, the owner or operator of the well shall plug and abandon the well in the manner prescribed by the Director. However, upon application prior to the expiration of the one (1) year period, and for good cause shown, the Director may extend the period for one (1) year. An additional one (1) year extension may be granted in the same manner.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	OGCC	not allowed
b.	Roadspreading	OGCC	OGCC
c.	Pits	OGCC	not allowed
d.	Surface water disposal	OGCC	DEC by NPDES
e.	Waste haulers	OGCC (salt water)	OGCC (salt water)
f.	Burial or landfill	OGCC	not allowed
g.	Disposal wells	OGCC	OGCC
h.	Enhanced oil recovery injection wells	OGCC	OGCC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OGCC	OGCC
b.	Clean Water Act (NPDES)		DEC
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	OGCC	DEC
	Subpart D (Non-Hazardous)	OGCC	DEC

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Each operator must file good and sufficient bond in an amount of not less than $5,000 per well or $25,000 for a blanket bond to insure compliance with the Rules and Regulations of the Commission.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The agencies must initiate action through the County Attorney where the violation takes place. By agreement with the County Attorney, the Office of the Attorney General may be used. In lieu of Court action, the Commission may void authority to transport crude oil or natural gas from a lease.

Please list the types of enforcement actions available?

Violation of a rule or regulation is a misdeamor with each day the act continues is considered to be a separate act and punishable up to a fine of $1,000 per day or up to six months in jail or both.

Form 14, Authorization to Transport Oil and/or Gas from Lease may be cancelled until the violation is abated which in effect shuts-in a lease.

NEBRASKA

INTRODUCTION

Nebraska produces 6,470,000 barrels of oil and 2,347 MM cubic feet of gas each year. Production is from 2,072 oil wells and 18 gas wells. Most of the State production is in two areas: the five-county area in the Denver basin and Red Willow and Hitchcock Counties. Strippers account for about 85 percent of the State production.

REGULATORY AGENCIES

The three agencies that regulate oil and gas activity in Nebraska are:

* Nebraska Oil and Gas Conservation Commission;
* Nebraska Department of Environmental Control; and
* U.S. Bureau of Land Management.

The Nebraska Oil and Gas Conservation Commission regulates industry practices and procedures with regard to construction, location, and operation of onsite drilling. The Commission issues permits for oil and gas drilling and UIC Class II wells. The Commission has three members who are appointed by the Governor. At least one member must have experience in oil or gas production.

Nebraska is an NPDES-delegated State. The Nebraska Department of Environmental Control issues all NPDES permits and regulates all other classes of UIC wells.

The Bureau of Land Management has jurisdiction over drilling and production on Federal lands. The Bureau is addressed in a separate section.

STATE RULES AND REGULATIONS

Drilling

When drilling is complete, the supernatant in mud pits is allowed to evaporate. The muds in use are generally freshwater gels. After the mud pit has dried, the residues are landspread and the pit is backfilled.

Production

Under Rule 3.002, "No salt water, brackish water, or other water unfit for domestic, livestock, irrigation, or general use shall be allowed to flow over the surface or into any stream or underground fresh water zone." Produced water may be disposed of by evaporation pits, road spraying, or injection.

Pits

Generally, evaporation pits are used in the panhandle where net evaporation is as high as 60 inches annually. Under Commission Rule 3.022, retaining pits must be permitted. The Commission approves or disapproves the pit upon receipt of the application. The pits are required to be lined or constructed with impermeable material when the underlying soil conditions would permit seepage to reach subsurface freshwater zones. They must have the capacity for at least three times the average fluid influx into the facility.

This rule does not apply to burn pits or emergency pits. Burn pits are required to be a safe distance from any other structure, and must be constructed to prevent any materials from escaping from the pit or surface water from entering the pit. Open pit storage of oil is only allowed during an emergency or by special permission from the Director of the Commission.

Road Spraying

Road spraying of produced water is considered on a case-by-case basis. When allowed, spraying must be done with a spreader bar and in such a way as to prevent runoff.

Injection

In southwest Nebraska, most produced waters are reinjected, either into disposal or enhanced recovery wells. There are about 500 Class II wells in Nebraska and most are used for enhanced recovery. Injection wells must be completed, maintained, and operated to confine injected fluids to approved formations, and to prevent pollution to fresh water or damage to sources of oil or gas. Along with injection well applications, information must be submitted on other wells within one-half mile of the proposed injection well, as well as a demonstration that injection will not lead to vertical fractures allowing injection or formation fluids to enter freshwater strata. Injection must be through adequate casing or casing and tubing. Mechanical integrity tests must be at 125 percent of the maximum authorized injection pressure or 300 psi, whichever is greater. (Alternatively, for wells without tubing and packer, the operator should record the actual injection pressure weekly and report it monthly.)

Plugging/Abandonment

There are no specific time requirements related to plugging of a well. It is State policy to encourage operators not to permanently plug wells that have any further potential for secondary recovery operations. Before plugging, the operator must notify the Director of the plans for plugging, but the regulations make no mention of specific requirements for positive approval or for having witnesses to the plugging.

The well must be plugged with "mud-laden fluid, cement, mechanical plug, or some other suitable material" in order to prevent migration of oil, gas, or water from the strata of origin.

References

Coubrough, Rob. State regulatory information submitted in 1985.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Nebraska Oil and Gas Conservation Commission. Rules and regulations, December 1985.

USEPA. 1985. U.S. Environmental Protection Agency. Nebraska Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

STATE: Nevada

AGENCIES: Department of Wildlife (DOW)
Department of Minerals (DOM)
Department of Conservation and Natural Resources
* Division of Environmental Protection (DEP)
Department of Transportation (DOT)
U.S. Bureau of Land Management

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DEP) -
Roadspreading - (DEP) -
Pits - (DEP-DOW) - Reserve pits are used to evaporate all drilling fluids.
Surface water discharge - (DEP) -
Waste haulers - (DOT) -
Burial or landfill - (DEP) -
EOR/injection wells - (DOM-DEP) - Delegated Class II program. Dispose of 700,000 barrels of produced fluids annually in six disposal wells.

BONDING: Compliance bond required on non-federal lands. Bond is conditioned upon well plugging or repair of wells causing waste. DOM requires bond amount of $10,000 per well or $50,000 blanket bond. DEP requires sufficient bond to cover plugging and abandonment and will recognize bonds on federal land.

ENFORCEMENT: Enforcement actions are initiated by the lead agency and are administratively determined by the state Environmental Commission. Actions available include fines up to $1,000/day and court injunctions by DOM. Violations of DEP regulations include fines up to $25,000 per day per occurrence and court injunctions.

COMMENTS: During 1988, Nevada produced 3,217,000 barrels of oil from 37 producing wells. Of these, all but two are on Federal land. There are two oil/gas wells producing gas in non-commercial quantities. That gas is used at the well location for surface facilities (generator, heater-treater).

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Nevada

Forms completed by: Russ Fields

Agency: Nevada Dept. of Minerals (DOM)
Phone: (702) 885-5050

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DEP
DOW

Off-site disposal: DEP

(DEP - Division of Environmental Protection)
(DOW - Dept. of Wildlife)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

DOW has jurisdiction over wildlife and specific requirements regarding fencing and netting etc. to limit wildlife access to sumps, mudpits, etc. DEP has overall jurisdiction regarding releases to the environment.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

The Division of Environmental Protection is part of the State Department of Conservation and Natural Resources; The Department of Wildlife is a separate agency in the executive branch of the State government.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   One (1) person for each agency

2. Legal support; and

   Deputy Attorney General assigned

3. Permitting, siting, and administration.

   DEP has one permitting officer who reviews and issues permits. DOM has pofice clerical staff as needed. These activities are a small portion of overall DOM activities and are not budgeted separately. Estimate $75,000 per agency.

Please indicate, for each agency above, what type of training is needed for your staff.

DEP: Environmental Engineer (BS - 4 yr. institution or degree in scientifically related field)

DOW: Wildlife Biologist or equivalent (BS - 4 yr. institution)

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DEP	DEP
b.	Roadspreading	DEP	DEP
c.	Pits	DEP & DOW	DEP & DOW
d.	Surface water disposal	DEP	DEP
e.	Waste haulers	n/a	DOT
f.	Burial or landfill	DEP	DEP
g.	Disposal wells	DOM & DEP	DOM & DEP
h.	Enhanced oil recovery injection wells	DOM & DEP	DOM & DEP

(DEP - Division of Environmental Protection)
(DOW - Dept. of Wildlife)
(DOT - Dept. of Transportation)
(DOM - Dept. of Minerals)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DEP	DEP
b.	Clean Water Act (NPDES)	DEP	DEP
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEP	DEP
	Subpart D (Non-Hazardous)	DEP	DEP

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Drilling - $10,000 bond (eg. certificates of deposit) per well or $50,000 statewide bond.

Production Wastes - None

Plugging and Abandonment - Sufficient to cover costs or $50,000 blanket bond.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Enforcement actions are initiated at the agency level then administratively determined by a commission (in the case of DEP, the State Environmental Commission). No specific memoranda of understanding.

Please list the types of enforcement actions available?

Fines: $1,000 per day per violation of drilling regulations; $25,000 per day per occurrence or violation for discharge without a permit.
Injunction: Court ordered shutdown.

NEVADA

INTRODUCTION

During 1989, Nevada produced 3,214,000 barrels of oil from 46 producing wells. Of these wells, all but two are on Federal Land. Approximately 700,000 barrels of oil field brine are disposed of annually in a total of six disposal wells. Five of these disposal wells are located in the Railroad Valley, Nye County area - the major oil producing area of Nevada. The other disposal well is in the Pine Valley, Eureka County area. Reserve pits (sumps) are used to evaporate all drilling fluids. On October 5, 1988, the Nevada Division of Environmental Protection was given regulatory primacy in the area of underground injection control.

REGULATORY AGENCIES

The three agencies that regulate the oil activity in Nevada are:

* Nevada Department of Minerals;
* Nevada Department of Conservation and Natural Resources, Division of Environmental Protection (primacy October 5, 1988); and
* Bureau of Land Management (BLM).

The Nevada Department of Minerals, created as a single State department by the State Legislature in 1983, regulates the industry on the State level with respect to construction, location, and operation of onsite drilling and producing, and issuing all operation permits. Operators must obtain permits from both the Department and BLM.

The Division of Environmental Protection in the Department of Conservation and Natural Resources has adopted Underground Injection Control Regulations governing the use of all types of injection wells. Operators must obtain permits to inject or discharge to the surface any oil field water.

The Division also regulates the disposal of solid waste and supervises the cleanup of any major spills of pollutants. The discharge of any produced waters during the exploration and testing phase is also regulated. Depending on the quality of the discharge waters and the nearby surface and ground waters, discharge to the surface may or may not be allowed.

The Division has jurisdiction over quality of the waters of the State, both surface and ground waters, and regulates water affecting activities on State and Federal lands.

The Bureau of Land Management has jurisdiction over drilling and production on Federal lands. For such drilling, the Bureau of Land Management handles all Applications to Drill. The Bureau requires extensive environmental documentation, including environmental assessments, and, in some cases, may require environmental impact statements for drilling on Federal land.

Further discussion of BLM regulations can be found in the section on Federal regulations. (See Volume 1, Chapter VII.)

STATE RULES AND REGULATIONS

The Regulations and Rules of Practice and Procedures under Chapter 522 of the Nevada Revised Statutes of the Oil and Gas Conservation Law were adopted on December 20, 1979 and revised by the State Commission on Mineral Resources on July 15, 1987. Section 522.260.2 of these rules states that: "All fresh waters and waters of value or possible value for domestic, commercial or stock purposes must be confined to their respective strata and be adequately protected by methods approved by the department. Precautions must be taken in drilling and abandoning wells to guard against any loss of any fresh water from the strata in which it occurs, and the contamination of any fresh water by objectionable water or any oil or gas." Procedures for underground disposal of water are provided in the rules, Section 522,380. Surface discharges are regulated by DEP and require permission from that

agency (as well as BLM on Federal Land). The regulations govern the "drilling, safety, casing, production, abandoning and plugging of wells." Section 522.455, however, states that all excavations must be drained and filled and the surface leveled so as to leave the site as near to the condition encountered when operations were commenced as practicable. Section 522.350 declares that "Oil or oil field wastes may not be stored or retained in unlined pits in the ground or open receptacles except with the approval of the Department." Finally, Section 522.380 states, "The underground disposal of salt water, brackish water, or other unfit for domestic, livestock, irrigation or other use, is permitted only upon approval of the Executive Director."

Plugging is required for wells with production casing that have not been operated for a year, and for wells without producing casing in which drilling operations have ceased for 30 days. Six-month extensions may be granted for good cause. Plugging must be done with cement and heavy mud in order to seal hydrocarbon or water formations.

References

Nevada Department of Conservation and Natural Resources, Division of Mineral Resources. Regulations and rules of practice and procedures. Chapter 522. December 20, 1979.

Nevada Department of Minerals. Regulations and rules of practice and procedures. Chapter 522. July 15, 1987.

Nevada Water Pollution Control Law, Nevada Revised Statutes, Chapter 445.

Underground Injection Control Regulations, Nevada Administrative Code 445.422 thru 445.4278.

USEPA. 1985. U.S. Environmental Protection Agency. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

Dan Gross, Division of Environmental Protection, Department of Conservation and Natural Resources, September 26, 1986 (702) 885-4670.

Ellis Hammett, Permit Processor, Nevada Bureau of Land Management, September 26, 1986 (702) 784-5123.

Nate Lau, Director, UIC Division, EPA Region IX, September 26, 1986 (415) 974-0893.

Cathy Loomis, Engineering Technician, Nevada Department of Minerals, September 26, 1986 (702) 885-5050.

STATE: New Mexico

AGENCIES: Oil Conservation Commission
Energy, Minerals and Natural Resources Department
* Oil Conservation Division (OCD)
Environmental Improvement Division (EID)
U.S. Bureau of Land Management on Federal Lands (BLM)
U.S. EPA (NPDES)
Tribal/EPA on Indian lands

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (OCD) -

Roadspreading - (OCD) -

Pits - (OCD) - Requirements for saltwater storage or disposal pits established in regional orders. Liners required in some areas. Rule for commercial pits.

Surface water discharge - (OCD-EID) - Not allowed without NPDES.

Waste haulers - (OCD) - Must be registered, but no records of source, destination, volume or waste type required.

Burial or landfill - (OCD) - Onsite and Offsite

EOR/injection wells - (OCD) - Delegated Class II program. Over 90% of produced water is reinjected for enhanced recovery or disposal.

BONDING: Compliance bond required, in the form or a surety or cash bond. Bond is conditioned upon proper plugging and abandonment. Bond amount is $5,000 to $12,500 per well, depending on depth, or $50,000 blanket bond. A $25,000 bond is required for waste disposal facilities and oil reclamation plants.

ENFORCEMENT: Division can rescind operating authority, cancel allowables, or shut in wells in limited circumstances. Attorney General initiates injunctive relief, collection of civil penalties, and seizure of illegal product.

COMMENTS: Farmers can contract to use produced water for livestock watering.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: New Mexico

Forms completed by: David Boyer

Agency: New Mexico Oil Conservation Division (OCD)
Phone: (505) 827-5812

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: OCD
BLM
EPA
Tribal/EPA

Off-site disposal: OCD
EPA
Tribal/EPA

(OCD - Oil Conservation Division)
(BLM - Bureau of Land Management)
(EID - Environmental Improvement Division)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

On-site: On non-Indian Federal lands, dual jurisdiction with BLM. On Indian lands, OCD jurisdiction unresolved.

Off-site: OCD jurisdiction except EPA-UIC on Indian lands. On- and off-site EPA-NPDES for discharges to surface water (with state certification of NPDES permits by EID).

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

Flow chart for OCD organization

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   18 staff - $664,000

2. Legal support; and

   2 staff - $103,000

3. Permitting, siting, and administration.

   7 staff - $629,000

Please indicate, for each agency above, what type of training is needed for your staff.

The type of training necessary for staff is obviously dependent on the complexity of the job. Field inspectors need an understanding of the regulations and oil-field practices to properly do their job. Persons issuing permits need these plus technical (geology, engineering) skills to properly evaluate applications. New Mexico has expanded its program to include evaluation of water quality and other environmental aspects of liquid and solid waste disposal at off-site disposal facilities and at gas plants and refineries.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	OCD	OCD
b.	Roadspreading	OCD	OCD
c.	Pits	OCD	OCD
d.	Surface water disposal	OCD/EPA	OCD/EPA
e.	Waste haulers	OCD	OCD
f.	Burial or landfill	OCD	OCD
g.	Disposal wells	OCD	OCD
h.	Enhanced oil recovery injection wells	OCD	OCD

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OCD	OCD
b.	Clean Water Act (NPDES)	EPA/EID	EPA/EID
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	EID	EID
	Subpart D (Non-Hazardous)	OCD	OCD

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Drilling: Cash or surety one-well plugging bond between $5,000 and $12,500 depending on depth of well and county. $50,000 blanket plugging bond.

Crude oil reclamation plants and off-site surface-waste disposal facilities: $25,000 cash or surety bond.

Injection wells: Same as drilling

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Both - Actions initiated by Attorney General include injunctive relief to restrain violators, collection of civil assessments, seizure of illegal product. Division can rescind operating authority, cancel allowables, or shut-in wells in limited circumstances.

Please list the types of enforcement actions available?

Criminal penalties including fine or imprisonment, civil penalties - both through A.G. action; Division action as shown above.

NEW MEXICO

INTRODUCTION

New Mexico produced 71.2 million barrels of oil and 781.2 billion cubic feet of gas in 1988, ranking fourth in U.S. gas production and seventh in U.S. oil production. Production is from 22,504 oil wells and 18,950 gas wells. Twenty percent of oil production is from the stripper well category.

REGULATORY AGENCIES

The following agencies have responsibilities for regulating oil and gas activities in New Mexico:

* New Mexico Oil Conservation Division of the Energy, Minerals and Natural Resources Department;
* New Mexico Oil Conservation Commission;
* New Mexico Water Quality Control Commission;
* U.S. Environmental Protection Agency; and
* U.S. Bureau of Land Management.

The Oil Conservation Division of the Energy, Minerals and Natural Resources Department is responsible for regulating oil and gas industry exploration and drilling, production, and refining. It's duties include regulation of non-"hazardous" liquid and solid wastes from these operations to protect water quality, public health and the environment.

The Oil Conservation Commission has "concurrent jurisdiction and authority with the Division to the extend necessary for the Commission to perform its duties as required by law." The three members of the Commission are the Commissioner of Public Lands, the Director of the Oil Conservation Division, and an appointee of the Secretary of the Department having expertise in petroleum. The Commission serves as an appeal body for permit applicants who object to decisions of the Division; the applicant must seek review from the Commission before going to court. The Commission may also initiate rules and orders to be administered by the Division, as in the case of Orders R-3221 and R-7940, which restrict surface discharges of produced water in areas of the State with vulnerable aquifers (See below).

Although New Mexico has statewide rules require that all fresh surface and ground waters be protected from contamination, relatively few statewide regulations provide specifics on fresh water protection from oil and gas discharges because of the wide diversity of the climate, geology, and quantity and type of waste that is produced.

The Oil and Gas Act also allows for the adoption of special rules or orders tailored to the particular characteristics of a production area. As a result, rules have been adopted controlling specific disposal practices in various geographic areas of the State.

The Oil Conservation Division has primary responsibility under the Federal Safe Drinking Water Act for Underground Injection Control of oil and gas fluids for disposal or secondary recovery except on Indian Lands where U.S. EPA retains jurisdiction. Statewide UIC rules have been adopted, and there is a plugging bond requirement that endures until well abandonment has been approved by the Division.

The U.S. EPA has the responsibility for NPDES permitting in New Mexico; however, the Environmental Improvement Division of the New Mexico Health and Environment Department certifies those permits. No NPDES permits have been issued for the New Mexico oil and gas industry drilling and production facilities.

The Water Quality Control Commission (WQCC) is an interagency commission with members from several State government agencies, including the Environmental Improvement Division and the Oil Conservation Commission. The WQCC is responsible for the development of water quality control standards and water pollution regulations. It delegates the administration of the regulations it develops to constituent agencies. The WQCC is prohibited from taking any action that would interfere with the exclusive authority of the Oil Conservation Commission over all persons and things necessary to prevent water pollution resulting from oil and gas operations.

The Oil Conservation Division administers WQCC regulations at oil refineries, natural gas processing facilities, brine manufacturing operations and oil field service companies.

The U.S. Bureau of Land Management (BLM) takes the lead in oil and gas drilling activities on Federal and Indian lands. When drilling on Federal land occurs, the BLM issues a drilling permit, but concurrence by the State is required. The State maintains primacy in waste disposal activities associated with any drilling or production activities.

Issues involved when drilling on Indian lands currently remain unresolved. Some tribes have issued regulations concerning oil and gas drilling and production activities. Other tribes have applied for UIC program delegation. The State has not waived jurisdiction over the regulation of the oil and gas industry on indian lands, however. Nevertheless, in instances where tribal regulations go beyond those of the State, the tribal regulations prevail.

STATE RULES AND REGULATIONS

In New Mexico, general rules prohibit waste of the resource and require all persons to prevent contamination of fresh waters. However, many rules were developed in response to problems identified or anticipated in particular production areas in the State.

In the southeast, contamination is only now bring detected that resulted from oil and gas activities which occurred three or four decades ago. These cases may be related to improper casing, pit construction, improper plugging, or any number of practices. Contamination includes increases in chlorides and total dissolved solids, dissolved aromatic and phenolic hydrocarbons, and natural gas.

In northwest New Mexico, contamination has mainly involved the seepage of natural gas into water wells. An active plugging program for old abandoned wells is in effect. Since little ground water monitoring has been performed in northeast New Mexico, the extent of contamination from casing leaks or unlined pits is unknown. In many areas, contamination is unlikely because of deep ground water; thick, low permeability vadose zones; and small volume discharges. Additional investigations are being carried out by the Division in shallow ground water areas.

Drilling

There is a general regulatory requirement that the operator must provide a drilling pit sufficient for the accumulationof drill cuttings, and that drilling fluids and drill cuttings must be disposed of at the well site in a manner that will prevent contamination of surface or subsurface waters. There are, however, no specific rules on construction of such pits. The District Supervisor would be responsible for determining if a potential problem exists in vulnerable fresh water zones.

No drilling fluids are authorized to be discharge to the surface waters. Land application is generally not done, although there are no specific statewide rules on land farming. The reserve pits are usually dried out through evaporation and the dried muds are buried in the pits. The areas of New Mexico in which oil and gas drilling occurs have significant net evaporation. In the southeast, annual rainfall averages 14 to 17 inches with 80 inches of evaporation. In the northwest, rainfall averages 7 to 12 inches annually and evaporation is 40 to 50 inches.

Removal of drilling fluids or drill cuttings for offsite disposal must be approved by the appropriate District Supervisor. Pits are generally required to be closed within six to twelve months.

Produced Waters

Storage/Disposal Pits

Regional Orders determine the requirements for saltwater storage or disposal pits in the areas of the State where oil and gas production predominates. In 1967, Order No. R-3221 prohibited most surface disposal of produced waters in a four-county area in southeastern New Mexico. In 1985, another set of regional regulations (Order No. R-7940) was established, effective January 1, 1987, for areas in the northwestern part of the State with potentially vulnerable aquifers.

In the southeast, Order R-3221 prohibits the disposal of produced water onto the ground or into unlined pits because of the presence of shallow ground water, which could be adversely affected by the produced water. An exemption is made for pits receiving no more than 1 barrel/day per 40-acre tract, with a maximum of 16 barrels/day for any pit. An amendment to the Order No. R-3221-B excepted areas in the four counties where the only water present was already highly saline.

In the northwest, Order R-7940 defines areas where aquifers are vulnerable to the effects of produced water and prohibits unlined pits in such areas. Exemptions are made (as long as ground water depth is at least 10 feet) if a pit receives no more than five barrels per day of produced water and the water is less than 10,000 mg/1 TDS, or if the pit receives no more than one-half barrel per day.

Lined pits may be permitted in areas where unlined pits have been prohibited. Order R-3221-C states that "the utilization of lined evaporation pits is feasible and in the interest of good conservation practices, prohibits they are properly designed, constructed and maintained." Order R-7940 authorizes administrative approval of lined pits or below grade tanks within the Vulnerable Area "upon a proper showing that the tank of lined pit will be constructed and operated in such a manner as to safely contain the fluids to be placed therein and to detect leakage therefrom."

Operators must obtain approval from the Division for lined pits, and appropriate requirements for pit construction are found both in R-3221-C and in Division "Guidelines for the Design and Construction of Lined Evaporation Pits." R-3221-C requires that the pits provide at least 600 square feet of evaporative surface for each barrel deposited in the pit on a daily average basis throughout the year, and that the lease or leases served by the pit should have an even or decreasing rate of water production. Header pits must be provided to prevent oil from reaching the evaporation pits. Pits must be lined with an impervious material at least 30 mils in thickness and have leak detection capability.

Other Surface Discharge

No NPDES permits have been issued for discharge of produced waters, and no discharges to surface waters are allowed withouth an NPDES permit. However, individual farmers may contract to use produced water as drinking water for cattle. Agreement must be obtained from the District Supervisor. No specific limits are placed on produced water used for this purpose, nor does the approval of the District Supervisor constitute certification that the quality of the produced water is satisfactory for such a purpose.

Injection

Over 90 percent of the produced water is reinjected into wells for enhanced recovery (4834) or saltwater disposal wells (328). The Oil Conservation Division has responsibility for the Class II UIC injection permitting program.

Generally, disposal of produced waters into zones containing waters of 10,000 mg/l or less TDS will not be permitted except after notice and hearing, unless the water being injected is of higher quality than the native water in the zone. The Division may establish exempted aquifers for such zones, however, where such injections may be approved administratively.

Regulations impose the general requirement that injection wells must be cased with safe and adequate casing or tubing to prevent leakage, and the casing or tubing must be set and cemented to prevent the movement of formation or injected fluid from the injection zone into any other zone or to the surface around the outside of any casing string.

Failure of any injection well must be reported immediately. Where injected fluids have not been confined to the authorized zone or zones the wells may be restricted as to volume or pressure of injection, or shut in until the failure is identified and corrected.

Before injection, wells must be tested to assure the "initial integrity of the casing and the tubing and packer, if used, including pressure testing of the casing-tubing annulus." Tests should last for 15 minutes at pressures in the range of 250 to 300 psi, within a maximum variance of 10 percent. Additional tests are requried at least every 5 years.

Offsite Disposal

Production and drilling wastes are sometimes sent to commercial or centralized surface disposal or collection facilities. Commerical facilities are those receiving compensation. Centralized facilities are noncommercial facilities "receiving produced water, drilling fluids, drill cuttings from any off-well-site location for collection, disposal, evaporation, or storage in surface pits, ponds, or below grade tanks." The Commission issued Order No. R-7940-A in 1986 to regulate such offsite facilities in the northwest. Subsequently, a statewide rule was adopted setting standards for offsite commercial facilities.

Besides basic facility information, OCD Rule 711 requires submittal of: 1) Detailed engineering plans for pits, liners, dikes, piping sprayers and tanks; 2) A disposal plan, contingency plans and closure plans; 3) Proposed inspection, reporting and recordkeeping requirements; and 4) A fresh water protection demonstration. A $25,000 survey surety or cash bond is required to be posted with the Division prior to construction.

A provision in the rules requires public notification by the proposed operator of all land owners and occupants within one-half mile of the state. This allows public comment on the proposal prior to approval, but the OCD cannot disapprove an application based only on land use issues or citizen dislike.

For commerical pits, the Division may approve use of either lined or unlined pits, so long as they are constructed adequately to protect fresh water. Where lining is required, pits must be lined according to the provisions of the "Guidelines" for lined evaporation pits. The "Guidelines" require that the pit must provide the minimum evaporative surface necessary for the maximum yearly volume of water to be discharged to the pit. It should have adequate freeboard to protect against wave action, and levees at least 18 inches above the ground for runon/runoff protection. It must have a double liner system, with a leak detection system between the top and bottom liners. Synthetic liners must be at least 30 mil thick. Skimmer ponds or tanks must be used to separate any oil from the water prior to its discharge to the evaporation pit. Clay lined facilities may be appproved only after strenuous documentation that fresh ground water will not be impacted; ground water monitoring is required.

Transporters of oil field wastes must register, but need keep no records of source, destination, and volume of the specific wastes hauled.

Plugging/Abandonment

Wells cannot be temporarily abandoned for more than one year unless a permit for temporary abandonment has been approved by the Division. The maximum period of the permit is 5 years.

Before a permit for temporary abandonment can be granted, the well must have passed a mechanical integrity test to prevent damage to producing zones or contamination of fresh water. A one-well plugging bond may be required for any well granted a permit for temporary abandonment.

Specific well plugging plans must be approved by the Division. The general regulatory requirement is that plugging must "confine all oil, gas, and water in the separate strata originally containing them. This operation shall be accomplished by the use of mud-laden fluid, cement and plugs, used singly or in combination as may be approved by the Division."

The Division has a reclamation fund for use in locating and plugging abandoned wells. The fund fluctuates between $500,000 and $1,000,000 and is replenished with a tax on production. The fund has been used extensively in the San Juan Basin to plug shallow gas wells.

Solid Wastes

In 1989, the New Mexico Legislature assigned responsibility for proper disposal of all non-"hazardous" solid wastes to the Oil Conservation Division. These includes wastes from exploration, drilling and production, and associated wastes at natural gas plants, refineries, and from the oil field service industry. The statute authorizes the Division to regulate these wastes in a manner "to protect public health and the environment."

In response to documented cases of wild fowl being killed by oily wastes in pits, the Commission in 1989 adopted a statewide order (R-8952) prohibiting the use of any size open netted pits, and tanks exceeding 16 feet in diameter. The rule allows a written exception to screening, netting, or covering if a showing is made that the pit or tank does not contain oil (e.g. fresh or salt water pits), or that an alternative method protects migratory birds.

References

Boyer, D.G., "Oil Conservation Division Program for Ground Water Protection". In proceedings of the New Mexico Water Resources Research Institute 32nd Annual New Mexico Water Conference, Ground Water Management, Albuquerque, WRRI Report No. 229, February, 1988, p. 138-157.

Chavez, Frank, 1985, Management and regulation of drilling waste disposal: The New Mexico approach. Proceedings of a National Conference on Disposal of Drilling Wastes. University of Oklahoma Environmental and Ground Water Institute, Norman, Okla., pp. 151-164.

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Order of the Oil Conservation Commission of the State of New Mexico, Order Nos. R-3221, and R-3221-A through D; Nos. R-7940 and R-7940-A; No. R-8662; and No. R-8952.

State of New Mexico. Water Quality Control Commission regulations. December 24, 1987.

State of New Mexico, Energy Mineral Department, Oil Conservation Division. Rules and Regulations, 1989.

USEPA. 1985. U.S. Environmental Protection Agency. New Mexico Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

STATE: New York

AGENCIES: Department of Environmental Conservation (DEC)
- Division of Water (DOW)
- Division of Mineral Resources (DMN)
- Division of Hazardous Substance Regulation (DHSR)
- Division of Solid Waste (DSW)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DSW) -

Roadspreading - Roadspreading of production fluids regulated by local governments.

Pits - (DMN-DHSR) - Liner and closure requirements in rules.

Surface water discharge - (DOW) - NPDES authority delegated as SPDES. Primary method of disposal of waterflood waters.

Waste haulers - (DHSR) - Manifest system in place in connection with roadspreading.

Burial or landfill - (DSW) - Contaminated muds disposed in certified landfills. Other wastes buried on-site.

EOR/injection wells - (DMN-DOW) - Does not have UIC primacy.

BONDING: Compliance bond required. Bonds are conditioned upon plugging and abandonment and surface restoration. Bond amount depends on depth and number of wells, and ranges from $2,500 to $2,000,000

ENFORCEMENT: Administrative actions include summary abatement orders for emergency situations, shut-in of production, suspension of carriage and transportation of product, general compliance enforcement and monetary penalties. Civil and criminal remedies available through the Attorney General.

COMMENTS: There is the potential for different standards in the area of roadspreading because so many local entities are involved.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: New York

Forms completed by: Sandra F. Brennan

Agency: New York State Department of Environmental Conservation (DEC)
Phone: (518) 457-3682

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Drilling Wastes - DEC DMN
Production Wastes - DEC DOW

Off-site disposal: Transportation of Drilling & Production Wastes - DEC DHSR
Disposal Well - DEC DOW, & DMN

(DEC DMN - Dept. of Environmental Conservation, Division of Mineral Resources)
(DEC DHSR - Dept. of Environmental Conservation, Division of Hazardous Substance Regulation)
(DEC DOW - Dept. of Environmental Conservation, Division of Water)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The New York State Department of Environmental Conservation (DEC) has jurisdiction over disposal of all wastes. Within the DEC, specific duties are handled by divisions. The Division of Mineral Resources (DMN) regulates oil and gas drilling and most related on-site disposal. The Division of Water (DOW) regulates all NPDES fluid discharges both on and off-site. DMN and DOW each regulate certain aspects of disposal wells. The Division of Hazardous Substance Regulation (DHSR) oversees the waste haulers and the Division of Solid Waste (DSW) regulates land spreading of wastes.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

Yes

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   Staff: DMN, 18; DOW, 1; DHSR, 1

2. Legal support; and

   Staff: DMN, 1*; DOW, *; DHSR, *
   *Legal support is available through the Division of Legal Affairs and the Division of Environmental Enforcement.

3. Permitting, siting, and administration.

   Estimated Funding: DMN, $900,000; DOW, $80,000; DHSR, $50,000

Please indicate, for each agency above, what type of training is needed for your staff.

1. Periodic training in state-of-the-art techniques for specific regional conditions for DMN staff.

2. Coordinated field workshops for EPA and DEC staff might facilitate development of regional solutions for regional problems.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

The information is generally acceptable, but dated. The section on Plugging/Abandonment quotes out-of-date regulations. The procedures approved in the field are different from the quoted regulations. Other areas of discrepancy include the information on drilling muds.

1. WHAT AGENCY REGULATES:

	Disposal on-site	Disposal off-site
a. Landfarming	DEC DSW	New York State DSW
b. Roadspreading		Town, County, DEC DHSR
c. Pits	DEC DMN	DEC DHSR
d. Surface water disposal	DEC DOW	DEC DOW
e. Waste haulers	DEC DHSR	DEC DHSR
f. Burial or landfill	DEC DSW	DEC DSW
g. Disposal wells	DEC DMN & DOW	DEC DMN & DOW
h. Enhanced oil recovery injection wells	DEC DMN	DEC DOW

(DEC DSW - Dept. of Environmental Conservation, Division of Solid Waste)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

	Disposal on-site	Disposal off-site
a. Safe Drinking Water Act (UIC)	- -	- -
b. Clean Water Act (NPDES)	DEC DOW	DEC DOW
c. Resource Conservation & Recovery Act (RCRA)		
Subpart C (Hazardous)	DEC DHSR	DEC DHSR
Subpart D (Non-Hazardous)	DEC DSW	DEC DSW

3. List any financial assurance requirements for oil and gas exploration and production wastes:

No financial security requirements exist for disposal of oil and gas wastes. DMN requires financial security for plugging and surface restoration to include filling of all pits.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Enforcement actions can be handled by this agency through administrative enforcement proceedings or, at our discretion, may be referred to the State's General Attorney for civil or criminal prosecution. Depending on the nature of the action, the Department may elect to proceed administratively and has legal staff available in its central office, and in nine regional offices, to undertake enforcement action.

Please list the types of enforcement actions available?

Collections, summary abatement, injunction, shut-in order, all levels of local and regional courts

The Department's administrative enforcement options are various: Summary abatement to react to immediate and extreme environmental and/or health and safety risks, shut-ins of production, suspension of carriage and transportation of product, general oil and gas regulatory compliance enforcement (e.g. financial security for plugging and abandonment compliance, determinations of abandonment leading to well-plugging orders, site remediation) and monetary penalties.

The Department may also refer matters to the State Attorney General for civil or criminal enforcement of regulatory requirements (e.g. injunction against environmental hazards, environmental remediation, well plugging and abandonment) and collections of monetary obligations (financial security covering well plugging and abandonment). The Attorney General may also independently commence civil or criminal actions in the interest of the people of the State where its investigatory staff determine that state environmental regulations have been violated. Such actions are commenced with the cooperation of the Department and the Division of Mineral Resources.

NEW YORK

INTRODUCTION

New York is one of the pioneer States for oil and gas production and use. Proven oil reserves were documented in 1627 and drilling began in the late 1800s. Since then it is estimated that 40,000 to 60,000 wells have been drilled in New York.

Preliminary reports indicate that New York produced 496,000 barrels of oil from 4,368 wells in 1989. Twenty-five and one-half billion cubic feet of natural gas were produced from 5,315 gas wells in 1989.

REGULATORY AGENCIES

Background

In 1963 the New York legislature passed laws regarding oil and gas operations. A working permitting system was instituted in 1966 under the purview of the Department of Environmental Conservation. The regulations have been revised frequently over the last 20 years. In fact, further revisions are expected in the next few years as a result of a Generic Environmental Impact Statement scheduled for completion in late 1987.

Agencies

Oil and gas activities in New York are regulated by:

* New York Department of Environmental Conservation;
* Bureau of Land Management (Federally-held mineral rights only); and
* U.S. Forest Service (surface activities in U.S. forests).

Most oil and gas activites in New York are regulated by the Department of Environmental Conservation (DEC). The Department is authorized to regulate the "development, production, and utilization of natural resources of oil and gas...in such a manner that a greater ultimate recovery of oil and gas may be had." DEC also has authority for "prevention of pollution and migration." New York is NPDES-delegated, with the Department of Environmental Conservation responsible for the SPDES program. New York does not have UIC primacy.

An Oil, Gas, and Solution Mining Advisory Board (with 11 members, a majority of whom are industry representatives) meets a minimum of twice a year, and is charged with providing DEC with its recommendations on developing rules and regulations that could impact the oil and gas industry.

The U.S. Bureau of Land Management has regulatory authority for oil and gas activities when mineral rights are Federally held. The Bureau's regulations are discussed in a separate section, Federal Agencies. (See Volume 1, Chapter VII).

The U.S. Forest Service has jurisdiction over surface activities on Federal forest lands even when mineral rights are held privately.

The Water Quality Division, Fish and Wildlife Division, and the Regulatory Affairs, Law Enforcement, and Lands and Forests Divisions, provide instrumental manpower and enforcement actions, when applicable.

STATE RULES AND REGULATIONS

Drilling

The Division of Mineral Resources in the Department of Environmental Conservation issues all oil and gas drilling permits. The Mineral Resources Regulations establish a general objective that must be incorporated in all permits: "Pollution of the land and/or of surface or ground fresh water resulting from exploration or drilling is prohibited." Each permit requires that the fluids generated by drilling be "hauled away and properly disposed of." The regulations do not provide specific guidance regarding what practices constitute proper disposal. Rather, the operator must submit and receive approval of a plan for the "environmentally safe and proper ultimate disposal of such fluids."

If drilling muds are freshwater natural clay-based muds, they are considered nonpolluting and are specifically excluded from this requirement. Muds contaminated with oil or other pollutants must be disposed of in a certified landfill. Drilling pits are dewatered and the fluids are disposed of properly prior to reclamation. During reclamation, pit liners are either shredded or folded over the remaining rock cuttings and residue before in situ burial.

Other drilling wastes must be disposed of or discharged in a manner acceptable to the Department considering the environmental sensitivity and geology of the area. Historical experience with drilling operations in the same area may also be used in considering an application. In addition to the drilling permit, permits may be required for disposal or discharge of drilling wastes (excluding drilling muds).

Since 1982 DEC has required that all drilling pits be properly constructed, sized, and lined. It is a permit condition on all wells. The only exception has been the closely observed, pitless drilling experiments associated with some air-drilled wells.

DEC has noted that most of the wells in New York are drilled with air, and there is very little fluid associated with the drill cuttings in the drill pit. As a result, there has been some experimentation with pitless drilling, which DEC reports "creates a temporary dust problem and some vegetation is killed by the associated brine, but less than would be killed by clearing the land for a drilling pit."

Produced waters generated during drilling are considered "polluting fluids" in the Mineral Resources Regulations. These and other polluting fluids may be stored in watertight tanks or lined pits for up to 45 days after drilling ends prior to disposal. An extension may be granted if the operator plans to use the fluids for later activities. The disposal alternatives for produced waters generated during drilling would generally to be same as those for waters generated during production.

The Department is also responsible for well construction and spacing requirements.

Produced Water

Parts 554 and 556 of the DEC regulations address drilling and operating practices applicable to oil and gas wells. Section 554.1(b) specifically prohibits pollution resulting from exploration and drilling. Section 556.5 prohibits pollution of the land and/or surface or ground fresh water resulting from producing, refining, transportation, or processing of oil, gas, and products. Brine (i.e., produced water) may be stored in watertight tanks or in lined pits prior to disposition. Although specific construction requirements are not described in the regulation, pits must be constructed and lined to prevent percolation into the soil, or over or into adjacent lands, streams, or bodies of water.

The only disposal alternative described in the regulation is injection. The Department of Environmental Conservation has procedures for application and approval of permits to inject produced waters; since New York does not have primacy for the UIC program, an operator would have to obtain a permit from EPA Region II as well.

According to DEC, the predominant method of disposing of the dilute produced waters associated with oil production in the old waterflooded fields of New York is under NPDES permits. Roadspreading is the principal produced water disposal method for the concentrated brines associated with the State's gas wells. Roadspreading is conducted on a manifest system under a separate permit. Criteria for roadspreading are established on a case-by-case basis and include such requirements as time of day, use of spreading bar, prohibition on spreading during rainstorms, and concentration limits.

The Department of Environmental Conservation allows "processing [of brines] at sewage disposal plants, permitted onsite discharges, and hauling to other States with approved disposal facilities." DEC allows produced water discharges from stripper wells under permits with the following limitations:

Oil and grease	15 mg/L
pH	6 to 9
Benzene	10 micrograms/L
Toluene	10 micrograms/L
Xylene	10 micrograms/L.

Sampling is done infrequently on any given well. Annular disposal is not allowed.

Offsite Disposal

New York regulations do not address the use of offsite pits for long-term storage or disposal.

Plugging/Abandonment

Wells that are commercially producible may be shut in for 1 year, and may be granted additional 1-year extensions (renewable) for good cause. Wells may be temporarily abandoned for only 90 days without specific permission, but extensions for a "reasonable time period" will be granted and renewed for good cause.

The operator must obtain a plugging permit from the DMN prior to commencing plugging operations. The wellbore must be filled with cement from the bottom of the well to 15 feet above the shallowest formation from which production was ever obtained in the vicinity. Alternatively, a bridge topped with 15 feet of cement may be placed above each formation from which production was ever obtained. If the casing is left in the well, 15-foot plugs must be placed at the top and bottom. If the casing extending below the deepest potable water is not to remain, a 15-foot plug must be placed 50 feet below that water level. If the surface casing is withdrawn, a 15-foot plug should be placed immediately below where the lower end of the casing rested, and the well should be filled with cement from that point to the top. Intervals between plugs must be filled with heavy, mud-laden fluid. If the casing left in the hole was never cemented, it must be perforaed and cement-squeezed into the annular space. Additional requirements to ensure proper abandonment are added by permit condition.

More stringent regulations were proposed in the Draft Generic Environmental Impact Statement published in January 1988 and are expected to be incorporated into an upcoming revision of the regulations. Some of the more stringent requirements are currently implemented as standard permit conditions.

References

Cornell University. Oil, Gas and Solution Mining Legislation in New York As Amended through September 1985.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Volume XLIV, No. 2, December 1985.

New York State Environmental Conservation Law, Article 23, Title 1-5 (circa 1985).

New York State Statute 550.2, Subchapter B - Mineral Resources, Parts 550 through 558, as amended.

USEPA. 1985. U.S. Environmental Protection Agency. New York Meeting Report. Proceedings of the Onshore Oil and Gas Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: North Carolina

Forms completed by: Charles W. Hoffman

Agency: North Carolina Geological Survey
Phone: (919) 733-7353

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DLR
DSWM
DEM

Off-site disposal: DLR
DSWM

(DLR - Division of Land Resources)
(DSWM - Division of Solid Waste Management)
(DEM - Division of Environmental Management)

Note: These three divisions are within the Department of Environment, Health and Natural Resources.

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

DLR permits exploration and production drilling, so they would lilely take the lead role and provide information about drilling activities to other agencies.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

No monies or staff specifically identified for oil and gas regulation.

1. Enforcement, field monitoring and inspection;

2. Legal support;

3. Permitting, siting, and administration; and

Please indicate, for each agency above, what type of training is needed for your staff.

No training specific to oil and gas regulation.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DEM	DEM
b.	Roadspreading	DSWM	DSWM
c.	Pits	DSWM	DSWM
d.	Surface water disposal	DSWM	DSWM
e.	Waste haulers	DSWM	DSWM
f.	Burial or landfill	DSWM	DSWM
g.	Disposal wells	DEM	DEM
h.	Enhanced oil recovery injection wells	DEM - DLR	DEM - DLR

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DEM	DEM
b.	Clean Water Act (NPDES)	DEM	DEM
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DSWM	DSWM
	Subpart D (Non-Hazardous)	DSWM	DSWM

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Drilling permit requires $5,000.00 bond for exploration hole.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

For all agencies, either administrative proceedings (through administrative hearings) or court procedures (through attorney general) may be initiated by the regulatory agencies. No specific policies in place for oil and gas waste disposal.

Please list the types of enforcement actions available?

Injunction, civil and criminal court actions, and administrative fines.

STATE: North Dakota

AGENCIES: Industrial Commission
* Oil and Gas Division (OGD)
Health Department (HD)
Public Service Commission

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Not allowed off-site.
Roadspreading - Not allowed.
Pits - (OGD) - Reserve pits authorized with location restrictions. Liners not always required. Must be restored within 1 year after completion of drilling. Off-site disposal pits not allowed.
Surface water discharge - (OGD-HD) - Produced water discharges authorized by NPDES permits.
Waste haulers - (OGD-HD) -
Burial or landfill - (OGD-HD) -
EOR/injection wells - (OGD) - Delegated Class II program. Most produced water is disposed through injection.

BONDING: Compliance bond required. Bond conditioned upon full compliance with the laws and rules and regulations of the Commission. Bond amount is $15,000 per well (certain exceptions). Blanket bonds are $50,000 for ten or less wells or $100,000 for more than ten wells.

ENFORCEMENT: Options available to the Oil and Gas Division include cessation of operations and assessment of fines up to $12,500/day. The Health Department can take administrative actions and seek penalties through judicial action.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: North Dakota

Forms completed by: Charles A. Koch

Agency: North Dakota Industrial Commission (NDIC), Oil & Gas Division
Phone: (701) 224-2969

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: NDIC, Oil & Gas Division

Off-site disposal: NDIC, Oil & Gas Division
Public Service Commission
Health Department (HD)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The North Dakota Industrial Commission, Oil and Gas Division is the lead agency. There has been a grey area concerning the hauling of brine by truckers as to who has the authority to prevent any trucker from hauling brine. The 1989 Legislators passed a law declaring brine as garbage and thus authorizing the Public Service Commission to license all brine haulers. There is no agreement between the two agencies but now we can recommend to the Public Service Commission to suspend a license in cases where violations occur.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   14 - This number only includes our field offices where field monitoring and inspections take place. Enforcement is a function of both the field offices and the Bismarck office. ($275,020)

2. Legal support; and

   2 - Our legal staff is shared with other agencies and also assist in items 1 and 3.

3. Permitting, siting, and administration.

   18 - This only includes our Bismarck staff. Siting is done by the field offices ($1,024,639)

Please indicate, for each agency above, what type of training is needed for your staff.

1. Field inspectors must either have a number of years in oil field experience or a degree in geology or a related field of education.

2. The legal staff must have a law degree and have passed the state bar examination.

3. The administrators and staff have degrees in either petroleum engineering or geology.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
_X_ yes ___ no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	Does not exist	Does not exist
b.	Roadspreading	Not allowed	Not allowed
c.	Pits	NDIC, Oil & Gas Division	NDIC, Oil & Gas Division
d.	Surface water disposal	NDIC, Oil & Gas Division	HD, NDIC, Oil & Gas Division
e.	Waste haulers	NDIC, Oil & Gas Division	HD, NDIC, Oil & Gas Division
f.	Burial or landfill	NDIC, Oil & Gas Division	HD
g.	Disposal wells	NDIC, Oil & Gas Division	NDIC, Oil & Gas Division
h.	Enhanced oil recovery injection wells	NDIC, Oil & Gas Division	NDIC, Oil & Gas Division

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	NDIC, Oil & Gas Division	NDIC, Oil & Gas Division
b.	Clean Water Act (NPDES)	HD	HD
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	HD	HD
	Subpart D (Non-Hazardous)	HD	HD

3. List any financial assurance requirements for oil and gas exploration and production wastes:

In order to drill wells in North Dakota, the operator must be bonded by either a surety bond or a cash bond. The bond amounts are as follows: 1 well bond $15,000; 10 well bond $50,000; and a blanket bond (limited to 10 dry holes) $100,000. The bonds are not released until a site is reclaimed and the reclamation is approved by the Bismarck office.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The Health Department can begin enforcement actions through administrative proceedings but penalties are imposed by judicial action. There is no overlap in authority, therefore an agreement is not required.

Please list the types of enforcement actions available?

The Oil & Gas Division has the authority to shut down any operation for violations of its rules or statutes. In addition, the Division can fine an operator up to $12,500 a day with eah day being a separate violation but a hearing is required.

The Health Department can impose penalties under the water pollution control law and the solid waste disposal law. Willful violations of the water pollution control law can result in penalties up to $25,000 per day and/or imprisonment for not more than a year. Other water pollution violations are subject to penalties up to $10,000 per day. Violations of the solid waste disposal law can result in penaltie of up to $300 per day.

NORTH DAKOTA

INTRODUCTION

North Dakota produced 45,624,000 barrels of oil and 62 x 10^9 cubic feet of gas in 1986. Production was from 3,595 oil wells and 103 gas wells.

REGULATORY AGENCIES

The following three agencies regulate oil and gas activity in North Dakota:

* North Dakota Industrial Commission, Oil and Gas Division;
* U.S. Department of Agriculture, Forest Service; and
* U.S. Bureau of Land Management.

The North Dakota Industrial Commission, Oil and Gas Division, has the regulatory responsibility to oversee the drilling and production of oil, protect the correlative rights of the mineral owners, prevent waste, and protect all sources of drinking water. Other responsibilities of the Division are to collect monthly reports on oil, gas, and water; oversee proper disposal of produced water; and issue drilling permits. The Division also has primacy for UIC Class II wells and issues such permits.

The Bureau of Land Management has jurisdiction over drilling and production on Federal lands, but the operator must obtain a permit from the Oil and Gas Division. When drilling is to occur on U.S. forestland, the operator must obtain a State permit and meet additional stipulations required by the U.S. Forest Service.

STATE RULES AND REGULATIONS

Drilling

Before a drilling permit is issued by the Commission, the operator of the well must be bonded. Single well bonds are $15,000, a 10-well bond is $50,000, and a blanket bond is $100,000. The Commission will release the bond after site restoration is approved. Before drilling activities get underway, Commission inspectors will survey the site for pit location. The inspectors also decide whether or not to require a pit liner at the site.

Under Commission Rule 43-02-03-19, "Pits shall not be located in or hazardously near, stream courses, nor shall they block natural drainages. Pits shall be constructed in such a manner as to prevent contamination of surface or subsurface waters by seepage or flowage therefrom. Under no circumstances shall pits be used for disposal, dumping or storage of fluids, wastes and other debris not used in drilling operation." Within 1 year after the completion of a well, the pit site must be restored. Pit restoration does require approval from the Commission. Reclamation includes removing the fluid from the pit and redistributing the topsoil that was removed from the site at the start of drilling activities.

When drilling is on U.S. forest lands, the U.S. Forest Service has stipulations in addition to those of the Commission. The Forest Service requires a complete survey and design of the drilling site. This survey must be approved before drilling. All reserve pits must be lined with a material that meets the minimum requirements set by the Forest Service. The reclamation plan must also be approved by the Forest Service before implementation.

Production

Under Commission Rule 43-02-03-53, "All saltwater liquids or brines produced with oil and natural gas shall be disposed of without pollution of freshwater supplies. At no time shall saltwater liquids or brines be allowed to flow over the surface of the land or into streams." Surface pits are not allowed for produced water storage. Surface tanks are allowed provided they are diked and leak-proof.

Produced water may be disposed of by use of injection wells for either enhanced recovery or disposal. When use of a central tank battery or central production facility is planned, approval must be received from the Commission or from the Forest Service if on U.S. forest lands. Both methods require permits issued by the Commission. All injection wells must be cased and cemented to prevent the movement of fluids into or between the underground sources of drinking water. Plans for drilling a well must include an analysis of all other pits within the applicable area of review, the initiation of corrective action, if needed, on other wells penetrating the injection zone, and the evaluation of appropriate pressure to avoid generating or spreading fractures in the confining zone. Mechanical integrity tests must be carried out before injection is initiated and at least every 5 years thereafter (although regular monitoring of the annulus pressure or records showing a consistent relationship between injection pressure and flow rate may be used in lieu of later pressure tests). Wells must be pressure tested for at least 15 minutes. Test pressure is dependent upon maximum injection pressure. Allowed pressure variance depends upon the stabilized test pressure and maximum injection pressure.

Offsite Disposal

The State has several commercial produced water disposal wells but no pits. The produced waters hauled onto commercial facilities are stored in tanks. The State also has three permitted industrial waste landfills for disposal of drilling muds.

Plugging/Abandonment

A well may be temporarily abandoned (generally for economic reasons) and no casing can be pulled without the approval of the enforcement officer. A plug must be placed at the top of the casing. Wells that have been shut in for long periods will be reviewed on a case-by-case basis, including tests of casing integrity. A well in which drilling operations have been suspended for 6 months must be plugged and abandoned unless a permit for temporary abandonment has been obtained.

When wells are plugged, perforations must be squeezed or a cast iron bridge plug must be set above the perforations and capped with five sacks of cement. Cement plugs are set 50 feet in and 50 feet over the top of each productive zone; a 100-foot plug is set half in and half over the Dakota Formation; and a ten-sack plug is set at the surface. If the casing is pulled, 100-foot plugs are placed spanning the casing top and the bottom of the surface casing. Field inspectors must witness every plugging.

References

North Dakota Industrial Commission. 1985. Statutes and rules for the conservation of oil and gas. January 1985.

U.S. Department of Agriculture Special Forest Service stipulations, September 1986.

USEPA. 1985. U.S. Environmental Protection Agency. North Dakota Meeting Report. Proceedings of Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Williams, Tex. State regulatory information submitted in 1985.

STATE: Ohio

AGENCIES: Department of Natural Resources
* Division of Oil and Gas (DOG)
Ohio Environmental Protection Agency (OEPA)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Produced fluid disposal regulated by local governments.

Roadspreading - (DOG) - Off-site produced fluid disposal regulated by local government. State regulates on-site.

Pits - (DOG-OEPA) - Reserve pit construction and closure standards in place, with liner requirements sometimes contained in drilling permits. Storage and disposal pits regulated by permit.

Surface water discharge - NPDES primacy state. No permits issued for E&P wastes.

Waste haulers - (DOG) - Produced water haulers bonded, insured and licensed. Manifest system in place.

Burial or landfill - (DOG-OEPA) - Regulations in place for on-site disposal. Off-site disposal requires EP Toxicity test.

EOR/injection wells - (DOG) - UIC primacy state. Allow annular disposal of production fluids under gravity in producing wells.

BONDING: Compliance bond required. Bond is conditioned on compliance with well plugging and surface restoration requirements. Bond amount is $5,000 per well or $15,000 blanket bond.

ENFORCEMENT: Administrative remedies include notices of violation, notices of material and substantial violations, and orders. Civil and criminal actions are available through the Attorney General.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Ohio

Forms completed by: J. Michael Biddison

Agency: Ohio Department of Natural Resources
Phone: (614) 265-6893

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Ohio Department of Natural Resources/ Division of Oil and Gas

Off-site disposal: Ohio Department of Natural Resources/ Division of Oil and Gas

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

n/a

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

n/a

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

The Division of Oil and Gas operates at $5.30 million annually and has an average of 120 full-time employees as itemized below:

1. Enforcement, field monitoring and inspection;

   35 oil and gas well inspectors; 8 investigators; 8 district supervisors; 4 regional supervisors; 5 UIC inspectors; and 1 UIC field supervisor. In addition, the Division has 1 Enforcement Coordinator.

2. Legal support;

   3 Assistant Attorneys General and 1 General Counsel.

3. Permitting, siting, and administration; and

   There are approximately 60 employees which compile the Division's Central Office/Administrative staff, including 1 Chief and 2 Deputy Chiefs.

Please indicate, for each agency above, what type of training is needed for your staff.

Training is provided in-house and onsite of a technical nature to meet the minimum requirements for an oil and gas well inspector, etc.; in addition, staff is provided with special seminars and biannual workshops.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
_X_ yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	n/a	n/a
b.	Roadspreading	Division of Oil & Gas	Division of Oil & Gas
c.	Pits	Division of Oil & Gas	Ohio EPA
d.	Surface water disposal	n/a	n/a
e.	Waste haulers	Division of Oil & Gas	Division of Oil & Gas
f.	Burial or landfill	Division of Oil & Gas	Ohio EPA
g.	Disposal wells	Division of Oil & Gas	n/a
h.	Enhanced oil recovery injection wells	Division of Oil & Gas	n/a

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	Division of Oil & Gas	n/a
b.	Clean Water Act (NPDES)		Ohio EPA
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)		Ohio EPA
	Subpart D (Non-Hazardous)		Ohio EPA

3. List any financial assurance requirements for oil and gas exploration and production wastes:

$15,000 bond for brine hauler

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Division of Oil and Gas (Division) administrative action includes Notices of Violation, Notices of Material and Substantial Violation, and Orders by the Chief. The Division requests criminal action through the local prosecutor's office and civil actions through the Attorney General's office.

Please list the types of enforcement actions available?

See above.

OHIO

INTRODUCTION

Ohio produced 14,987,592 barrels of oil and 182.2 x 10^9 cubic feet of gas in 1985 from 2,798 full-producing oil wells and approximately 26,412 stripper wells producing less than 10 barrels per day, and 31,343 gas wells, almost all of which were stripper wells producing less than 60,000 cubic feet per day.

REGULATORY AGENCIES

Two agencies regulate oil and gas activity in Ohio:

* Ohio Department of Natural Resources; and
* Ohio Environmental Protection Agency.

The Ohio Department of Natural Resources, Division of Oil and Gas, issues permits for oil and gas drilling and for underground produced water injection. The statutes and rules of the Division of Oil and Gas do not contain provisions for effluent discharges. The Division operates on revenues from permit fees and severance taxes on oil and gas. Enforcement activities are dependent primarily upon about 50 field staff employees who inspect well sites and conduct investigations. The Division of Oil and Gas has authority to review, investigate, and require corrective action related to all oil and gas drilling and production activities. Compliance bonds are required by the Division.

Ohio has been delegated NPDES authority. NPDES permits are issued through the Ohio Environmental Protection Agency, Water Quality Division; none are issued for the oil and gas drilling and production industry. The jurisdiction of the Ohio EPA extends to any pollution of the waters of the State. Where produced water spills may impair waters of the State, for example, the Ohio DNR and the Ohio EPA jointly coordinate damage assessment and corrective measures. When the potential for ground-water contamination exists, the Ohio Environmental Protection Agency may assist in the investigation, and joint charges may be filed with the Ohio Department of Natural Resources.

A five-member oil and gas Board of Review was created by statute within the Ohio Department of Natural Resources. Members of the Board, appointed by the Governor for five-year terms, consist of representatives of a major petroleum company, the public, independent petroleum operators, and individuals experienced in oil and ga law and in geology. Any person claiming to be aggrieved or adversely affected by an order of the Chief of the Division of Oil and Gas may appeal to the Board for an order vacating or modifying such an order.

On occasion, there is oil and gas drilling on Federal lands. When an application for such drilling is filed, the permittee obtains a lease from the appropriate Federal authority prior to requesting a permit from the Division of Oil and Gas. The permitting process then is managed as a standard procedure with no special coordinating efforts.

STATE RULES AND REGULATIONS

Drilling

Earthen pits may be used to contain produced water, drilling muds and cuttings, fracture fluids, or other substances "resulting, obtained or produced in connection with drilling, fracturing, reworking, reconditioning, plugging back, or plugging operations, but such pits shall be constructed to prevent the escape of brine and such substances." There is no requirement for clay or synthetic liners, unless prescribed on a site-specific basis in an area identified as being hydrogeologically sensitive. When a history of ground-water problems is associated with an area, a plastic liner requirement is made part of the drilling permit.

The pits must be emptied and backfilled within 5 months of the commencement of drilling. The regulations specify that "muds, cuttings, and other wastes shall not be disposed of in violation of any rule." In most cases, pit solids are buried on the well site when no environmental harm is expected. Drilling fluids are disposed of by either underground injection or land application.

Produced Waters

Recently enacted laws, which became effective on April 12, 1985, established new standards for well operators and waste produced water transporters. Produced water disposal has been a major environmental issue in Ohio. Well drillers now are required to submit a produced water disposal plan stating the temporary storage method and ultimate disposal method and the site for all produced water.

Operators are required to identify the transporter of the produced water including the transporter's address. Anyone who transports produced water must pay a $500 one-time fee, provide a $300,000 certificate of insurance for bodily injury and liability, post a $15,000 bond to be used in paying for damages, and provide detailed information. This information includes a daily log that identifies the ultimate produced water disposal such as the time and date of produced water loading and the amount, roadspreading location, disposal well permit number, time and date of produced water disposal, etc. The driver must maintain a daily log showing driver name, registration certificate number, sites visited, and destination.

Produced water production is estimated at 40,000 to 50,000 barrels per day. Recent reports indicate that approximately 90 percent of produced water is disposed of through injection wells, 10 percent by surface application an annular disposal.

Storage/Disposal Pits

Under the requirements of the revised rules legislated in April 1985, "no pit or dike shall be used for the ultimate disposal of produced water." Earthen impoundments may be used for the temporary storage of produced water in association with a saltwater injection or enhanced recovery well.

Roadspreading

For roadspreading or landspreading, a county, township, or municipal government must pass a resolution to allow produced water disposal that meets several minimum requirements:

* Prohibitions on produced water application to a water-saturated surface, to vegetation, within 12 feet of bridges or other road surfaces crossing bodies of water or drainage channels, or during the night (except for ice control);

* Regulations on the rate, amount, and methods of application; and

* A prohibition against discharge by the vehicles making the application at any points other than the surfaces specifically approved.

A resolution with these minimum required specifications will be deemed approved when submitted to the Division of Oil and Gas, without any requirement for further review or approval by the Division.

Injection

Ohio has delegated authority for Class II injection. Produced water may be injection into wells for enhanced recovery (170 wells), into disposal wells (182), or into the annulus of a producing well (approximately 4,000 wells). Permits are required for injection into disposal wells or enhanced recovery wells. Notification and approval are required for annular disposal.

For disposal and enhanced recovery wells, surface casing must be set at least 50 feet below the deepest underground source of water containing less than 10,000 mg/L TDS or less than 5,000 mg/L chlorides, and must be cemented to the surface. Surface casing must be cemented to the surface or properly sealed with prepared clay. Injected fluids must be isolated by the use of casing mechanically centralized and enclosed in cement to a height of no less than 300 feet above the top of the injection zone. Injection must be through tubing and a packer set no less than 100 feet above the injection zone.

A variance from some construction requirements may be granted if the injected volume is less than 25 barrels/day at minimal pressures, or if the chief determines that the variance sought will result in the construction of an injection well equivalent in its ability to protect freshwater aquifers.

Prior to any injection, the casing outside the tubing must be pressure tested at 300 psi or at the maximum allowable pressure, whichever is greater, for a period of 15 minutes, with no more than a 5 percent decline in pressure. The mechanical integrity test must be readministered at least once every 5 years.

The maximum volumes that can be disposed of with annular injection are 10 barrels per day (if the surface casing is sealed with cement) or 5 barrels per day (if sealed with prepared clay). Annular disposal can use only the force of gravity. Only salt water and standard well treatment fluids can be disposed of in the annulus. When a well ceases to produce oil or gas, annular disposal must stop and the well must be plugged.

For annular disposal, the surface casing must be sealed with cement or clay and the sealing material circulated to the surface. The surface casing must be set at least 50 feet below the deepest underground source of water with less than 10,000 ppm TDS or 5,000 ppm chloride. Annular disposal systems must be airtight. Produced water can be disposed of by liquid-tight pipeline only at an annular disposal well. No trucking of produced water is permitted.

Mechanical integrity must be demonstrated for annular disposal wells at least once every 5 years, using tracer surveys, noise logs, temperature surveys, or other tests approved by the Division.

Offsite Disposal

When a history of ground-water problems exists, pit solids may have to be removed and transferred to an Ohio EPA-regulated disposal site. If there is a request to move pit solids to an offsite area, an EP-toxicity test for hazardous waste characteristics is required prior to transfer to a State-approved hazardous or nonhazardous landfill, as appropriate. Abandoned pits are investigated when alleged to be the cause of a ground-water problem. If found to contribute to such a problem, the owner of the pit must remove the solids and transport them to a State-approved solids disposal facility.

Plugging/Abandonment

In Ohio, enforcement of plugging regulations is split between two enforcement agencies. Wells plugged in noncoal-bearing townships must be plugged in accordance with rules adopted by the Ohio Division of Oil and Gas, while wells plugged in coal-bearing townships must be plugged in accordance with rules adopted by the Ohio Department of Industrial Relations, Divisions of Mines. Plugging rules adopted by the two agencies differ somewhat.

Any operator plugging a well must inform owners of the land on which the well is sited, owners of adjacent land, and mine owners of the intention to abandon the well. Plugging operations for dry holes must begin as soon as the hole is abandoned. Plugging operations for abandoned production or injection wells must begin "without undue delay after production, extraction, or injection operations have ceased." Temporary abandonment status will be granted for a period of 6 months if the well poses no environmental threat; remedial action must be taken to correct environmental threats before such status will be granted.

Surface casing cannot be pulled from a rotary drilled well. Surface casing can be pulled from a cable tool drilled well if the conductor pipe is left in place. Cement plugs must be placed from a minimum of 50 feet below the base to a minimum of 100 feet above the top of the lowest reservoir rock. If clay is used as the plug, the plug must extend 400 feet above the top of the reservoir. For each succeeding reservoir, until within 100 feet of the bottom of the surface casing, the requirements are identical for cement plugs; for clay plugs the required minimum height above the top of a reservoir is reduced to 200 feet. For freshwater zones, cement plugs must extend from 50 feet below to 100 feet above the zone. A cement plug must also be placed from 50 feet below grade level to 30 inches below grade level. If a clay plug is used, the plug must extend from 50 feet below the base of the freshwater zone to 30 inches below grade. All portions of the well that are not filled by the plugs are to be filled with mud-laden fluid.

After a well is abandoned, the operator must file, with the Division of Oil and Gas, a detailed report containing information about the plugging and the identity of witnesses to the plugging.

References

Chapter 1501, Rules of the Division of Oil and Gas of the Ohio Department of Natural Resources.

Chapter 1509 of the Ohio Revised Code.

Hodges, David H. 1985. Letter communication to EPA. Division of Oil and Gas, Ohio Department of Natural Resources.

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production, June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

USEPA. 1985. U.S. Environmental Protection Agency. Ohio Meeting Report. Proceedings of the Onshore Oil and Gas Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

Ted DeBrosse, DNR, Division of Oil and Gas (614) 265-6894.

David A. Hodges, DNR, Division of Oil and Gas (614) 265-6917.

Dick Schockley, DNR, Division of Oil and Gas (614) 984-2344.

STATE: Oklahoma

AGENCIES: * Oklahoma Corporation Commission (OCC)
Osage Indian Nation (OIN)
U.S. Bureau of Land Management (USBLM)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (OCC) - Standards (restrictions) in place.
Roadspreading - (OCC) -
Pits - (OCC) - Commercial pits regulated by field rules within a defined area. Reserve pits permitted as part of drilling permit. Liners required for certain areas and high chloride and oil-based drilling fluid.
Surface water discharge - (OCC) -
Waste haulers - (OCC) -
Burial or landfill - (OCC) -
EOR/injection wells - (OCC) - Produced water injected.

BONDING: Compliance bond required, which may be in the form of a surety bond, financial statement, letter of credit, certificate of deposit or cash. Bond is conditioned upon proper plugging. ($50,000 for financial statements). The operator may file a blanket surety bond in the principal amount of $25,000. In the alterative, the Operator may file a surety bond of a lessor amount but that is sufficient to cover the total estimated cost of properly plugging and abandoning each and every well, the operations for which the Operator is responsible. Said alternative surety bond shall be increased upward, but not to exceed $25,000, as additional wells are added to the Operators responsibility.

ENFORCEMENT: Enforcement actions initiated through administrative proceedings. Includes shut-down of operations.

COMMENTS: Disposal method for drilling fluid permitted as part of drilling permit.
Record keeping requirements?

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Oklahoma

Forms completed by: C.D. (Jack) Davidson

Agency: Oklahoma Corporation Commission (OCC)
Phone: (405) 521-2302

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: OCC
OIN
USBLM

Off-site disposal: OCC
OIN
USBLM

(OCC - Oklahoma Corporation Commission)
(OIN - Osage Indian Nation)
(USBLM - U.S. Bureau of Land Management)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Each of the above have independent jurisdiction over lands under their control.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   Enforcement and investigation (OCC)
   98 people at a cost of $3,192,000

2. Legal support;

   5 full-time attorneys plus partial support from 3 others at a cost of $450,000

3. Permitting, siting, and administration; and

   52 people at a cost of $1,241,735 (OCC)

Please indicate, for each agency above, what type of training is needed for your staff.

1. Enforcement, field monitoring and inspection: (OCC only)

   Oilfield experienced personnel are hired for these positions then they are schooled in H_2S safety, blowout control, various inhouse courses on communication, management, safety, etc.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	OCC	OCC
b.	Roadspreading	OCC	OCC
c.	Pits	OCC	OCC
d.	Surface water disposal	OCC	OCC
e.	Waste haulers	OCC	OCC
f.	Burial or landfill	OCC	OCC
g.	Disposal wells	OCC	OCC
h.	Enhanced oil recovery injection wells	OCC	OCC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OCC	OCC
b.	Clean Water Act (NPDES)	OCC	OCC
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	OK Dept. of Health	
	Subpart D (Non-Hazardous)		

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Surety Requirements:

1. Agreement with Oklahoma Corporation Commission:

   Any operator of a commercial pit shall file with the Manager of Document Handling for the Oil and Gas Conservation Division an agreement to properly close and reclaim the site in accordance with approved closure and reclamation procedures upon termination of disposal operations due to abandonment, shutdown, full pits, or other reason. The agreement shall be on forms available from the Conservation Division and shall be accompanied by surety. The agreement shall be on forms available from the Conservation Division and shall be accompanied by surety. The agreement shall provide that if the Commission finds that the operator has failed or refused to close the pits or take remedial action as required by law and the rules of the Commission, then the surety shall pay to the Commission the full amount of the operator's obligation up to the limit of the surety.

2. Surety Amount and Type:

   The Commission shall establish the amount of security in the order for the authority to construct or enlarge a commercial pit. The amount of security shall be based on factors such as dimensions of the pit, and costs of hauling, closure, reclamation, and monitoring. The amount may be subject to change for good cause. The security shall be maintained for as long as monitoring is required. The type of security shall be a corporate surety bond, certificate of deposit, irrevocable letter of credit, or other type of security approved for the pit by order of the Commission. Any type of surety that expires shall be renewed prior to 30 days before the expiration date. All joint escrow accounts shall be made current every 60 days.

Drilling and Development

1. Operators Agreement, Financial Statement, Blanket Surety Bond, Irrevocable Letter of Credit or Transfer of Ownership of Well

   A. Any person who drills or operates any well for the exploration, development or production of oil or gas, or as an injection or disposal well, within this state, shall furnish in writing, on forms approved by the Corporation Commission, his agreement to drill, operate and plug wells in compliance with the rules and regulations fo the Commission, together with evidence of financial ability to comply with the requirements for plugging, closure of surface impoundments, removal of trash and equipment as established by the rules and regulations of the Commission and by law. To establish evidence of financial ability, the Commission shall require:

      1. Category A surety which shall include a financial staement listing assets and liabilities and including a general release that the information may be verified with banks and other financial institutions. The statement shall prove a net worth of not less than Fifth Thousand Dollars ($50,000.00); or

      2. Category B surety which shall include an irrevocable commercial letter of credit in an amount of Twenty-five Thousand Dollars ($25,000.00); or a blanket surety bond or cash, a cashier's check, a Certificate of Deposit, Bank Joint Custody Receipt, or other negotiable instrument. The amount of such letter of credit, cash, check, certificate, bond, receipt or other negotiable instrument shall be at least Twenty-five Thousand Dollars ($25,000.00). The Commission is authorized to determine the amount of Category B surety based upon the past performance of the person regarding compliance with the laws of this state, and any rules and regulations promulgated thereto, including but not limited to the drilling, operation and plugging of wells, closure of surface impoundments or removal of trash and equipment. Any instrument shall constitute an unconditional promise to pay and be in a form negotiable by the Commission.

   B. Operators of record as of the effective date of this act who do not have any outstanding contempt citations or fines may post Category A survey.

      New operators or operators who have outstanding fines or contempt citations as of the effective date of this act shall be required to post Category B surety. Operators who have posted Category B surety and have operated under this type surety and have no outstanding fines at the end of three (3) years may post Category A surety.

      Operators using Category A surety who are assessed a fine of Two Thousand Dollars ($2,000.00) or more and who do not pay the fine within the specified time shall be required to post a Category B surety within thirty (30) days of notification by the Commission.

   C. If a bond is required, the bond shall be executed by a corporate surety authorized to do business in this State and shall be renewed and continued in effect until the conditions have been met or release of the bond is authorized by the Commission.

   D. Irrespective of the pending subsections, for good cause shown, concerning pollution or improper plugging of wells, the Commission, upon application of the Director of the Oil and Gas Division, after notice and hearing, may require the filing of a Category B surety in an amount greater than Twenty-five Thousand Dollars ($25,000.00) but not to exceed One Hundred Thousand Dollars ($100,000.00).

   E. The agreement provided for in subsection (a) of this section shall provide that if the Commission determines, after notice and hearing, that the person furnished the agreement has neglected, failed, or refused to plug and abandon, or cause to be plugged and abandoned, or replug any well or has neglected, failed or refused to close any surface impoundment or remove or cause to be removed trash and equipment in compliance with the Rules and Regulations of the Commission, then the person shall forfeit from his bond, letter of credit, or negotiable

instrument or shall pay to this State, through the Commission, for deposit in the State Treasury, a sum equal to the cost of plugging the well, closure of any surface impoundment or removal of trash and equipment. The Commission may cause the remedial work to be done, issuing a warrant in payment of the cost thereof drawn against the monies accruing in the State Treasury from the forfeiture or payment. The Commission shall also recover any costs arising from litigation to enforce this provision if the Commission prevails. Provided, before a person is required to forfeit or pay any monies to the State pursuant to this Rule, the Commission shall notify the person at his last-known address of the determination of neglect, failure or refusal to plug or replug any well, or close any surface impoundment or remove trash and equipment and said person shall have ten (10) days from the date of notification within which to commence remedial operations. Failure to commence remedial operations shall result in forfeiture or payment as provided in this Rule.

F. No person shall operate any well, or receive an allowable, without complying with the provisions of this rule.

G. The Commission may order the wells of operators shut-in for non-compliance with this rule after hearing upon a Complaint filed by the Director of Conservation, with or without notice as the Commission may direct. No taker, transporter, or purchasers of oil or gas shall take, transport, of purchase oil or gas from the wells of any such drillers or operators after receiving a copy of the shut-in order or notice by certified mail of the issuance of such an order.

Financial Statement

A. The plugging agreement shall be accompanied by security. The security requirement may be met by furnished the Operator's current Financial Statement which shall be a full statement of his assets and liabilities and shall reflect his total net worth of not less than Fifty Thousand Dollars ($50,000.00) located in this State.

B. The value of producing oil and gas leaseholds for which the Financial Statement stands as security will be deducted from total net worth unless the Financial Statement is accompanied by the written appraisal of a recognized independent appraiser of oil and gas properties showing the fair market of the leasehold interet owned by the operator.

C. The Director of Conservation may require proof in the form of an appraisal or other proof of the fair market value of any asset listed in the Financial Statement, and the Director of Conservation may also require proof that the Financial Statement truly shows the net fair market value of all assets over and above all debts and encumbrances.

D. A current Financial Statement shall be filed annually on Form 1006A.

Corporate Surety Bond

A. The operator may file a Blanket Surety Bond in the principal amount of Twenty-five Thousand Dollars ($25,000.00) on form 1006 as security.

B. For purposes of paragraph (a) of this rule, an operator may file a surety bond issued by a corporation authorized to issue such bonds in the State of Oklahoma.

C. The Conservation Division shall not accept a bond unless the surety agrees to give the Conservation Division six (6) months written notice before cancellation of a bond prior to expiration of the bond and evidence furnished of acceptable alternate surety is required.

Irrevocable Commercial Letter of Credit

A. At his option, the operator may file an Irrevocable Commercial Letter of Credit of a Bank in the sum of $25,000.00 on form 1006C as security.

B. The Letter of Credit shall be for a term of not less than one year.

C. The Bank issuing the Letter of Credit shall endorse thereon that the Letter of Credit shall remain in effect until cancelled or revoked by the Bank or principal/operator upon six months notice in writing to the Conservation Division and evidence furnished of acceptable alternate surety if required.

Cashier's Check, Certificate of Deposit, or Other Negotiable Instrument

A. The operator may deposit cash, a cashier's check, a certificate of deposit, bank joint custody receipt, or other negotiable instrument in the amount of $25,000.00 as security. However, any instrument must constitute an unconditional promise to pay and be in a form negotiable by the Commission.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

OCC initiates enforcement action through administrative proceedings.

Please list the types of enforcement actions available?

Shut down of operations
Fines

OKLAHOMA

INTRODUCTION

Oklahoma produced 153,250,000 barrels of oil and 1.996×10^9 cubic feet of gas in 1984. It ranked fifth in U.S. oil production and third in U.S. gas production. Oklahoma had 99,030 producing oil wells and 23,647 producing gas wells. Approximately 200 million barrels of salt water are produced by the oil industry per year. There are about 7,900 saltwater disposal wells and 14,900 enhanced recovery injection wells. About 200 of the disposal wells are commercial facilities.

REGULATORY AGENCIES

Three agencies regulate oil and gas activities in Oklahoma:

* Oklahoma Corporation Commission, Oil and Gas Conservation Division;
* Osage Indian Tribe (in Osage County); and
* U.S. Bureau of Land Management.

The Oklahoma Corporation Commission, Oil and Gas Conservation Division, has exclusive jurisdiction over all laws and regulations "relating to the conservation of oil and gas and the prevention of pollution in connection with the exploration, drilling, producing, transporting, purchasing, processing and storage of oil and gas..." Pollution of surface or subsurface water during any well activity is prohibited. Currently, 55 inspectors have the authority to shut down operations if regulations are not followed. Oklahoma has received primacy for the UIC program, and the Division is responsible for the permitting and regulation of Class II wells.

The Osage Indian Tribe has sole primacy regarding oil and gas operations in Osage County. The UIC program of Class II wells is directly implemented by EPA.

The U.S. Bureau of Land Management has primacy where both surface and mineral rights are owned by the Bureau or by an Indian tribe other than the Osage Tribe. In those case where the mineral rights, but not the surface rights, are owned by the Bureau of or an Indian tribe, both the Bureau and the Oklahoma Corporation Commission would become involved and would coordinate the permitting procedures.

STATE RULES AND REGULATIONS

Drilling

Reserve Pit Construction

When an intent to drill is submitted, an operator must declare what type of pit system and mud system will be used, and the average chlorides that are anticipated. If an open pit is to be used, either on-site or off-site, the Technical Department of the Commission will determine whether or not a pit can be located at the site and whether or not the pit must be lined. The basis for this determination comes from Oklahoma Geological Survey maps and the county soil survey.

If the pit is to be located over a hydrologically sensitive area (HSA, and is to contain water-based mud with chlorides averaging greater than 5,000 mg/l, it must be lined with a minimum 20-mil geomembrane or a soil liner meeting a 1.0×10^{-6} cm/sec permeability limitation. If an oil-based mud system is to be used, the pit must be lined with a minimum 30-mil geomembrance regardless of other factors. For a completion/fracture/workover pit that is located over a HSA and is to contain chlorides in excess of 5,000 mg/l, a minimum 30-mil geomembrane must be used. No liner is required in other situations.

Pit Closure

Reserve/circulation pits must be closed and reclaimed within 12 months of the end of drilling operations, unless the pit was required to be lined, in which case it must be closed and reclaimed within 6 months. Lined pits may not be trenched, but must be encapsulated using a minimum 12-mil geomembrane cap. A minimum of three feet of soil cover is required over the contents of unlined pits or over the cap of lined pits.

A completion/fracture/workover pit must be closed within 30 days after those operations are completed. An emergency pit must be emptied and closed within 60 days of the cessation of the emergency. A flare pit must be closed within 30 days of the abandonment of a lease and a basic sediment pit within 60 days after use ceases.

Disposal

Four methods are normally used to dispose of drilling fluids; annular injection, evaporation followed by burial of pit solids, one-time land application of fluids, or vacuum truck removal to commercial pits or soil farming sites. The method of disposal must be designated on the intent to drill.

Land application is not allowed unless receiving soils are suitable and the hydrology will not lead to pollution of surface or ground waters.

Specifically, land application is prohibited where:

* The land has a slope greater than 8 percent;
* The depth to bedrock is less than 20 inches;
* Floods occur more often than once every 2 years;
* The soil lacks 12 inches of loan, clay, or silt;
* Any of the soil is severly saline (>8,000 micromhos/cm); and
* A water table is within 6 feet of the soil surface.

When land application is permitted, it must be at least 100 feet away from freshwater ponds or lakes, and streams designated by Oklahoma Water Quality Standards; at least 50 feet from property line boundaries and non-designated streams; 300 feet from any domestic or irrigation water well; and 800 feet from any active municipal water well.

The maximum application rate for land application is determined by the most limiting of the following parameters;

Total dry weight of applied materials	200,000 lbs/acre
Total soluble salts	6,000 lbs/acre (less TSS in soil)
Oil and Grease	40,000 lbs/acre

Runoff of land applied materials prior to incorporation is prohibited. Land application may not be practiced in high winds, immediately before, during, or after rains, when the ground is frozen, or when the ground is too highly saturated.

Produced Waters

Injection

Produced waters are injected underground for both enhanced recovery (14,900 wells) and disposal (7,700 onsite and 200 commercial wells). Permits required from the Commission for all such wells, whether new or converted.

Neither enhanced recovery injection wells nor disposal wells are permitted within one-half mile of an active or reserve municipal water supply well unless the applicant can "prove by substantial evidence" that the injection well will not pollute the municipal water supply. In addition, the applicant is required to provide information on the present status of all active or abandoned wells within one-half mile of the enhanced recovery or disposal well, and to identify any abandoned wells that were improperly plugged or remain unplugged.

Wells must be constructed and operated to confine injection fluids to the approved intervals and to prevent pollution of fresh water or damage to oil or gas resources. Surface casing or a stage collar must be installed to at least 90 feet below the surface or 50 feet below any treatable water strata, whichever is lower, and the annular space behind the casing must be filled with cement from the base of the surface casing or stage collar to the surface. (Alternative casing and cementing methods are permissible under some circumstances.)

Substances must be injected or disposed of through tubing and packer. Adequate aboveground extensions should be installed in each annulus in the well. Appropriate fittings must be provided to allow for measurement of injection pressure.

Before wells for disposal or enhanced recovery can be operated, they must be pressure tested under the supervision of the Conservation Division. For newly permitted wells, the casing outside the tubing must be tested at the maximum authorized injection pressure or 300 psi, whichever is greater; however, the test is not to exceed 1,000 psi. For commercial wells, the test is 1,000 psi, or the maximum authorized injection pressure, whichever is greater.

With the exception of operators who elect to monitor their wells, each disposal or enhanced recovery well must be pressure tested at least once every 5 years. The casing tubing annulus above the packer must be tested at a minimum of 200 psi. In lieu of such a casing pressure test, the operator may, each month, monitor and record the pressure in the casing-tubing annulus during actual injection, and report the pressure annually (Rules 3-206, 3-301 through 3-309, 8-8).

Offsite Disposal

Under Rule 3-110.2, the Oklahoma Corporation Commission permits the use of commercial pits. Such pits must be constructed or sealed with an impervious material, and must be operated in such a way as to prevent the escape of any deleterious materials. The operator must provide a bond or irrevocable letter of credit as guarantee that the pit will be emptied and leveled upon termination of disposal activities.

There have been approximately 105 commercial pits constructed throughout Oklahoma, ranging from less than an acre to about 10 acres in size. Some commercial pits may contain over 3,000,000 barrels of waste, which calculates to 387 acre/feet of fluids.

For any commercial pit, a qualified engineer must prepare a plan for construction, and closure. Commercial pits must have a soil seal at least 18 inches thick, with permeability no greater than 10^{-7} cm/sec. The pit must not receive fluids with a chloride content greater than 3,500 ppm (5,000 for new pits), and may not contain fluids in excess of 5,000 ppm chlories (10,000 for new pits). The pit cannot be built in a 100-year flood plain, must be built to prevent incursion of outside water runoff, and must be managed to maintain the surface fluid level 36 vertical inches below the lowest point of the embankment. Such pits must be filled and leveled within 1 year abandonment.

Commercial Soil Farming

Commercial soil farming is permitted, provided the operator has obtained a Commission Order to soil farm a specific tract, and receives a permit for each application of waste. Most of the requirements for commercial soil farming are the same as those for one-time land application of fluids, but some are more stringent. The least vertical distance to ground water for a commercial operation, for example, must be 25 feet; for land application, only 6 feet is required. Monitoring wells are required and surety must be posted with the Commission in the amount of $10,000 for every 40 acres. Operationally speaking, the main difference is that multiple applications can be made to the same tract. The maximum application rates for commercial landfarming are:

Total dry weight of applied material	200,000 lbs/acre
Total soluble salts	6,000 lbs/acre (less TSS in soil)
Arsenic	80 lbs/acre
Chromium	40 lbs/acre
Oil and Grease	40,000 lbs/acre

Plugging/Abandonment

Wells in which neither surface nor production casing has been run must be plugged within 72 hours after drilling or testing is completed. If only surface casing has been run and cemented, plugging must take place within 90 days. In either case, however, if there is any risk of contaminating the environment, oil or gas formations, or treatable water strata, the well must be plugged within 24 hours.

Where production casing has been run, a well must be plugged within 1 year after the cessation of drilling (if not completed or tested), after the cessation of the later of completion or testing (if no production), or after the cessation of production. There are, however, numerous exemptions from this requirement. Exemptions include shut-in gas wells, wells for which the Commission has issued an exemption to plugging requirements (e.g., where production has ceased for economic reasons), and wells located on leases on which other wells are still producing (if they have been granted a Temporary Exemption by the Commission). Operators of stripper wells may plug a well temporarily for up to 2 years.

Plugging must provide for sealing off each productive formation from the wellbore above and below the formation. Cement plugs must extend from 50 feet below to 50 feet above the base of each formation, and from 50 feet below to 50 feet above the top of each formation. Exceptions to these requirements may be granted if: (a) the formation is already sealed off from the wellbore with adequate casing, and (b) the only openings from the productive formation are perforations in the casing, and the annulus between the casing and the outer walls of the well is filled with cement 50 feet below the base and 50 feet above the top of the formation. In such a situation, a bridge plug capped with 10 feet of cement set at the top of the producing formation is authorized.

All freshwater strata in the well must be sealed off by adequate casing from 50 feet below the base of the lowest freshwater stratum to 3 feet from the top of the wellbore, and by completely filling the annular space behind the casing with cement. If surface or other casing meets the requirements, a cement plug may be set 50 feet below the base of the lowest freshwater stratum to 50 feet above the shoe of the surface pipe. The top 30 feet of the wellbore below 3 feet from the surface must be filled with cement. The surface pipe must be cut off 3 feet from the surface and capped with a steel plate.

Any uncased hole below the shoe of any casing to be left in the well should be filled with cement to a depth of at least 50 feet below the shoe of the casing, or the bottom of the hole, and the casing above the shoe should be filled with cement to at least 50 feet above the shoe of the casing. If the well is completed with a screen or liner, and the screen or liner is not removed, the wellbore must be filled with cement from the base of the screen or liner to at least 50 feet above the top of the screen or liner.

All intervals between cement plugs in the wellbore must be filled with mud of not less than 9 lb/gal and not less than 36 viscosity.

All plugging operations must be conducted under the supervision of an authorized representative of the Conservation Division.

References

The Corporation Commission of the State of Oklahoma. 1986. General Rules and Regulations of the Oil and Gas Conservation Division.

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Oklahoma Drilling Waste Conference.

USEPA. 1985. U.S. Environmental Protection Agency. Oklahoma Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop (March 26-27 in Atlanta, Ga.). Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

Tim Baker, Manager of Pollution Abatement, Oklahoma Corporation Commission (405) 521-2242.

Karen Dihrberg, Geologist, Water Resources Board (405) 271-2549.

Margaret Graham, Permits, Water Resources Board (405) 271-2561.

Bob Thomas, Water Resources Board (405) 271-2541.

STATE: Oregon

AGENCIES: * Department of Environmental Quality (DEQ)
Department of Geology and Mineral Industries (DGMI)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DEQ) - In 1988, about 2,500 barrels of production fluids were disposed by surface land disposal.

Roadspreading - (DEQ) - Production fluids are permitted to be spread on dirt roads (predominantly logging roads) in dry weather.

Pits - (DEQ-DGMI) - Reserve pits must be closed before winter. Drilling muds must be disposed of in a DEQ-approved solid waste disposal site. Prior testing of solids is required.

Surface water discharge - (DEQ) - None have been requested.

Waste haulers -

Burial or landfill - (DEQ) -

EOR/injection wells - (DEQ-DGMI) - There is one injection well for the field, which received 34,000 barrels of produced water in 1988.

BONDING: Compliance bond required. Bond is conditioned on compliance with the rules and regulations. Bond amount is $10,000 to $25,000 per well, depending on depth, or a $150,000 blanket bond.

ENFORCEMENT: Enforcement is through administrative actions taken by the Director. These include assessment of civil penalties and the initiation of criminal prosecutions.

COMMENTS: Oregon does not produce oil. In 1988, there were 14 active gas wells which produced 4 bcf of gas.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Oregon

Forms completed by: (name not listed)

Agency: Oregon Department of Geology and Mineral Industries (DGMI)
Phone: (503) 229-5580

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: Dept. of Environmental Quality (DEQ)

Off-site disposal: Dept. of Environmental Quality (DEQ)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

n/a

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

n/a

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   Small fraction of 1 FTE

2. Legal support;

   Small fraction of 1 FTE

3. Permitting, siting, and administration; and

   Small fraction of 1 FTE

Please indicate, for each agency above, what type of training is needed for your staff.

None

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes ___no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DEQ	DEQ
b.	Roadspreading	DEQ	DEQ
c.	Pits	DEQ & DGMI	DEQ
d.	Surface water disposal	DEQ	DEQ
e.	Waste haulers	---	---
f.	Burial or landfill	DEQ	DEQ
g.	Disposal wells	DEQ	DEQ
h.	Enhanced oil recovery injection wells	DEQ & DGMI	DEQ

(DEQ - Department of Environmental Quality)
(DGMI - Department of Geology and Mineral Industries)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DEQ	DEQ
b.	Clean Water Act (NPDES)	DEQ	DEQ
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DEQ	DEQ
	Subpart D (Non-Hazardous)	DEQ	DEQ

3. List any financial assurance requirements for oil and gas exploration and production wastes:

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

DEQ - Enforcement primarily administrative by Director

Please list the types of enforcement actions available?

Civil penalties
Criminal Prosecution

OREGON

INTRODUCTION

Oregon does not produce oil. Oregon's only producing gas field was discovered in 1979. Fourteen active gas wells produced 4.0×10^9 cubic feet of gas in 1988. There is one saltwater injection well for the field. In 1988, approximately 34,000 barrels of produced water were injected underground; about 2,500 barrels went to surface land disposal.

REGULATORY AGENCIES

Two agencies regulate oil and gas activity in Oregon:

* Oregon Department of Geology and Mineral Industries; and
* Oregon Department of Environmental Quality.

Oil and gas drilling permits are issued by the Oregon Department of Geology and Mineral Industries. The State Geologist serves as the implementor of rules, orders, and enforcement actions taken by the Department's governing board. The Department is also responsible for regulating Class II wells.

The Oregon Department of Environmental Quality has delegated authority for the NPDES program and issues UIC permits. The State has maintained a permitting program since 1968. No NPDES permits have been issued because there have been no requests to discharge waste to public waters.

None of the gas wells are on Federal lands. If drilling were to take place on Federal lands in the future, there would be two separate permitting actions--one by the U.S. Bureau of Land Management and one by the Oregon Department of Geology and Mineral Industries.

STATE RULES AND REGULATIONS

Drilling

Oregon Administrative Rule 632-10-205 requires a surety bond of up to $25,000 for one well or a blanket bond of $150,000 for more than one well, conditioned upon the faithful compliance by the principal with the rules, regulations, and orders of the Department of Geology and Mineral Industries.

Rule 632-10-140 requires that any fluid necessary to the drilling, production, or other operations by the permittee be discharged or placed in pits and sumps approved by the State Geologist and the State Department of Environmental Quality. The operator must provide pits, sumps, or tanks of adequate capacity and design to retain all materials. In no event should the contents of a pit or sump be allowed to:

1. Contaminate streams, artificial canals or waterways, ground waters, lakes, or rivers; or

2. Adversely affect the environment, persons, plants, fish, and wildlife and their population.

When no longer needed, fluid in pits and sumps must be disposed of in a manner approved by the Department of Environmental Quality. In addition, the sumps must be filled and covered and the premises must be restored to a near natural state. The restoration need not be done if arrangements are made with the surface owner to leave the site suitable for beneficial subsequent use.

Drilling mud pits are not allowed to hold over the winter because of lack of sufficient storage for winter rainfall. If drilling muds dry in the reserve pits before winter arrives, the pit is then closed.

There has been no problem with abandoned pits; the surety bond provides a mechanism to ensure adequate pit closure.

Production

Rules 632-10-192 of the Department of Geology and Mineral Industries provides that brines, or saltwater liquids, may be:

1. Disposed of in pits only when the pit is lined with impervious material and a Water Pollution Control Facility permit has been issued by the Department of Environmental Quality. Earthen pits used for impounding brine or salt water shall be so constructed and maintained as to prevent the escape of fluid.

2. Disposed of by injection into the strata from which they were produced or into other proved saltwater-bearing strata.

3. Disposed of by ocean discharge, which may be permitted if water quality is acceptable and if such discharge is approved by the State Department of Environmental Quality through issuance of an NPDES waste discharge permit.

Produced brines are permitted to be spread on dirt roads--predominantly logging roads--if done in dry weather.

Offsite Disposal

There are no operational offsite pits. One dumpsite has been used as an emergency pit. Operators must dispose of drilling muds in a Department of Environmental Quality-approved solid waste disposal site. Such solids may be tested prior to disposal to determine if they contain hazardous materials.

Plugging/Abandonment

The State Geologist may authorize suspension of operations for good cause for whatever time period is stated in the written authorization, and further extensions may be granted upon expiration of the authorization.

According to Rule 632-10-198, when a well is plugged, producing strata and strata with fluid at greater than hydrostatic pressure must be plugged with cement from 50 feet below to 50 feet above each stratum. A 100-foot cement plug must be placed across the base of the freshwater-bearing strata, when it is in open hole. When there is an open hole below the base of any casing, a cement plug must extend from 50 feet below to 50 feet above the base of the casing. All casing strings must be cut off at least 4 feet below the ground and plugged with cement to a depth of 10 feet. Intervals between plugs must be filled with heavy, mud-laden fill.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2. December 1985.

Olmstead, Dennis L. 1985. LettercCommuncation to EPA. Oregon Department of Geology and Mineral Industries.

USEPA. 1985. U.S. Environmental Protection Agency. Oregon Meeting Report. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop. December 1985. Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communication:

Kent Ashbaker. Department of Environmental Quality (503) 229-5325.

Dan Wermiel. Department of Geology and Mineral Industries (503) 229-5580.

STATE: Pennsylvania

AGENCIES: Department of Environmental Resources
* Bureau of Oil and Gas Management (BOGM)
Bureau of Waste Management (BWM)

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (BOGM) - Authorized by rule, which includes location restrictions and standards regarding depths to groundwater and bedrock, soil types, slopes, loading rates and soil incorporation standards.

Roadspreading - (BOGM) - Permitted for produced water on secondary roads.

Pits - (BOGM) - Reserve pits authorized by rule, which includes standards for capacity, freeboard, permeability, liner placement, depth to groundwater, and closure. All other pits require permit.

Surface water discharge - (BOGM) - Authorized by NPDES permit.

Waste haulers - Not regulated.

Burial or landfill - (BOGM-BWM) - On-site authorized by rule, which includes location and depth to groundwater restrictions as well as liner and closure requirements. Off-site regulated by permit.

EOR/injection wells - (BOGM) - Does not have UIC primacy. State and Federal permits required.

BONDING: Compliance bond required. Bond is conditioned on drilling, water supply replacement, plugging and surface restoration. Bond amount is $2,500 per well or $25,000 blanket bond.

ENFORCEMENT: Options include notice of violation, criminal citations, administrative order, cease order, civil penalties, bond forfeiture (bond is penal bond), and permit revocation or suspension. Attorneys are assigned to the Department.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Pennsylvania

Forms completed by: James E. Erb

Agency: Department of Environmental Resources (DER), Pennsylvania Bureau of Oil & Gas Management (BOGM)
Phone: (717) 783-9645

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DER, BOGM

Off-site disposal: DER, BOGM
DER, BWM

(DER, BOGM - Dept. of Environmental Resources, Bureau of Oil & Gas Management)
(DER, BWM - Dept. of Environmental Resources, Bureau of Waste Management)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

NPDES - EPA has delegated authority to the Department of Environmental Resources. Responsibilities have been given by Administrative decision to the Bureau of Water Quality Management, Mining and Reclamation, and Oil and Gas Management. A procedural MOA exists between the Bureau of Water Quality Management and the Bureau of Oil and Gas Management.

Solid Waste - The Bureau of Waste Management has primacy overall responsibility for solid waste management in Pennsylvania. The Legislation excludes "drill cuttings" from the definition of solid waste so long as they are regulated under the oil and gas regulations. Legislation also exempts on-site disposal of residual waste as long as the site is permitted and bonded under the oil and gas program.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

All are programs within the Department of Environmental Resources.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

All positions are located in the Bureau of Oil and Gas Management. Total 66 positions - Budget $2.75 Million

Note: The below does not include central office program development and support staff - 12.

1. Enforcement, field monitoring and inspection; 38

   Monitoring and Compliance Section Chief - 2
   Compliance Specialist - 3
   Water Quality Specialist - 2
   Oil and Gas Inspectors - 16
   Water Quality Specialist Supervisor - 11
   Oil and Gas Inspector Supervisor - 2
   Hydrogeologist - 2 part-time

2. Legal support; 3

   Regulatory Council - 1 part-time
   Litigation - 2 part-time

3. Permitting, siting, and administration; 15

   Technical Services Section Chief - 2
   Sanitary Engineers - 3
   Hydrogeologists - 2 part-time, same staff as for monitoring and inspection
   Geologists - 8

Please indicate, for each agency above, what type of training is needed for your staff.

Land application of wastes -- permitting and field staff

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DER, BOGM	DER, BOGM
b.	Roadspreading	DER, BOGM	DER, BOGM
c.	Pits	DER, BOGM	DER, BOGM
d.	Surface water disposal	DER, BOGM	DER, BOGM
e.	Waste haulers	n/a	DER, BOGM
f.	Burial or landfill	DER, BOGM	DER, BOGM
g.	Disposal wells	DER, BOGM	DER, BOGM
h.	Enhanced oil recovery injection wells	DER, BOGM (and EPA under DI UIC).	DER, BOGM (and EPA under DI UIC).

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	None - EPA Direct Implementation	None - EPA Direct Implementation
b.	Clean Water Act (NPDES)	DER, BOGM	DER, BOGM
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DER, BWM	DER, BWM
	Subpart D (Non-Hazardous)	DER, BOGM	DER, BWM

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Bonding - $2,500 per well or $25,000 blanket bond for 10 or more wells.
Includes site restoration (pit closure) and plugging (disposal wells).

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

DER can initiate all actions. There ar legal staff assigned to DER. The process is controlled by internal policy.

Please list the types of enforcement actions available?

Notice of Violation
Citation for summary offense
Misdemeanor
Civil Penalty
Injunction
Administrative Order
Consent Order & Agreement
Permit Suspension
Permit Revocation
Bond Forfeiture

PENNSYLVANIA

INTRODUCTION

Pennsylvania produced 3,301,763 barrels of oil and 163 x 10^9 cubic feet of gas in 1987. Production was from 13,225 oil wells and 28,000 gas wells.

Until 1955, requirements for the oil and gas industry were minimal if not nonexistent. State laws did not require permitting or registration of oil and gas wells. In 1961, the statutes were strengthened to prohibit wasting in production wells, establish spacing, and provide other requirements. It was not until 1984 that the Coal and Gas Resources Coordination Act and the Oil and Gas Act made sweeping changes in permit review and requirements. There had been little uniformity in Pennsylvania oil and gas laws until then. Combined, these statutes enable Pennsylvania permitting authority to put terms and conditions on permits and to deny permits. House Bill 1375, passed in mid-September 1986, further strengthens the regulatory management of the oil and gas industry in Pennsylvania and requires the development of new regulations relating to solid waste management and the diposal of wastes onsite.

The first commercial oil well in the United States was drilled near Titusville, Pennsylvania, in 1859.

REGULATORY AGENCIES

Five agencies regulate oil and gas activities in Pennsylvania:

* Department of Environmental Resources, Bureau of Oil and Gas Management;
* U.S. Environmental Protection Agency, Region III;
* Pennsylvania Fish Commission;
* U.S. Forest Service; and
* U.S. Bureau of Land Management.

The Bureau of Oil and Gas Management was created in 1984 to coordinate and combine all related regulatory activities of the oil and gas industry. The Oil and Gas Conservation Law, enacted in 1961, established powers and duties of the Oil and Gas Conservation Commission. Those powers and duties were transferred to the Department of Environmental Resources in 1970. Section 216 of the Oil and Gas Act of 1984 created an Oil and Gas Technical Advisory Board to advise the Department in regulatory activities. The five-member board consists of three representatives of the oil industry, one from the Citizen's Advisory Council, and one from the coal industry.

Section 207(a) of the Act requires that the disposal of drilling and production brines be consistent with the requirements of the Clean Streams Law (which was first passed in 1937 and was most recently amended in 1980). Section 208(a) requires that any well owner who affects the public or private water supply by pollution or diminution shall restore the affected supply or replace it with an alternative source. Section 205 prohibits the drilling of wells within 200 feet of buildings or water wells without the consent of the owner, within 100 feet of any body of water, or within 100 feet of a wetland 1 acre or more in size. There is a compliance bond conditioned upon the operator's faithful performance of the drilling, restoration, water supply replacement, and well plugging requirements of the Oil and Gas Act.

The U.S. Environmental Protection Agency, Region III, issues UIC program permits for underground injection and second recovery. The Bureau of Oil and Gas Management has not sought primacy in the UIC program.

The Pennsylvania Fish Commission seeks out pollution of surface waters and takes appropriate action under the Pennsylvania Fish and Boat Code.

Requirements of the U.S. Forest Service and the U.S. Bureau of Land Management are contained in lease agreements. The well driller must demonstrate that landowners and water supply owners have been notified of the intent to drill. Mineral rights in the Alleghency National Forest are privately owned. The Bureau of Oil and Gas Management issues drilling permits on Federal lands.

STATE RULES AND REGULATIONS

Drilling

Drill pits until recently were virtually unregulated. Pits typically were unlined. Such pits contain drilling cuttings, contaminated fresh and salt water produced during construction and well stimulation, and various additives used during drilling and well stimulation. Pits must be reclaimed and no permit is required for a drill pit. There is no contingency fund for the management of abandoned pits. Recent regulation, which became final in 1989, provide stringent standards for all pits. The thrust on drilling pits is to remove liquids to offsite and commercial treatment and disposal facilities and to dispose of solid wastes onsite with pit reclamation.

Production

Pits which remain onsite for oil/water separation during the production phase must be permitted or have a pit approval number. It has been estimated that Pennsylvania has 17,000 impoundments associated with oil and gas produced waters. These impoundments are currently being upgraded and permitted or are being closed. Permits are required for offsite and commercial treatment systems. The trend since 1985 has been to move in the direction of centralized treatment facilities for oil and gas waste materials. Nine such facilities are in operation, and eleven additional facilities have been permitted to treat solely production wastewaters.

Other production fluid disposal alternatives are discussed in the Oil and Gas Operator's Manual published by the Bureau of Oil and Gas Management. As the Manual notes, the practices suggested are options, not regulations. Alteratives include the following:

* Disposal wells;
* Annular disposal;
* Treatment and discharge to surface waters;
* Onsite treatment and land disposal of top hole water;
* Discharge to existing treatment facility;
* Road spreading; and
* Evaporation (through waste heat).

Since these alternatives are not binding regulations, it is largely left to the operator to choose acceptable techniques for disposal.

Offsite Disposal

Part II permits and NPDES permits are required for treatment facilities that discharge to waters of the Commonwealth. Treatment afforded production fluids include flow equalization, pH adjustment (if necessary), gravity separation and surface skimming, retention and settling, and aeration. The discharges from several offsite produced-fluids treatment facilities may be covered under a single NPDES permit if the management of those facilities is under the control of one owner/operator and the geographic area is such as to allow for effective monitoring and surveillance.

The NPDES permit criteria and limits are governed by receiving water quality standards. Generally, however, total suspended solids is limited to an instantaneous maximumof 60 mg/L and an average monthly of 30 mg/L. Oil and grease is limited to an instantaneous maximum of 30 mg/L and an average monthly of 15 mg/L. Dissolved iron has an instantaneous maximum of 7 mg/L, and the acidity must be less than the alkalinity.

Plugging/Abandonment

If wells are certified as having future utility and are in adequate condition to prevent a vertical flow of fluids, contamination of fresh water or damage of productive zones, an approval can be issued for inative status. Inactive status is valid for 5 years and is renewable.

Regulations on plugging required (1) cement plugs of at least 50 feet should be set 20 feet above each stratum that has had oil, gas, or water; (2) a cement plug of at least 50 feet of cement should be place 100 feet below the water string of casing, after which the casing should be drawn; and (3) all the spaces between the bottom or top of the well and cement plugs, or between the cement plugs, should be filled with sand pumpings, mud, or other equally nonporous material. Additional plugging requirements are specified for wells passing through workable coal seams.

References

Department of Environmental Resources, Oil and Gas Developments in Pennsylvania in 1987. 1988.

Department of Environmental Resources. Rules and regulations. Chapter 97, Industrial Wastes, and Chapter 78, Oil and Gas Wells.

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, December 1985.

Oil and Gas Act. Act of 12-19-84. P.L. 1140, No. 223.

Oil and Gas Conservation Law. 1961. P.O. Box 825, No. 359.

Slack, Peter. 1985. Letter communication with EPA Division of Permits and Compliance, Bureau of Water Quality Management, Department of Environmental Resources.

Personal Communication:

Carlyle Westlund, Bureau of Oil and Gas Management (717) 783-9645.

STATE: South Dakota

AGENCIES: Department of Water and Natural Resources (DWNR)
* Division of Environmental Regulation (DER)
Department of Schools and Public Lands
U.S. Bureau of Land Management (BLM)
U.S. Forest Service (USFS)
U.S. Environmental Protection Agency (EPA)

MOU: Yes, with EPA

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - Not allowed

Roadspreading - Not allowed

Pits - Reserve pits allowed to evaporate prior to closure. Production waters allowed to be discharged to retention-evaporation ponds. Liners required.

Surface water discharge - SD does not have NPDES primacy. Two NPDES permits issued because of beneficial use.

Waste haulers - Regulated by DER

Burial or landfill - Drill cuttings buried in pit on site.

EOR/injection wells - SD has UIC primacy. Produced well fluids may be disposed by injection, after notice and hearing.

BONDING: Compliance bond required. Bond is conditioned on plugging and abandonment and surface restoration. Bond amount is $5,000 for plugging and $2,000 for surface restoration for each well, or blanket bonds of $20,000 for plugging and $10,000 for surface restoration.

ENFORCEMENT: Notify operator (usually resolved at this level); Attorney General notifies operator and arranges administrative hearing; court action initiated by Attorney General

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: South Dakota

Forms completed by: Fred V. Steece

Agency: South Dakota Dept. of Water and Natural Resources (DWNR)
Phone: (605) 394-2229

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DWNR-OGP
BLM
EPA

Off-site disposal: DWNR-OWQ
BLM
EPA

(DWNR-OGP - Dept. of Water & Natural Resources, Oil & Gas Program)
(DWNR-OWQ - Dept. of Water & Natural Resources, Office of Water Quality)
(BLM - U.S. Bureau of Land Management)
(EPA - U.S. Environmental Protection Agency)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

1. DWNR-OGP and BLM: no lead agency; BLM regulates activites on Federal minerals, DWNR-OGP regulates on all others; no MOA.

2. DWNR-OGP and DWNR-OWQ: jurisdiction mandated by state statute; cooperative agreement.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   OGP: 3 persons, budget approx. $50,000.00
   OWQ: 1 person, budget approx. $15,000.00

2. Legal support; and

   OGP: Legal support provided by State of South Dakota. Attorney General
   OWQ: Legal staff shared with other agencies

3. Permitting, siting, and administration.

   OGP: 3 persons, budget approx. $50,000.00
   OWQ: 1 person, budget approx. $15,000.00

Please indicate, for each agency above, what type of training is needed for your staff.

Bachelor's Degree in Geology or Engineering or equivalent experience

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	Not allowed	Not allowed
b.	Roadspreading	Not allowed	Not allowed
c.	Pits	DWNR-OGP	DWNR-OWQ
d.	Surface water disposal	EPA	EPA
e.	Waste haulers	DWNR-OGP	DWNR-OWQ
f.	Burial or landfill	DWNR-OGP	DWNR-OWQ
g.	Disposal wells	DWNR-OGP	DWNR-OGP
h.	Enhanced oil recovery injection wells	DWNR-OGP	DWNR-OGP

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DWNR-OGP	DWNR-OGP
b.	Clean Water Act (NPDES)	DWNR-OWQ	DWNR-OWQ
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DWNR-OWQ	DWNR-OWQ
	Subpart D (Non-Hazardous)	DWNR-OWQ	DWNR-OWQ

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Plugging and Performance Bond: $5,000 per well or $20,000 blanket required by OGP.

Surface Restoration Bond: $2,000 per well or $10,000 blanket required when surface owner not party to the oil and gas lease.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Agencies initiate enforcement actions; if operator does not respond, Attorney General initiates legal action and court proceedings, if necessary.

Please list the types of enforcement actions available?

1. Notify operator, usually resolved at this leve.
2. Attorney General notifies operator, arrange administrative hearing, Board may assess fines.
3. Court action is initiated by Attorney General.

SOUTH DAKOTA

INTRODUCTION

South Dakota produced 1,612,632 barrels of oil and 4.7 x 10_9 cubic feet of gas in 1989. The State has 141 full production and 17 stripper oil wells, and 53 full production gas wells and 1 stripper gas well.

REGULATORY AGENCIES

These agencies regulate oil and gas activities in South Dakota:

* South Dakota Department of Water and Natural Resources;
* South Dakota Department of School and Public Lands;
* U.S. Bureau of Land Management;
* U.S. Environmental Protection Agency, Region VIII; and
* U.S. Forest Service.

The South Dakota Department of Water and Natural Resources is the primary regulatory agency for oil and gas operating through its Oil and Gas Program in the Division of Environmental Regulation. The primary enforcement agency for UIC program, which also has nondelegated responsibility for NPDES compliance, is the Department's Office of Water Quality. The Department of Water and Natural Resources also houses the Board of Minerals and Environment, which has the power to conduct hearings and take action on other oil and ga program-related enforcement measures.

South Dakota has not been delegated NPDES authority. Two of the active wells have NPDES permits because of beneficial use associated with wastewaters. Draft NPDES permits are prepared by the State and issued by the Water Management Division, U.S. Environmental Protection Agency, Region VIII.

In order to drill on Federal lands, two applications for drilling are filed--one with the State Department of Water and Natural Resources and one with the U.S. Bureau of Land Management. The State defers to the Bureau regarding any predrilling permit investigation. Two permits, one from each entity, are issued to the operator. When a request to inject drilling fluids underground is received, the Bureau defers to the State, and the State would issue the injection permit. Since the Bureau has no means of holding hearings, the State Board of Minerals and Environment does so prior to permit issuance.

The South Dakota Department of School and Public Lands has enforcement powers for lease compliance on State-owned lands and for State-owned minerals.

STATE RULES AND REGULATIONS

Drilling

When drilling operations cease, supernatant fluid in the drilling pit is allowed to evaporate and the mud is allowed to dry. The time interval required varies; when the mud has dried sufficiently, the pit is buried and the surface is reclaimed to natural conditions. Resotration must be completed within one year.

The Department of Water and Natural Resources requires a Plugging and Performance Bond for wells and a Surface Restoration Bond, required when the surface owner is not a party to the oil and gas lease.

Production

Discharge of produced wastes is permitted to total retention-evaporation ponds, to Class II UIC wells, and for beneficial use. Rule 74:10:03:13 requires that, "All pits must be constructed, maintained and reclaimed so as to prevent contamination of soil and all waters of the state. Under no circumstances may these pits be used for disposal, dumping or storage of fluids, wastes, hazardous materials and other debris not commonly used in these operations." The rule also states that, "Pits shall not be located in stream beds...or established drainages." Synthetic membrance liners "...are required in all pits, unless a variance is granted...for good cause shown." Pits must also be constructed so that..."the bottom of the pit is above the seasonal high water table." Pits must be reclaimed within one year of site abandonment.

When wells are drilled on Federal minerals, the BLM and USFS may have requirements that are in addition to those of the State of South Dakota.

Discharge of produced water from a producing oil well is allowed when a beneficial use of the water can be documented. An NPDES permit is required for such a discharge. The two NPDES-permitted discharges from wells in South Dakota are used for stock watering. NPDES permits contain not-to-exceed limits for oil and grease of 10mg/L, total dissolved solids of 5,000 mg/L, and a pH of 6.0 to 9.0. The flow is not to exceed 4,500 gallons per day.

Offsite Disposal

There are no offsite pits inuse, but if there were a request for such usage, the request would be managed through the solid waste permitting process under the Board of Minerals and Environment.

Plugging/Abandonment

A well may be classified as temporarily abandoned for a period of 6 months for good cause, and this status may be extended on a case-by-case basis.

Wells must be plugged when they can no longer fulfill the purpose for which they were drilled. Plugging must follow scheduling and requirements approved by the Department's Oil and Gas Supervisor.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production, June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Pirner, S.M. 1986. Letter communication to EPA. South Dakota Department of Water and Natural Resources, Office of Water Quality.

Personal Communications:

Steven M. Pirner, DWNR, Office of Water Quality. (605) 773-3351.

Fred V. Steece, DWNR, Supervisor of Oil and Gas Program, (605) 394-2229.

STATE: Tennessee

AGENCIES: State Oil and Gas Board (SOGB)
Department of Health and Environment (TDHE)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming -

Roadspreading -

Pits - (SOGB) - Pits requirements are included in the well permit. Pits for production fluids must be lined.

Surface water discharge - (TDHE) - NPDES primacy delegation.

Waste haulers -

Burial or landfill - (SOGB-TDHE) -

EOR/injection wells - (TDHE) - Direct implementation of UIC program by EPA. Produced fluids reinjected for disposal and enhanced recovery.

BONDING: Compliance bond required, in the form of cash, certified check, surety, letter of credit, or certificate of deposit. Bond is conditioned on compliance with laws and regulations, the filing of records, and proper plugging. Reclamation bond is also required, and is conditioned on ground cover survival over 2 growing seasons. Bond amount is $2,000 per well ($1,000 for domestic gas) for plugging and $1,500 per well restoration. Blanket bonds are $10,000 for plugging.

ENFORCEMENT: Administrative remedies available and administrative penalties authorized. Civil penalties can be pursued. No indication of criminal penalties.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Tennessee

Forms completed by: Ronald P. Zurawski

Agency: Tennessee State Oil and Gas Board (SOGB)
Phone: (615) 742-6694

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: SOGB
TDHE

Off-site disposal: SOGB
TDHE

(SOGB - State Oil and Gas Board)
(TDHE - Tennessee Department of Health and Environment)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

On-Site--SOGB - Chapter 1040-4-1 of General Rules and Regulations

Off-Site--TDHE - Tennessee Code Annotated 69-3-102

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

n/a

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   State Oil and Gas Board - 4 - $122,000.00
   Tennessee Department of Health and Environment - 3 - $20,000.00

2. Legal support;

   State Oil and Gas Board - 1 - part time support - $1,800.00
   Tennessee Department of Health and Environment - 1 - shared - $9,000.00

3. Permitting, siting, and administration; and

   State Oil and Gas Board - 3 - $128,000.00
   Tennessee Department of Health and Environment - 3 - $25,000.00

Please indicate, for each agency above, what type of training is needed for your staff.

State Oil and Gas Board
Inspection - Degree in natural or physical sciences plus oil and gas experience.
Administration - Degree in geology or engineering geology.

Tennessee Department of Health and Environment
Enforcement - Degree in biology, engineering or geology.
Administration - Degree in biology, engineering or geology.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming		
b.	Roadspreading		
c.	Pits	SOGB	
d.	Surface water disposal	TDHE	
e.	Waste haulers		TDHE
f.	Burial or landfill	SOGB	
g.	Disposal wells		
h.	Enhanced oil recovery injection wells		

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	TDHE	TDHE
b.	Clean Water Act (NPDES)	TDHE	TDHE
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	TDHE	TDHE
	Subpart D (Non-Hazardous)	TDHE	TDHE

3. List any financial assurance requirements for oil and gas exploration and production wastes:

None

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

State Oil and Gas Board - Administrative issuance of citations.
Tennessee Department of Health and Environment - Administration issuance of remedial action orders and attorney general initiation of administration actions.

Please list the types of enforcement actions available?

State Oil and Gas Board - Administrative issuance of civil penalties.
Tennessee Department of Health and Environment -
- Notices of violation
- Commissioner's agreed orders
- Civil penalties

No memorandums of understanding or agreements exist.

TENNESSEE

INTRODUCTION

Tennessee produced about 600,000 barrels of oil from 927 wells in 1988. Only 22 oil wells produced more than 10 barrels of oil per day. Of 802 gas wells, 794 produced less than 60 thousand cubic feet per day.

Regulation of oil and gas drilling operations began in 1968. Wells drilled prior to 1968 do not have to be permitted unless they are deepened, reopened, or reentered.

REGULATORY AGENCIES

Three agencies regulate oil and gas activities in Tennessee:

* State Oil and Gas Board;
* Tennessee Department of Health and Environment; and
* U.S. Department of the Interior, Bureau of Land Management.

The State Oil and Gas Board of the Tennessee Department of Conservation is authorized by the Tennessee Code Annotated (Revised 1989) to regulate activities related to the production of oil and gas in Tennessee. The State Oil and Gas Board regulates the industry according to the General Rules and Regulations (Tennessee State Oil and Gas Board Statewide Order No. 2). The State Oil and Gas Board issues drilling permits and regulates surface disposal.

The Department of Health and Environment is the NPDES authority in Tennessee. It does not currently have UIC primacy and is not currently working toward being granted primacy by EPA. Discharges of oil and gas wastes are not permitted by the Tennessee Department of Health and Environment.

The U.S. Bureau of Land Management has jurisdiction over lease arrangements and post lease activity on Federal lands where the mineral rights are Federally held. Surface rights in Federal forests and grasslands are retained by the U.S. Forest Service.

STATE RULES AND REGULATIONS

Drilling

Much of the drilling in Tennessee is air drilling. The most common types of wastes in drilling pits are foaming agents used during the drilling process and spent acids from well treatments.

Before an applicant can complete the permit process and begin to drill, one of the Board's inspectors must approve access roads and all pollution control structures, including pits, dikes, diversion drainage ditches, and tanks. In addition, during drilling, inspectors are required to monitor casing programs, particularly with respect to circulation of cement behind the surface casing to reduce the likelihood of ground-water contamination.

The Board requires operators to drain surface pits of water and backfill them with dirt immediately after they are no longer needed for drilling or testing. The well location and access roads must also be graded and stabilized within thirty days of the initial disturbance, and temporary vegetative cover established on all graded areas.

Produced Water

Produced salt water may be injected into a subsurface formation productive of hydrocarbons, if part of an approved secondary recovery project, into a subsurface formation not productive of hydrocarbons, if through an approved salt water disposal well, or else may be transported off-lease to an authorized salt water disposal facility if prior approval has been granted by the Board. Salt water may be discharged to and temporarily stored in lined pits, but must be removed before it can leak into underground water. All pits or ditches used for temporary storage or transport of salt water must be lined with an impermeable man-made liner.

Plugging/Abandonment

Dry wells must be plugged within 6 months after drilling is finished, with an extension of 90 days for good cause. Gas wells that pass a deliverability test may be classified as shut-in indefinitely. Wells no longer used for the purpose for which they were drilled or converted must be plugged. Wells that are neither producing nor plugged must be cased and capped to protect oil, gas, and fresh water. Plugging and reclamation bonds are required for all wells drilled after January 1, 1988. Dry wells may be converted to water wells if approved by the Department of Health and Environment.

When plugged, wells must be filled with sufficient mud to offset the hydrostatic pressure of any formation penetrated. Adequate plugs must be placed to prevent the commingling of fluids and to isolate extractable minerals. Within thirty days of the plugging of any well, all production related supplies and equipment must be removed, any remaining excavations filled, and any remaining disturbed areas graded. Permanent vegetative cover must then be established on all disturbed areas.

References

State of Tennessee - State Oil and Gas Board. General Rules and Regulations, Statewide Order No. 2, effective November 1972.

State of Tennessee State Oil and Gas Board. Oil and Gas Laws in Tennessee Mineral Test Hole Regulatory Act, Amendments added 1989.

Zurawski, Ronald P. 1985. Drilling Waste Conference submittal.

_____. 1985. EPA Onshore Oil and Gas Workshop request for information on Tennessee activity and technology.

STATE: Texas

AGENCIES: * Texas Railroad Commission (TRC)
Texas Water Commission (TWC)

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (TRC) - On-site landfarming of low chloride drilling fluid authorized by rule with restrictions. Off-site and commercial landfarming of drilling fluid requires permit.

Roadspreading - (TRC) - Allowed in certain areas by permit.

Pits - (TRC) - Basic sediment, completion/workover, flare, fresh makeup water, mud circulation, reserve, and water condensate pits are authorized by rule with restrictions. Any other pit requires and individual permit.

Surface water discharge - (TRC) - Requires an individual state permit.

Waste haulers - (TRC) - Salt water haulers regulated by permit.

Burial or landfill - (TRC-TWC) - Burial of dried water based drilling mud and cuttings generated during use of oil base drilling mud authorized by rule. All other burial or landfarming of oil and gas waste requires a permit.

EOR/injection wells - (TRC) - Delegated Class II program. More than 90% of produced water is injected.

BONDING: Compliance bond required, in the form of a surety bond or letter of credit. Bond conditioned on proper plugging and abandonment or returning well to active status. Bond amount depends on number of inactive wells and ranges from $10,000 to $200,000.

Authority to require performance bonds to ensure proper operation and closure of facilities that store, handle, treat, reclaim, or dispose of oil and gas wastes, other than those used in conjunction with the operation of an individual oil or gas lease.

ENFORCEMENT: Administrative actions are taken by the Railroad Commission. These include enforcement letters, pipeline severance, zero allowable, seal, permit revocation, and administrative penalties. Civil penalty and injunctive actions are taken through the Attorney General.

COMMENTS: One-time annular disposal of reserve pit fluids are permitted. Producers required to keep records of produced water. General no pollution standard.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Texas

Forms completed by: Jerry Mullican

Agency: Texas Railroad Commission (TRC)
Phone: (512) 463-6790

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: TRC

Off-site disposal: TRC

(TRC - Texas Railroad Commission)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

MOU's exist between The Railroad Commission of Texas, The Texas Water Commission, and The Texas Department of Health and are on file.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   215

2. Legal support;

   12

3. Permitting, siting, and administration; and

   225

Please indicate, for each agency above, what type of training is needed for your staff.

All employees receive training in the Commission's rules and procedures. Most of the staff also receive training in the use of the Commission's extensive main-frame computer system and in the use of personal computers. Many employees have had previous oilfield experience or have worked for other regulatory agencies.

In addition to staff training, the Commission conducts statewide seminars for operator training.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	TRC	TRC
b.	Roadspreading	TRC	TRC
c.	Pits	TRC	TRC
d.	Surface water disposal	TRC	TRC
e.	Waste haulers	TRC	TRC
f.	Burial or landfill	TRC	TRC
g.	Disposal wells	TRC	TRC
h.	Enhanced oil recovery injection wells	TRC	TRC

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	TRC	TRC
b.	Clean Water Act (NPDES)	TRC	TRC
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	TRC	TRC
	Subpart D (Non-Hazardous)	TRC	TRC

3. List any financial assurance requirements for oil and gas exploration and production wastes:

The Railroad Commission has statutory authority to require financial assurance for certain types of operations. The Commission may require a person applying for or acting under a permit to store, handle, treat, reclaim, or dispose of oil and gas waste to maintain a performance bond or other form of financial security conditioned that the permittee will operate and close the facility in compliance with the permit conditions. Bond requirements for commercial disposal operations and reclamation plants are currently being developed.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

The Railroad Commission initiates enforcement action through administrative proceedings. The Railroad Commission may request that the Texas Attorney General's Office seek civil penalties or injunctive relief when Commission action has not resolved a violation.

Please list the types of enforcement actions available?

The Railroad Commission has the following enforcement actions available: enforcement letter, pipeline severance, zero allowable, seal, permit revocation, and administrative penalties. The Commission may also seek civil penalities through the Attorney General's Office.

TEXAS

INTRODUCTION

In 1985, Texas produced over 830 million barrels of oil from over 210,000 wells. Gas production was 5,805 billion cubic feet from 68,811 gas wells. It is estimated that 75 percent of all active Texas wells are marginally producing wells.

Regulation of the oil and gas industry in Texas began when the Railroad Commission was assigned jurisdiction over oil and gas activities in 1919.

REGULATORY AGENCIES

Oil and gas activities in Texas are regulated almost entirely by the Railroad Commission. The Railroad Commission is responsible for the prevention of both waste and pollution. Thus, one agency is responsible for well spacing, construction requirements (casing, etc.), and most aspects of the environmental protection.

The following agencies are also involved in certain aspects of the disposal of oil and gas wastes in Texas:

* Texas Water Commission;
* Texas Air Control Board;
* Texas Parks and Wildlife Department;
* U.S. Army Corps of Engineers; and
* U.S. Environmental Protection Agency.

In 1985, the Texas legislature amended Section 91.101 of the Natural Resources Code, as well as Section 26.131 of the Water codes, to make explicit the scope of authority of the Railroad Commission with respect to activities related to the exploration, development, and production of oil and gas. It specified that production activities include activities associated with natural gas or natural gas liquids processing plant and activities associated with the storage, handling, reclamation, gathering, transportation, or distribution of oil and gas prior to the refining of the oil or the use of the gas. It also specificially included within the jurisdiction of the Commission the drilling of injection-water source wells that penetrate the base of usable quality water. These wells produce water to be used in enhanced recovery injection wells. The major change in the statute was the specification of activities that were to be considered related to "production."

Statewide Rule 8 (governing "water protection") of the Railroad Commission was amended effective January 6, 1987, to incorporate these changes in the Natural Resources Code.

The Railroad Commission issues permits for any discharges related to oil and gas exploration, development, and production activities. Since the State currently does not have NPDES jurisdiction, such discharges are also subject to EPA permitting.

The Railroad Commission has jurisdiction over Class Ii underground injection wells and has undertaken a study to determine the need for a Class I well program for wells under its jurisdiction, specifically wells used for the injection of gas plant wastes. Currently, all injection of gas plant wastes in Texas is subject to Class II requirements. The preliminary results of the Commission's study indicate that gas plant injection wells in the State meet Class II well criteria.

The Texas Water Commission advises the Railroad Commission on certain water quality matters. For example, the Railroad Commission requires that wells be cased and cemented to protect usable quality ground water in accordance with Texas Water Commission recommendations. The Texas Water Commission also sets surface water quality standards for the state.

The Texas Air Control Board has jurisdiction over the regulation of oil field activities generating air emissions.

The Texas Parks and Wildlife Department, Pollution Surveillance Branch, investigates fish kills and water pollution complaints and evaluates the effects of discharged wastes on fish and wildlife. The Texas Parks and Wildlife Department has statutory authority to recover the monetary value of damaged fish and wildlife.

The Texas Railroad Commission has jurisdiction over oil and gas activities on Federal lands in Texas, regardless of who owns the mineral rights.

The U.S. Army Corps of Engineers has permitting responsibility for any activities that would affect wetlands subject to Section 404 of the Clean Water Act.

STATE RULES AND REGULATIONS

General

Texas Statewide Rule 8 prohibits any "person conducting activities subject to regulation by the [Railroad] Commission" from causing or allowing pollution of surface or subsurface waters in Texas. With limited exceptions (e.g., landfarming or burial of drilling fluids under specified conditions), "no person may dispose of oil and gas wastes by any method without obtaining a permit to dispose of such wastes." The exceptions are authorized in Rule 8, under conditions specified in the Rule. The Rule's "authorizations" thus serve the same function as "general permits" in some other States. Under Statewide Rule 9, permits are required for disposal of oil and gas waste by injection into formations not productive of oil or gas. Statewide Rule 46 requires permits for injection into productive formations.

Drilling Wastes

Pit Construction Permits

The Railroad Commission authorizes, by Rule, the maintenance and use without a permit or reserve pits, mud circulation pits, completion/workover pits, basic sediment pits, flare pits, fresh makeup water pits, and water condensate pits, provided that such pits are operated and closed as required by Rule 8. The use of reserve pit and mud circulation pits for oil and gas wastes is restricted to drilling fluids, drill cuttings, sands, silts, wash water, drill stem test fluids, and blowout preventer test fluids.

Permits are required for drilling fluid storage pits (other than mud circulation pits), drilling fluid disposal pits (other than reserve pits or slush pits), and any other pits not specifically authorized by the Rule. For pits requiring permits, pit locations are evaluated on a case-by-case basis to determine what construction requirements are necessary to prevent waste of oil and gas resources or pollution of surface water or ground water. Proposed unlined pits, which will be continuous-use saltwater pits, are also evaluated to determine whether these pits would cause pollution of surrounding productive agricultural land. The requirements may or may not include liners.

Pit Closure

The Railroad Commission requires that pits be dewatered, backfilled, and compacted for closure. Backfill requirements (for all types of pits) vary according to the type of pit and the chloride concentration of the pit contents. Reserve pits (and mud circulation pits) containing fluids with a concentration of over 6,100 mg/L chloride must be dewatered within 30 days of cessation of drilling operations. Reserve pits containing fluids with a concentration of 6,100 mg/L or less must be dewatered within a year. In both cases, backfilling must be carried out within a year of the cessation of drilling operations. Because of dewatering time limits, reserve pit fluids may need to be hauled offsite for disposal.

Completion/workover pits must be dewatered within 30 days and backfilled and compacted within 120 days of cessation of completion or workover operations.

Disposal

Rule 8 authorizes landfarming or burial of water-based drilling fluids and associated wastes that meet specific conditions. The authorizations do not extend to oil-based drilling fluids, which require a permit for disposal.

The authorization for landfarming applies where water-based drilling fluids have chloride concentration equal to or less than 3,000 mg/L. Under the authorization, the wastes must be disposed of on the same lease where generated, and the operator must have the written consent of the landowner. Landfarming encompasses sprinkler irrigation, trenching, injecting under the surface, discing, and surface spreading by vehicles: the waste must be applied in such a way that it will not migrate off the landfarmed area.

Where the water-based drilling fluids have a chloride concentration in excess of 3,000 mg/L, but the wastes have been dewatered, burial is authorized at the well site where the waste is generated.

One-time disposal of reserve pit fluids down the annulus of a well is allowed, but requires a "minor permit" for each disposal incident.

Any other disposal methods must be approved by individual permits.

Produced Fluids

More than 90 percent of produced waters are disposed of by injection, with most of the remainder disposed of in coastal ("tidally influenced") waters. Less than 1 percent is disposed of in pits.

Pits

Individual permits are required for produced water pits, collecting pits, skimming pits, emergency saltwater storage pits, and saltwater disposal pits.

A 1984 amendment to Rule 8 required the re-permitting or closure of all previously permitted lined or unlined pits for the storage or disposal of oil field produced waters. With the exception of emergency saltwater storage pits, permits for unlined pits will be granted only if the operator can "conclusively" show that "use of the pit cannot cause pollution of surrounding productive agricultural land nor pollution of surface or subsurface water." Since the amendment, the Railroad Commission has received approximately 8,900 permit applications for all types of pits, half of which are for emergency saltwater storage pits used in connection with injection and storage wells. Of the 8,900 applications, 2,675 are for pits that were permitted prior to the amendment. As of December 1, 1986, the Commission had received 388 applications for saltwater disposal pits (unlined, because of the need for both evaporation and percolation for disposal purposes); 13 were approved, 233 denied, with the rest still under consideration. Approvals were largely for low-chloride (<500 ppm chloride) produced waters in areas where there was no possible impact on fresh subsurface water. The Commission expects to complete the processing of the 8,900 applications by late 1988.

Specific lining/monitoring requirements are determined on a case-by-case basis. Generally, all continuous-use pits (e.g., skimming pits) would require linings, as would emergency saltwater storage pits in sandy soils.

Injection

Class II injection wells are used both for enhanced recovery (36,368 wells) and disposal (16,404 wells). Requirements for Class II enhanced recovery wells are found in Rule 46 of the Texas Railroad Commission; requirements for Class II disposal wells are found in Rule 9.

The Commission requires that a newly drilled disposal well have surface casing set to fully protect underground sources of drinking water with cement circulated to the surface. Rule 9 stipulates that the well must be equipped with tubing set on a mechanical packer, set no higher than 100 feet above the top of the permitted injection interval.

Mechanical integrity tests must be conducted before injection begins, and at least once every 5 years thereafter. Most mechanical integrity tests are pressure tests. Test pressure must equal the maximum authorized injection pressure of 500 psig, whichever is less, but in no case less than 200 psig. Tests are acceptable if they are conducted at a pressure within 10 percent of the pressure required by the formula. However, once the casing pressure stabilizes, a test must be conducted for 30 minutes with no variation.

Specifications under Rule 46 for enhanced recovery wells are identical with respect to casing, the requirement for using tubing and packer, and mechanical integrity tests. The required setting for the packer is no higher than both 200 feet below the known top of cement behind the long string casing and 150 feet below the base of usable quality water.

Surface Discharge

The Railroad Commission allows discharge of produced water into coastal areas under individual permits, provided the discharge does not cause a violation of Texas Surface Water Quality Standards. Sufficient collecting and skimming pits must be maintained to prevent any oil from entering the tidal waters. Random samples of the discharged produced water must be tested for oil content every 30 to 40 days.

Offsite Disposal

Transportation

Persons who transport produced water for hire (other than by pipeline) must hold a Salt Water Hauler Permit from the Railroad Commission. Haulers must keep a record of the volume of water transported, the property from which it originated, and the amount delivered to which specific disposal facility. Similar records must be kept by the producer. No requirements of this type are imposed on the transport of drilling fluids.

Disposal

All offsite disposal of oil and gas wastes requires individual permitting. The primary offiste facilities in Texas are disposal wells that receive materials by truck. There are approximately 200 Class II commercial wells in Texas.

In addition, there are approximately 100 central disposal pits for drilling fluids, 50 to 75 central drilling fluid landfarming facilities, and a few facilities for the treatment and discharge of drilling fluids in coastal areas. Management requirements for these facilities are determined on a case-by-case basis.

Plugging/Abandonment

Plugging procedures for dry or inactive wells must commence within 1 year of the cessation of drilling or operations. In addition, a reasonable extension of time is available at the discretion of the Director of the Oil and Gas Division if: (1) the well does not present a pollution hazard, and (2) the operator has posted a plugging bond or letter of credit, presented a plan for further use of the well in enhanced recovery operations, or paid a $100 fee and obtained a permit for re-entry.

A well-plugging fund has been established to enable the State to plug abandoned wells. The major source of funding is provided by a $100 drilling permit fee.

Cement plugs should be set by the circulation or squeeze method through tubing or drill pipe, and should have sufficient volume to fill 100 feet of hole plug 10 percent for each 1,000 feet of hole from the ground surface to the bottom of the plug. All portions of the well not filled with cement must be filled with mud-laden fluids of at least 9.5 lb/gal.

For wells with surface casing, plugging requirements depend on whether the surface casing is set to protect allusable water quality strata. Where it does, a cement plug should be set to extend from at least 50 feet below to 50 feet above the shoe of the surface casing. Where the casing has been set deeper than 200 feet below the base of the deepest usable water strata, an additional plug, within the casing, must extend from at least 50 feet below to at least 50 feet above the base of the lowest such stratum. Where the casing does not afford such protection, in addition to the plug placed across the base of usable quality water, a similar plug must be placed across the shoe of the surface casing.

For wells with intermediate or production casing that have been cemented through all usable quality water or productive horizons, a cement plug must be placed inside the casing and extend from at least 50 feet below to at least 50 feet above the base of the deepest usable quality water stratum. Where such casing has not been cemented through all strata and horizons, the casing must be perforated at the required depths to place cement outside the casing by squeeze-cementing. A plug should also be set above each perforated interval or open hole completion.

For wells without production casing and open hole completions, productive horizons or formations in which pressure or formation water problems exist should be isolated by plugs centered at the top and bottom of the formations. Such plugs are to be continuous if the formation is less than 100 feet thick.

The District Director may require additional plugs to cover and contain any productive horizon or to separate any water stratum from any other water stratum if the water qualities or hydrostatic pressures differ significantly to justify separation.

References

Interstate Oil Compact Commission, 1985. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Texas Railroad Commission. Application information - casing/annulus disposal of drilling fluid. Not dated.

_____. Letter communcation to EPA. October 1985.

Texas Railroad Commission, Oil and Gas Division. 1985. Annual report - 1985.

_____. 1985. Rules having statewide application to oil, gas, and geothermal resource operations within the State of Texas. September 1985.

_____. 1985. Water protection manual. April 1985.

Texas surface water quality standards. TDWR Publication LP-71.

USEPA. 1985. U.S. Environmental Protection Agency. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop December 1985. Washington, D.C.: U.S. Environmental Protection Agency.

Personal Communications:

William H. Barnes, Texas Railroad Commission (512) 463-6790.

Windle J. Taylor, Texas Railroad Commission (512) 463-6803.

Lori Wrotenbery, Texas Railroad Commission (512) 463-6769.

STATE: Utah

AGENCIES: Department of Natural Resources
Division of Oil, Gas and Mining (DOGM)
Department of Health (DOH)
U.S. Bureau of Land Management (BLM)

MOU: No

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DOGM-DOH) -

Roadspreading - (DOGM-DOH) -

Pits - (DOGM-DOH) - Reserve pit supernatent is generally allowed to evaporate before pit closure. Surface disposal into unlined pits is allowed for produced waters containing less than 5,000 mg/l TDS. Other produced water pits must be lined.

Surface water discharge - (DOGM-DOH) - Not allowed.

Waste haulers -

Burial or landfill - (DOGM-DOH) -

EOR/injection wells - (DOGM) - Delegated Class II program. Most produced water is injected for enhanced recovery or disposal.

BONDING: Compliance bond required. Bond conditioned on well plugging and repair, and on well site maintenance or restoration. Bond amount depends on depth, and ranges from $10,000 to $40,000 per well with blanket bonds set at $80,000.

ENFORCEMENT: Enforcement actions available include letters, orders to show cause, and penalties through court proceedings.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Utah

Forms completed by: Gilbert L. Hunt

Agency: Utah Division of Oil, Gas, and Mining (DOGM)
Phone: (801) 538-5340

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DOGM
BLM

Off-site disposal: DOGM
DOH
BLM
DEH

(DOGM - Division of Oil, Gas, and Mining)
(DOH - Department of Health)
(BLM - Bureau of Land Management)
(DEH - Division of Environmental Health)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The Division of Oil, Gas and Mining is the lead agency for disposal of oil-field waste as mandated by law. The Health Department has environmental responsibilities and would also be the lead agency for any hazardous wastes that maybe associated with production operations, if any. Bureau of Land Management has responsibility for tracking of wastes on federal and Indian lands.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

2. Legal support;

3. Permitting, siting, and administration; and

Please indicate, for each agency above, what type of training is needed for your staff.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DOGM/DOH	DOGM/DOH
b.	Roadspreading	DOGM/DOH	DOGM/DOH
c.	Pits	DOGM/DOH	DOGM/DOH
d.	Surface water disposal	DOH/DOGM	DOH/DOGM
e.	Waste haulers		
f.	Burial or landfill	DOGM/DOH	DOGM/DOH
g.	Disposal wells	DOGM	DOGM
h.	Enhanced oil recovery injection wells	DOGM	DOGM

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	DOGM	DOGM
b.	Clean Water Act (NPDES)	DOH	DOH
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)	DOH	DOH
	Subpart D (Non-Hazardous)	DOH	DOH

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Newly constructed commercial water disposal pits are required to be bonded with the state.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

When administrative actions are exhausted penalties must be pursued through the civil court system.

Please list the types of enforcement actions available?

Letters
Orders to show cause
Penalties through court

UTAH

INTRODUCTION

Utah produced 33,017,552 barrels of oil and 277,566,383 MCF of gas in 1988 from 2,580 oil wells and 1,244 gas wells. This gas production volume includes recycled injection gas attributed mainly to pressure maintenance operations at the Anschutz Ranch East field.

REGULATORY AGENCIES

Four agencies share regulatory responsiblity for oil and gas activities in Utah:

* Utah Department of Natural Resources, Division of Oil, Gas and Mining;
* Department of Health, Bureau of Water Pollution Control;
* U.S. Bureau of Land Management (and possibly the Bureau of Indian Affairs); and
* U.S. Forest Service (surface rights only).

The Division of Oil, Gas and Mining revised the Oil and Gas Conservation General Rules effective March 1989. These rules cover drilling and operating practices; UIC Class II injection well responsibility; disposal pit permitting and operation; and purchasing, transportation, refining, and refining.

The U.S. Department of the Interior, Bureau of Land Management, has jurisdiction over lease arrangements and post-lease activity on federal lands where the mineral rights are federally held. Surface rights in federal forests and grasslands are retained by the U.S. Forest Service.

STATE RULES AND REGULATIONS

Drilling

Rule R615-3-15 of the Division of Oil, Gas and Mining rules requires oil and gas operators to "take all reasonable precautions to avoid polluting streams, reservoirs, natural drainage ways, and underground water." This requirement is supported by a specific rule for reserve pits (Rule R615-3-16). "Salt water and oil field wastes associated with the drilling process may be disposed of by evaporation if impounded in excavated earthen reserve pits underlain by tight soil such as heavy clay or hard pan or lined in a manner acceptable to the Division." Pit liquids are not allowed to escape onto the land surface or into surface waters.

Since most of Utah has very rapid evaporation rates, the reserve pit supernatant is generally allowed to evaporate before pit closure. Final pit closure requirements were not found in the rules.

In areas of net precipitation, or in areas where pit construction is especially difficult (i.e., steep mountainsides), the Division may allow the reserve pit supernatant to be disposed of down the annulus of the new well into a properly confined zone of poor quality. This determination is made by the Division of Oil, Gas and Mining on a case-by-case basis.

The Division of Oil, Gas and Mining has extensive technical rules regarding well siting, casing requirements, and well drilling.

Production

Most produced water is injected for water flooding or for disposal. Utah has approximately 670 Class II injection wells, including about 50 active disposal wells. The Division of Oil, Gas and Mining controls injection wells and disposal facilities.

The Utah Division of Oil, Gas and Mining regulated the surface disposal of produced wastes from gas and oil wells. No pond is allowed to discharge to the surface (land or water). Construction requirements specify that pits must be protected from intrusion of surface water and must be constructed of impervious materials. Pits must be properly located in areas geologically and hydrologically suitable.

Surface disposal into unlined ponds is allowed if the wastewater contains less than 5,000 mg/L total dissolved solids and if the wastewater does not contain "objectionable or toxic levels of any constituent as shown by chemical analyses." This requirement is waived for sites discharging less than five barrels of water per day. Unlined pits must meet general requirements for proper location, operation and maintenance including geologically and hydrologically suitable, proper drainage, stability, fences, etc.

All disposal pits not meeting the criteria for unlined pits must be artifically lined.

For artificially lined pits, the Division require "an underlying gravel-filled sump and lateral system. In general, the Division feels that pit siting is more important than construction requirements.

All injection wells must be operated to prevent damage to drinking water or other resources and to confine injected fluids to the approved interval. The application for an injection well must include formation on all other wells within a half-mile area of the proposed injection well. It must also provide adequate evidence that the proposed injection pressures will not result in fracturing of the confining interval, which could enable injected or formation fluids to migrate out of that interval. Before injection begins, the operator must use a pressure test to test the casing. The test must be at 300 psi or the maximum authorized pressure (for a new well), whichever is greater, with a maximum pressure of 1,000 psi (for a converted well). Subsequent pressure tests must be administered every 5 years (except that, in lieu of pressure tests, the operator may monitor and report on the pressure in the casing-tubing annulus on a monthly basis, or use other test methods approved by the Division).

Plugging/Abandonment

No time limit is established for temporary abandonment of a well. A well is temporarily abandoned if operations have ceased, intervals open to the wellbore have been properly sealed with a cement plug or bridge plug, and there is no migration of fluids.

When plugging, cement plugs must be placed above each producing formation (100-foot length); from 50 feet below to 50 feet above the freshwater zone (or 100-foot plugs centered at the base and top of the zone); at the base of the surface casing (50-foot); and centered across the casing stub if any casing is cut and pulled (100-foot, along with a second plug the same length centered across the casing shoe of the next larger casing). At least 10 sacks of cement should be placed at the surface, completely plugging the entire hole (including all annuli, if more than one string of casing remains at the surface). Perforated intervals must be plugged with cement. Intervals between plugs must be filled with a noncorrosive fluid of adequate density to prevent migration.

References

Hunt, Gil., Letter to Ms. Susan de Nagy with attachments dated September 20, 1985.

Interstate oil Compact Commisson. The Oil and Gas Compact Bulletin, Vol. XLIV, No. 2, December 1985.

Swindle, D.B., Letter to Kerri Kennedy with attachments dated June 6, 1986.

USEPA, 1985. U.S. Environmental Protection Agency. Proceedings of the Onshore Oil and Gas State/Federal Western Workshop. December 1985. Washington D.C.: U.S. Environmental Protection Agency.

Utah Department of Natural Resources, Division of Oil, Gas and Mining, 1985. Oil and Gas Conservation General Rules, as revised, March 1989.

STATE: Virginia

AGENCIES: Department of Mines, Minerals, and Energy (DMME)
* Division of Gas and Oil (DGO)
Department of Waste Management (DWM)
State Water Control Board (SWCB)
Department of Transportation (DOT)

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - After drilling is completed, liquids in pits may be treated before being allowed to be released to the land surface.

Roadspreading - (DGO-SWCB) -

Pits - (DGO-DWM-SWCB) - General permits and standards. Drilling pits must be artificially lined. Pits not allowed for production fluid disposal.

Surface water discharge - (DGO-SWCB) - Have NPDES program delegation.

Waste haulers - (DOT) -

Burial or landfill - (DGO-DWM) - Any solids from pits are generally buried on-site.

EOR/injection wells - (DGO) - Do not have UIC primacy. There is a state program in addition to the Federal program.

BONDING: Compliance bond required. Bond conditioned on compliance with all rules and regulations, plugging, and surface restoration. Bond amount is $10,000 plugging and $2,000 restoration per well. Blanket bonds are no less than $25,000.

ENFORCEMENT: Primary enforcement is through administrative proceedings. Civil remedies, including notices of violation, closure, revocation of permit and bond forfeiture are available. No mention of criminal remedies.

COMMENTS: Waste haulers under Department of Transportation. No information given concerning standards or manifest system.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Virginia

Forms completed by: Byron T. Fulmer

Agency: Department of Mines, Minerals, & Energy (DMME)
Division of Gas & Oil (DGO)
Phone: (703) 628-8115

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DMME/DGO

Off-site disposal: DMME/DGO

(DMME/DGO - Dept. of Mines, Minerals, and Energy/Division of Gas and Oil)

*Note: The permits for disposal wells must have both a permit from the EPA and the Division of Gas and Oil.

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

The law and the policy of the Department of Mines, Minerals and Energy and the Division of Gas and Oil, is that no discharge is allowed from permitted oil and gas sites. Any direct discharge of waste would require an NPDES permit for fluid waste from the State Water Control Board. Any disposal of waste in land fills would require permits from the Department of Waste Managementj. Any disposal on-site or in an injection well would require approval from the Division of Gas and Oil.

The Department of Mines, Minerals and Energy does have cooperative agreements with the above agencies on the subject matter and exchanges information on the subject matter.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   Division of Gas and Oil - four (4) Area Inspectors and one (1) Program Tech. Annual Budget $230,000

   State Water Control Board - Advisiory Status only
   Department of Waste Management - Advisory Status only

2. Legal support;

   The Attorney General's office assigns legal council on a full time basis for the Department and the Division. Cost are billed accordingly.

3. Permitting, siting, and administration; and

   Same as for enforcement, field monitoring and inspection.

Please indicate, for each agency above, what type of training is needed for your staff.

Required training for Division of Gas and Oil Personnel:

1. Water Resources:
   a. Hydrology
   b. Geology
   c. Drilling fluid analysis
   d. Pit fluid analysis
   e. Pit fluid disposal

2. Land Resources:
   a. Site construction standards
   b. Erosion and Sediment control
   c. Revegetation
   d. Stormwater management
   e. Soils

3. Well Work:
   a. Drilling
   b. Cementing
   c. Casing
   d. Perforating
   e. Stimulation
   f. Workover
   g. Production facilities

4. Safety:
   a. Personnel safety
   b. Site safety
   c. H2S
   d. Blow-out prevention
   e. First-Aid
   f. Explosive safety

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

	Disposal on-site	Disposal off-site
a. Landfarming		
b. Roadspreading	DGO	DGO, SWCB
c. Pits	DGO	DGO, SWCB, DWM
d. Surface water disposal	DGO	DGO, SWCB
e. Waste haulers		DOT
f. Burial or landfill	DGO	DWM
g. Disposal wells	DGO, EPA	DGO, EPA
h. Enhanced oil recovery injection wells	DGO, EPA	DGO, EPA

(DGO - Division of Gas & Oil)
(SWCB - State Water Control Board)
(DOT - Dept. of Transportation)
(DWM - Dept. of Waste Management)

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

	Disposal on-site	Disposal off-site
a. Safe Drinking Water Act (UIC)	The State of Virginia does not implement the UIC program in Virginia under the EPA; however, it does implement a state program which requires a permit for Class II wells within the Division of Gas and Oil.	
b. Clean Water Act (NPDES)	The State Water Control Board implements the NPDES program for all discharges other than from coal operations. As stated, the policy of the Department of Mines, Minerals and Energy is that of no-discharge. If discharge is desired, the operator would have to obtain a permit from the State Water Control Board.	
c. Resource Conservation & Recovery Act (RCRA)		
Subpart C (Hazardous)	DWM Dept. of Emergency Services	DWM Dept. of Emergency Services
Subpart D (Non-Hazardous)	DMME/DGO	DMME/DGO

*Note: Different agencies enforce or have adopted some parts of the RCRA

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Currently the operator of a permit must post surety acceptable to the Director of the Division of Gas and Oil for the drilling and production of the well and for the life of the well. The amounts range from $10,000 per well to an amount of not less than $25,000 for several wells. No special liability insurance is required for disposal of waste other than the required posted bond.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

In general, each agency has different procedures for the enforcement of its duties and responsiblities under the law to which they administer. The Division of Gas and Oil has an enforcement policy which is administered by the Inspectors. The Virginia Oil and Gas Act allows for the disposition of enforcement to be reviewed by an administrative Board. Once administrative appeals have been properly disposed, the agency can, and if required, proceed with the disposition of the violation through the judicial system. The main level of enforcement is the Division of Gas and Oil.

Please list the types of enforcement actions available?

Notice of Violation; Notice of Closure; Show Cause/Revocation of Permit; Bond Forfeiture; Litigation

VIRGINIA

INTRODUCTION

Virginia produced 24,952 barrels of oil from 28 oil wells and 26 gas-condensate wells and 18,682,530 MCF of gas from 728 wells in 1988.

REGULATORY AGENCIES

One agency principally regulates oil and gas activities in Virginia:

* Virginia Department of Mines, Minerals and Energy/Division of Gas and Oil.

The Division of Gas and Oil is governed by the Virginia Oil and Gas Act and regulation promulgated thereunder the Well Review Board, Oil and Gas Conservation Board and the Chief of the Division of Mines. Current Rules and Regulations were issued by the Virginia Department of Labor and Industry in 1983. In 1985, a reorganization of the State government created the Department of Mines, Minerals and Energy (DMME). This resulted in the shift of the Division of Mines and Quarries from the Department of Labor and Energy to the Department of Mines, Minerals and Energy. The Division was renamed the Division of Mines. In 1987, DMME realigned the Division of Mines responsibilities for quarries and oil and gas, and established the Division of Mineral Mining and the Division of Gas and Oil. The Division of Gas and Oil issues drilling permits and regulates the details of the industry through this process. The States does not have primacy for the UIC program Class II wells, but no underground injection of fluids is currently associated with the Virginia industry. There has been drilling on Federal lands, but such lands are owned the the National Forest Service, and the Service serves as another surface landowner is such drilling activity. The Service would manage its concerns principally through the surface lease process. The Virginia State Water Control Board would become involved only in the event of and incident that potentially could affect surface water quality.

STATE RULES AND REGULATIONS

Drilling

All disturbance to the land associated with the development of the drilling site, including the construction of pits, pipelines and access roads, must comply with standards set down in the Virginia Soil and Erosion Control Handbook.

Pits associated with the drilling of a well must be constructed to prevent fluid discharge to surface or groundwater. It is the policy of the Division of Gas and Oil that drilling pits must be lined with a plastic liner. After drilling is complete, liquids in the pit may be treaed, for ph, oil and grease, total suspended solids, manganese and iron to standards established by the Department of Mines, Minerals and Energy before allowed to be released for land application. Solids may be buried at the site or applied at the site. The drillsite, access road and pits must be reclaimed within 1 year after drilling is completed.

In general, there is little fluid associated with the drilling process in Virginia. Such fluids as may be present are not high in chloride concentration. Generally, the fluid is tested and adjusted as required and land applied. Any solids from the pit is spread and buried at the site and reclaimed.

Production

No pit may be used for the ultimate disposal of salt water (Part III, Regulation 3.09 (e)). Salt water must be periodically drained or removed, or properly disposed of from any pit in which it is retained.

Almost no fluid is associated with gas production in Virginia. Very small amounts of fluids are produced in association with oil production. As a result, produced fluids are held in steel tanks, which are surrounded by dikes (1 1/2 X the capacity of the tank). The fluids are then allowed to evaporate within the dike.

Offsite Disposal

No use is made of commercial pits in Virginia.

Plugging/Abandonment

Under the Virginia Oil and Gas Act, operators are required to immediately plug a well "upon the abandonment or cessation of operations" of that well. Where there is good economic cause, however, gas wells may be capped for an indefinite period after approval from the Division has been granted.

Different plugging requirements exist for wells, depending on whether they penetrate coal seams and, if they do, whether with or without coal protection string. Cement plugs are required 20 feet above each oil, gas or water-bearing stratum and 10 feet below the bottom of the largest casing left in the well. All plugging procedures must be approved prior to the plugging of the well. Mud, clay, or another approved nonporous material is used to fill all spaces in the well not filled by plugs. Additional requirements are made for perforations that cannot be readily filled by the above methods and for the protection of coal seams.

References

Interstate Oil and Gas Commission. 1986. Summary of State statutes and regulations for oil and gas production. June 1986.

Interstate Oil Compact Commission. 1985. The Oil and Gas Compact Bulletin. June 1985.

Personal Communications:

William Edwards, Department of Mines, Minerals and Energy (804) 257-0330.

James Henderson, State Oil and Gas Inspector (703) 628-8115.

STATE: West Virginia

AGENCIES: Department of Commerce, Labor and Environmental Resources (DCLER)
Department of Energy

MOU:

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DCLER) - General permit for land application of treated drilling and workover fluids.
Roadspreading - (DCLER) -
Pits - (DCLER) - Permit required. No liner requirement, however, in certain areas impervious natural materials must be added.
Surface water discharge - (DCLER) - Prohibited.
Waste haulers - (DCLER) -
Burial or landfill - (DCLER) - Drill cuttings must be buried on-site.
EOR/injection wells - (DCLER) - UIC primacy state. Some production fluids reinjected into producing horizons.

BONDING: Compliance bond required. Bond is for the life of the well. Bond amount is $10,000 per well or $50,000 blanket bond.

ENFORCEMENT: Administrative remedies, civil penalties, permit denial and bond forfeiture are available. No indication regarding criminal enforcement.

COMMENTS: No information on formal coordination mechanism between agencies.

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: West Virginia

Forms completed by: Ted M. Streit

Agency: Dept. of Commerce, Labor and Environmental Resources (DCLER)
Phone: (304) 348-3741

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: DCLER

Off-site disposal: DCLER

(DCLER - Dept. of Commerce, Labor and Environmental Resources)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

West Virginia is presently consolidating its Oil and Gas regulatory agencies into one agency, the Oil and Gas Section of the Department of Commerce, Labor and Environmental Resources.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   18 positions

2. Legal support;

   One (1) position (included in enforcement budget)

3. Permitting, siting, and administration; and

   12 positions

Please indicate, for each agency above, what type of training is needed for your staff.

1) Enforcement

3) Permitting - Review of Federal Regulations and Problem resolution with spills, environmental damage

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	} Oil & Gas Section of Dept. of Commerce, Labor and Environmental Resources	
b.	Roadspreading	}	
c.	Pits	}	
d.	Surface water disposal	}	
e.	Waste haulers	}	
f.	Burial or landfill	}	
g.	Disposal wells	}	
h.	Enhanced oil recovery injection wells	}	

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	} Oil & Gas Section of Dept. of Commerce, Labor and Environmental Resources	
b.	Clean Water Act (NPDES)	}	
c.	Resource Conservation & Recovery Act (RCRA)	}	
	Subpart C (Hazardous)	}	
	Subpart D (Non-Hazardous)	}	

3. List any financial assurance requirements for oil and gas exploration and production wastes:

Single bonds per well of $10,000
Blanket bonds - all wells per operator $50,000

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

West Virginia Oil & Gas has in place a comprehensive enforcement plan that has numerous administrative remedys, from civil assessments, permit denial & revocations, to bond forfeiture.

Please list the types of enforcement actions available?

WEST VIRGINIA

INTRODUCTION

West Virginia produces about 3.6 million barrels of oil and 7.5 BCF of gas per year from 15,895 wells. Gas production of 142.5 billion cubic feet annually is realized from 32,500 gas wells. Between 1,800 and 2,500 drilling permits are issued annually, although the number of wells drilled dropped in 1986.

REGULATORY AGENCIES

Two agencies now regulate oil and gas activities in West Virginia:

* West Virginia Department of Commerce, Labor and Environmental Resources, Oil and Gas Section; and
* U.S. Bureau of Land Management.

The West Virginia Energy Act, passed on April 12, 1985, created the West Virginia Department of Energy, which was included in the newly created West Virginia Department of Commerce, Labor and Environmental Resources, and vested in the Department jurisdiction over oil and gas activities in the State. The Department has assumed the responsibilities previously carried out by the Department of Mines, Office of Oil and Gas, and is in the process of assuming relevant program responsibilities from the Division of Natural Resources, Water Resources Section. Among the programs that are to be transferred, after approval by EPA, are those aspects of the delegated NPDES, underground injection, and hazardous waste programs that bear on oil and gas exploration, development, and production. Pending redelegation by EPA, the Division of Natural Resources is still the lead agency for the activities, and the Division of Natural Resources and the Division of Energy are cooperating on the environmental regulation and oversight of the oil and gas production industry.

Within the Division of Energy, the Section of Oil and Gas has responsibility for the regulation of the State's oil and gas industry. The Section has new regulations that have been approved by the State legislature. The regulations went into effect June 12, 1987. The regulatory requirements summarized below describe these rules.

The U.S. Bureau of Land Management has jurisdiction over lease arrangements and post-lease activity on Federal lands. Their rules are discussed in a separate section on Federal agencies, Volume 1, Chapter VII. The U.S. Forest Service retains surface rights for Federal forests and grasslands. The Service coordinates surface stipulations with the Bureau of Land Management where applicable.

STATE RULES AND REGULATIONS

Drilling

Pit Construction/Management

Each pit used for drilling wastes is subject to the terms of a general West Virginia permit for construction, management, and discharge.

Pits must be constructed to "prevent seepage, leakage or overflows" and maintain integrity. If an operator is unable to maintain adequate freeboard to prevent overflows, an additional pit must be built. There is no liner requirement, but there is a stipulation that where the soil "is not suitable to prevent seepage or leakage, other materials which are impervious shall be used as a liner for a pit." Unlined dikes must be free of large rocks, trees, or other growth that could damage the pit's integrity.

During operation of the pit, it is prohibited to dump into the pit production brine, unused fracturing fluid or acid, compressor oil, refuse, diesel, kerosene, halogenated phenol, or drilling additives prepared in diesel or kerosene.

Pit Closure

Pits are to be filled within 6 months after the cessation of drilling. The drill cuttings may be buried onsite, after disposal of liquids.

Disposal

Treated wastewaters generated during drilling, reworking, and treatment of wells may be discharged for land application onsite, subject to the following limitations:

pH	6.0 - 10.0
Total iron	6 mg/L
Chloride	12,000 mg/L
Free or floating oil	no visible sheen on land.

In addition, monitoring is required for TSS. dissolved oxygen, manganese, conductivity, settleable solids, and total organic carbon.

Required treatment includes pH adjustment, aeration, and extending settling for at least 10 days. Free or floating oil should be skimmed off and removed from the pit before treatment and, if observed, before discharge. Land application should not be carried out on saturated, frozen, impermeable, or unvegetated land, and must be at a rate that will not cause ponding or erosion. To prevent the discharge of sludge, there must be a discharge device on the pit that ensures that the discharge will be from near the surface of the pit water level.

Discharge onto property off the drilling site require both a permit and the permission of the landowner.

Produced Waters

The Division of Energy regulations, beyond prohibiting the placement of produced salt water in drilling pits, specify that when such water is produced it must be "contained in sump pits no larger than necessary for the purpose." There is no general permit for land discharge of salt water, and discharge into waters of the State is prohibited. Salt water may be injected into Class II wells. (For figures on actual disposal patterns, see the section on current management practices, Volume 1, Chapter III.) There is no prohibition against use of brines on roads, although research is currently underway on this possibility.

Injection

Class II injection wells are permitted for both enhanced recovery (529 wells) and disposal (53 wells).

Injection should be through a tubing and packer arrangement, with the packer set immediately above the injection zone. The annulus must be monitored by a pressure-sensitive device. Injection pressure must be regulated to minimize the possibility of fracturing the confining strata. "Disposal into the same formation from which the water is produced is preferable."

Mechanical integrity tests for injection wells are made at one and one-half to two times the injection pressure for 20 minutes, with a 5 percent allowable variance.

Offsite Disposal

Wastes may be transported offsite to appropriate disposal facilities. If these facilities discharge wastes after treatment, they must be separately permitted.

Plugging/Abandonment

Wells completed as dry holes, or wells not in use for a period of 12 months, are presumed abandoned and must be "promptly" plugged, unless the operator can prove "bona fide future use."

Cement plugs (of unspecified length) shall be set 20 feet above each oil, gas, or water-bearing stratum (except that if such strata are not widely separated and are free from water, they may be treated as a single stratum). A final plug must be placed 10 feet below the bottom of the largest casing in the well. Mud, clay, or other nonporus material is to fill all space in the well from the bottom of the well (or from a permanent bridge anchored 30 feet below the lowest stratum) to the lowest plug, between each of the plugs, and from the highest plug to the surface. Unfillable cavities created when straa were perforated should be isolated by plugs placed 20 feet above and below the stratum, or a liner should be placed from at least 20 feet above to 20 feet below the stratum and filled with cement.

Special additional requirements (e.g., use of expanding rather than hydraulic cement, and more cement plugs) are imposed to protect workable coal beds.

References

Interstate Oil and Gas Compact Commission. History of production statistics, production and reserves 1966 - 1985.

Streit, T.M., Letter submitted to William A. Telliard, U.S. EPA, May 28, 1985.

USEPA. 1985. U.S. Environmental Protection Agency. West Virginia Meeting Report. Proceedings of the Onshore Oil and Gas Workshop March 26-27 in Atlanta, Ga., Washington D.C.: U.S. Environmental Protection Agency.

West Virginia Department of Energy. Notice of public hearing and comment period on proposed rules. Not dated. Received October 1986.

West Virginia Legislative Rule, Department of Energy - Division of Oil and Gas, Chapters 22-1 and 22B-1, 38 CSR-11 thru 19.

West Virginia General Permit for Discharge of Drilling Wastes.

Personal Communications:

John Johnston, Oil and Gas Division, West Virginia Department of Energy (304) 348-3741.

Ron Shipley, West Virginia Department of Natural Resources (304) 348-2754.

Ted Streit, former head of Office of Oil and Gas, September 25, 1986.

STATE: Wyoming

AGENCIES: Oil and Gas Conservation Commission (OGCC)
Department of Environmental Quality (DEQ)
U.S. Bureau of Land Management (BLM)

MOU: Yes

TECHNICAL SUMMARY/RESPONSIBLE STATE AGENCY:

Landfarming - (DEQ) - Drilling fluids may be applied to the land one time after approval by permit.

Roadspreading - (DEQ) - Drilling fluids may be applied to road surfaces after approval by permit.

Pits - (OGCC-DEQ-BLM) - Pits are authorized by rule and as part of drilling permit. Liners generally are not required. Drilling pits must be closed within 1 year. Produced water disposal pits must be under permit. Liners generally not required. Centralized and commercial disposal pits are authorized.

Surface water discharge - (OGCC-DEQ-BLM) - Surface water discharges authorized under the BPT Wildlife and Agricultural Use Subcategory. Permitted as disposal method for approximately 30% of produced water.

Waste haulers -

Burial or landfill - (OGCC-DEQ-BLM) - Drill cuttings are buried in pits on site.

EOR/injection wells - (OGCC-DEQ) - Delegated Class II program. Approximately 63% of produced fluids are injected.

BONDING: Compliance bond required, in the form of surety bonds, letters of credit, certificates of deposit, or cash. Bond is conditioned on drilling, plugging and surface restoration. Bond amount depends on well depth, and ranges from $5,000 to $10,000 per well. Blanket bonds are $25,000.

ENFORCEMENT: Enforcement actions include various administrative proceedings, including well shut-in, hearings on complaints before the Commission, civil penalties, and bond forfeiture. Civil and criminal remedies available.

COMMENTS:

SURVEY OF WASTE MANAGEMENT
IN OIL AND GAS EXPLORATION AND PRODUCTION OPERATIONS

State: Wyoming

Forms completed by: Donald B. Basko

Agency: Wyoming Oil & Gas Conservation Commission (OGCC)
Phone: (307) 234-7147

NOTE: If enough room has not been allotted to fully answer a question, please attach additional pages. Please coordinate your state's response from all agencies into a single response.

Send your response by September 1, 1989 to:

Jerry Simmons
Interstate Oil Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127

General Information

A. List regulatory agencies with jurisdiction over disposal of oil and gas wastes from exploration and production operations:

On-site disposal: OGCC
BLM

Off-site disposal: DEQ

(OGCC - Wyoming Oil & Gas Conservation Commission)
(DEQ - Dept. of Environmental Quality)
(BLM - Bureau of Land Management)

B. If item A above lists multiple agencies with dual jurisdiction, identify the lead agency and the mechanism in place (e.g., memorandum of agreement, cooperative agreement or legislatively mandated) to eliminate duplication of efforts and for cooperation.

Wyoming Oil & Gas Conservation Commission and Bureau of Land Management - no lead agency. Wyoming Oil & Gas Conservation Commission regulates activities on fee and state leases; Bureau of Land Management on federal leases - cooperative agreement.

Wyoming Oil & Gas Conservation Commission and Department of Environmental Quality - jurisdiction has been legislatively mandated and further clarified by memorandums of agreement.

Do you have any flow charts, or a matrix or an organizational chart that shows the relationship among the agencies that have been listed? If yes, would you please provide a copy of the charts and/or matrix.

No

C. Please provide, for each agency, the number of staff involved in and the amount of money budgeted for:

1. Enforcement, field monitoring and inspection;

   Wyoming Oil & Gas Conservation Commission
   Staff: 3 Budgeted: $121,552.00 Information is not available for the DEQ.

2. Legal support;

   Wyoming Oil & Gas Conservation Commission
   Staff: 1 Budgeted: $18,000.00 Information is not available for the DEQ.

3. Permitting, siting, and administration; and

   Wyoming Oil & Gas Conservation Commission
   Staff: 3 Budgeted: $131,778.00 Information is not available for the DEQ.

Please indicate, for each agency above, what type of training is needed for your staff.

Environmental Protection Courses - Wyoming Oil & Gas Conservation Commission
Groundwater & Well Technology Courses - Wyoming Oil & Gas Conservation Commission
Groundwater Contamination Courses - Wyoming Oil & Gas Conservation Commission

This information is not available for the Department of Environmental Quality.

D. Attached is a copy of information prepared by the U. S. Environmental Protection Agency for your state for their 1988 report to congress. Is this information still current?
___yes _X_no. If no, please revise and submit with this survey.

1. WHAT AGENCY REGULATES:

		Disposal on-site	Disposal off-site
a.	Landfarming	DEQ	DEQ
b.	Roadspreading	DEQ	DEQ
c.	Pits	OGCC, BLM & DEQ	DEQ
d.	Surface water disposal	OGCC, BLM & DEQ	DEQ
e.	Waste haulers		
f.	Burial or landfill	OGCC, BLM & DEQ	DEQ
g.	Disposal wells	OGCC, BLM & DEQ	
h.	Enhanced oil recovery injection wells	OGCC, BLM	

2. What state agency has jurisdiction over implementation of federal laws with regard to exploration and production waste within the state:

		Disposal on-site	Disposal off-site
a.	Safe Drinking Water Act (UIC)	OGCC, DEQ	
b.	Clean Water Act (NPDES)	DEQ	
c.	Resource Conservation & Recovery Act (RCRA)		
	Subpart C (Hazardous)		
	Subpart D (Non-Hazardous)	DEQ	

3. List any financial assurance requirements for oil and gas exploration and production wastes:

OGCC

$5,000 individual bond for wells less than 2,000 feet in depth.
$10,000 individual bond for wells greater than 2,000 feet in depth.
$25,000 blanket bond
Letters of credit accepted at the Commission's discretion. They have to be issued by a Wyoming bank, be irrevocable and of unlimited duration. Payment on claim has to be immediate. A bank refusing payment is subject to criminal penalties.
Cash bonds or certificates of deposit issued by a state bank.

DEQ

Statutory financial assurance requirement for hazardous waste injection wells.
No bonding requirement for commercial, non-hazardous Class I wells.
Solid waste operations have to demonstrate financial assurance for trash pits, land farmikng, for new facilities, but not for existing (they'll be promulgated this fall).

Commercial oil and gas waste facilities have to have a bond.

4. Organization and Coordination:

Enforcement actions: Please indicate, for each of the agencies you have listed, whether the agency initiates enforcement actions through administrative proceedings, or whether the attorney general initiates administrative actions and court proceedings. Are there memorandums of understanding, agreements, or policies that affect the enforcement process? Would you please explain and provide a copy of the policy or agreement?

Both agencies initiate actions through administrative proceedings.

Please list the types of enforcement actions available?

Well shut in, hearing of complaint before the Commission, levying of civil penalties in form of fines and/or imprisonment, and bond revocation.

WYOMING

INTRODUCTION

Wyoming produced 130,984,917 barrels of oil and 597,896,000 MCF of gas in 1985. Production is from 12,218 oil wells and 2,220 gas wells.

Fifth-two percent of the State's oil production is produced from the 20 largest fields. Twelve of those fields are 58 years old or older. Oil, water, and gas have always been produced from these areas. The produced water historically has been reinjected, evaporated in pits, or discharged into drainages.

REGULATORY AGENCIES

Three agencies regulate oil and gas activity in Wyoming:

* Wyoming Oil and Gas Conservation Commission;
* Wyoming Department of Environmental Quality; and
* U.S. Bureau of Land Management.

The Wyoming Oil and Gas Conservation Commission has general authority overl all oil and gas production in Wyoming, and the specific responsibility to "monitor and regulate, by the promulgation of rules and the issuance of orders, the location, operation, and reclamation of produced water and emergency overflow pits associated with oil and gas production." The Commission regulates industry practices and procedures with regard to construction, location, and operation of drilling and production pits, both onsite and offsite. The Oil and Gas Conservation Commission is chaired by the Governor of Wyoming; four other commissioners serve with the Governor. The Office of the State Oil and Gas Supervisor is primarily responsible for regulation of industry practices.

Wyoming is an NPDES-delegated State. The Wyoming Department of Environmental Quality has NPDES authority for all discharges. DEQ also has responsibility for permitting the construction, maintenance, and operation of commercial pits. In addition, DEQ has authority for the land application of all types of exploration and production wastes.

The specific division of roles between the Wyoming Oil and Gas Conservation Commission and the Department of Environmental Quality was previously defined by a "Memorandum of Agreement" (MOA) of September 13, 1983; a memorandum from the Attorney General's office on January 18, 1982; and an MOA dated October 14, 1981.

However, the 1987 session of the Wyoming State Legislature passed a bill creating a new section in the Wyoming Oil and Gas Conservation Commission Act. The new legislation gives the Commission exclusive authority over all noncommercial oil field pits on a lease, unit, or communitized area (except for discharges from such pits subject to NPDES permitting). See §30-5-104(d)(VI)(A) and (B).

The Bureau of Land Management (BLM) has jurisdiction over drilling and production on Federal lands. For drilling on Federal land, BLM handles all Applications to Drill. BLM requires extensive environmental documentation, including environmental assessments, and develops environmental impact statements. For produced water, BLM routinely approves discharges of up to 5 barrels/day under NTL-2B. For further discussion of the rules and procedures of BLM, see the section on Federal regulations, Volume 1, Chapter VII.

STATE RULES AND REGULATIONS

Drilling

Pit Construction/Management

Earthen pits are required to be constructed to prevent pollution of streams or underground water, or unreasonable damage to the surface of leased premises or other lands. The rules do not require pit or pond liners, leak detection, or other modifications to a simple earthen pit except where "potential for communication between the pit contents and surface water or shallow ground water is high." Each pit application is reviewed before approval, taking into consideration a wide variety of factors including the soil type on which a proposed pit is to be constructed. Quality of the contained water, especially the TDS level, is also an important consideration. The State Supervisor makes this determination based on the information presented in the permit application form. Use of chemicals that destroy, remove, or reduce the fluid seal of a reserve pit is prohibited. Chemical or mechanical treatment of reserve pits may be specially allowed after a public hearing before the Oil and Gas Conservation Commission.

Workover and completion pits are exempted from permit requirements if their use is limited to containment of oil and/or water and they do not contain acids or other chemical fluids. There is no requirement in the regulations for segregation of drilling muds, produced waters, or other wastes associated with drilling or production, but this requirement is made as a stipulation of approval of the pit application. Practices tend to vary significantly with the operator.

Pit Closure

Reserve pits must be reclaimed within a year of last use, unless the Supervisor grants a variance. After evaporation, discharge or hauling of the liquid material in the pit, the drill cuttings are buried onsite and the land is rehabilitated in accordance with the landowner's wishes. Bonds guaranteeing plugging of the well and pit reclamation are not released until the Commission has inspected and approved the reclaimed pit and drillsite.

Discharge

Drilling fluids from reserve pits may be evaporated, applied to road surfaces, applied to land other than road surfaces, or hauled to a central disposal facility.

Section 326 of the rules of the Oil and Gas Conservation Commission states: "A permit may be allowed by DEQ for one time land application of drilling fluids. At no time will drilling fluids be discharged into live waters or into any drainages that lead to live waters of the state." Section 11(a) of Chapter VII of the regulations of the Department of Environmental Quality (DEQ) establishes a no-discharge rule for "drilling muds and other liquids associated with the drilling of oil and/or gas wells." Section 11(b), however, allows exceptions where the operator has provided a complete analysis of the drilling liquid, the volume and location of discharge, and the name of the receiving water; DEQ has determined that the discharge would not cause significant environmental damage or contamination of public water supplies; and the landowner has agreed.

During the period of 1983 to 1985, DEQ approved 21 permits for application of drilling fluids to roads. The State currently lacks specific road permit standards or numeric criteria. Information is required on pH, conductivity, and TDS contents of the wastes. Actual concentrations of TDS in permits approved for road application of drilling fluids during the above period varied from a few hundred to 10,000 mg/L. A DEQ memorandum notes several criteria established in such permits. Those that apply to drilling fluids include: limitation of application rates to those specified in the permit; application to avoid runoff or ponding; no application on slopes exceeding 8 percent, within 300 feet of definable high water marks of drainages, irrigation canals, lakes or reservoirs, or when the soil is saturated; and landowner approval.

During the same 1983 to 1985 period, DEQ issued 16 permits for drilling fluids to be applied to land other than roads. Such permits require that the fluids meet the criteria established in Chapter XI, Section 55(c)(ii), Part E for irrigation water quality, including;

Total dissolved solids	2,100 mg/L
Chlorides	1,500 mg/L
Oil and Grease	20,000 lb/acre, when soil incorporated (surface 6 inches); 2,000 lb/acre when surface applied
Sulfates	960 mg/L
Boron	2 mg/L
Arsenic	0.1 mg/L
Chromium	1 mg/L
Selenium	0.2 mg/L
Nickel	0.2 mg/L
Zinc	2 mg/L
Copper	1 mg/L
Bicarbonates	<50% of total anion concentration mg/L
pH	4.5 - 9.0

Produced Waters

Produced waters are disposed of through injection for enhanced recovery (approximately 63 percent), surface water discharge (approximately 30 percent), injection into disposal wells, discharge into centralized disposal pits, discharge into commercial disposal pits, or road application.

Disposal/Storage Pits

The Oil and Gas Conservation Commission has jurisdiction over the permitting, construction, and management of all produced water pits on private and State lands. The Commission requires permits for all pits. However, such permits include requirement for liners only in special cases where "potential for communication between the pit contents and surface water or shallow ground water is high." The Commission may administratively approve field wide or area wide applications covering earthen retaining pit construction and operation.

Pits must be kept reasonable clear of surface accumulations of oil or other liquid hydrocarbons, and the accumulations must be cleaned within 10 days of discovery. Pits must be fenced when near human habitation or sensitive areas for wildlife or domestic stock and must be flagged as required.

Surface Discharge

The Wyoming Department of Environmental Quality's Water Quality Rules and Regulations, Chapter VII, describe the rules for discharges of produced water that could enter surface waters, as permitted by EPA's Agricultural and Wildlife Water Use Subcategory. Discharge of produced water may be permitted if the following effluent limitations are met:

Chlorides	2,000 mg/L
Sulfates	3,000 mg/L
Total dissolved solids	5,000 mg/L
pH	6.5 - 8.5
Oil and grease	10 mg/L.

There is also a general prohibition on discharges containing toxic substances in concentrations or combinations toxic to human, animal, or aquatic life.

During 1983 to 1985, five permits were issued by DEQ for road application of produced waters. Road applications will be considered for water over 5,000 mg/l.

Injection

The Wyoming Oil and Gas Conservation Commission has delegated responsibility for the UIC Class II program and issues permit for both enhanced recovery (4,548 wells) and noncommercial disposal (196 wells). Disposal wells permitted by the Commission meet the permitting requirements of Chapter IX, Wyoming Water Quality Rules and Regulations. For both types of well, the applicant has the burden of demonstrating at a public hearing that the injection or disposal zones is not a source of drinking water and by certain criteria can be exempt from protection as fresh and potable water. The applicant must also supply an application for approval of use of the well for injection, which includes the following points:

1. Proof that the well is cased and cemented in such a way that fluids are prevented from entering any zone but that exempt;

2. Evidence and data to demonstrate that operation of the well at the proposed maximum injection pressure with proposed volumes will not initiate fractures through the confining zone;

3. A statement detailing procedures for pressure testing the casing in the well prior to any use;

4. A plat showing the location of all wells within a one-quarter mile radius of the proposed injection or disposal well and a statement relative to the mechanical condition or abandonment of each;

5. An affidavit showing that all surface owners and owners of interest within a one-half mile radius of the well have been provided notice of the proposal; and

6. A geologic description of the reservoir that will receive the fluids, which includes its areal extent.

The surface casing must be run to reach a depth below all known or reasonably estimated utilizable domestic freshwater levels. The surface casing should be cemented with sufficient cement to fill the annulus to the top of the hole.

Before beginning injection, and at least once every subsequent 5-year period, the operator must test the well's mechanical integrity. In a new well, the casing outside the tubing must be tested at a pressure not less than the maximum authorized injection pressure, or at 300 psi, whichever is greater. In a converted well, the test must be at the lessor of 1,000 psi or the maximum authorized injection pressure, but no less than 300 psi. A retrievable bridge plug or approved logging technique will be used in casing to test tubingless completions.

Offsite Disposal

The Department of Environmental Quality permits the construction of commercial pits. Chapter III of the Wyoming Water Quality Rules and Regulations establishes permit processing and application requirements. Minimum standards for pits and wells are established in Chapter XI. The operator must demonstrate that the facility will not allow a discharge to ground water by direct or indirect discharge, percolation, or filtration; that the quality of the wastewater will not cause a violation of ground-water standards; or that existing soils or geology will not allow a discharge to ground water. If the applicant cannot demonstrate any of these alternatives, the operator may conduct a subsurface investigation and develop a design to prevent violation of ground-water standards. These designs may consist of leachate collection systems, barriers with a pumpback system, attenuation, or aquifer cleanup after completion of the operation. DEQ may require a monitoring program for such facilities.

At the present time, 11 facilities are authorized to receive drilling fluids and produced water, and an additional 11 are authorized to receive produced water only.

Plugging/Abandonment

A well may be temporarily abandoned so long as the hole is cased or left in such a manner as to prevent migration of oil, gas, water, or other substances from the formations or horizons of origin. Monthly reports must be submitted to the Commission, and bonding requirements are kept in force until the well is permanently abandoned. There are no restrictions on the time period for which the well may retain such status; however, specific approval must be obtained from the Wyoming Oil and Gas Conservation Commission if a well is temporarily abandoned for more than 1 year. Temporarily abandoned injection wells must meet the 5-year testing requirements of the UIC program.

When wells are plugged, cement plugs of at least 100 feet must be placed over open hole porous and permeable formations (or every 2,500 feet in lieu of such formations), over the stub of the casing left in the wellbore, and in the base of the surface casing. Cast iron bridge plugs set in the casing will be capped with at least two sacks of cement. Open perforations must be squeeze-cemented.

References

Wyoming Department of Environmental Quality. Water Quality Rules and Regulations, Chapters III, VII, IX, XI.

Rules and regulations of Wyoming Oil and Gas Conservation Commission. (January 1, 1985) Memorandum of Agreement between the Wyoming Oil and Gas Conservation Commission and the Department of Environmental Quality, Water Quality Division, September 12, 1983.

Personal Communication:

E.J. Fanning, Department of Environmental Quality, Water Quality Division, August 11 and August 14, 1986, and March 6, 1987. (307) 777-7781.

Janie Nelson, Wyoming Oil and Gas Conservation Commission, August 14, 1986. (307) 234-7147.

APPENDIX C

ADDRESSES FOR COUNCIL MEMBERS, ADVISORS, AND OBSERVERS

ADDRESSES FOR COUNCIL MEMBERS, ADVISORS, AND FEDERAL OBSERVERS

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APPENDIX D

MINORITY REPORT TO THE COUNCIL ON REGULATORY NEEDS

This minority report was submitted to enumerate views not agreed to by a majority of the Council. The IOCC approved the majority report prior to the submission of this minority report and neither accepts or rejects its content.

MINORITY REPORT TO THE COUNCIL ON REGULATORY NEEDS

Philip M. Hocker, Mineral Policy Center
Patti J. Saunders, Alaska Center for the Environment
Chris Shuey, Southwest Research and Information Center

September, 1990

We appreciate the opportunity to communicate to the IOCC Council on Regulatory Needs and to Governors Sinner and Carruthers our observations about the Council's *Report on Technical and Administrative Criteria for Oil and Gas Exploration and Production Wastes*. We offer this minority report and the comments and concerns it contains in the same spirit of cooperation and good faith that we brought to our participation as advisors during the past 20 months.

Dialogue among regulatory agencies, the industry, public-interest groups and affected citizens is always necessary on issues as important as those involving public health and the environment. Communication and interaction are especially critical when the discussion centers around regulating oil and gas production wastes, the largest category of solid and liquid wastes in the nation. We gained considerable insight into the complexity of the issues faced by the states, the industry and EPA as a result of participating in the Council's work. For those reasons, we appreciate having been invited by IOCC to be involved in this process.

Those states that take seriously the charge of improving their E&P waste regulatory programs will find several useful elements in the Council's *Report*. First, they will be able to use the State Summaries in Appendix B (section 1.5) to cross-reference their requirements for specific waste management practices with those in neighboring states. Second, they will gain insight from the *Report's* definitions of solid waste and hazardous waste, its discussion of EPA's mixture rule, and its lists of wastes that are exempt and not exempt from RCRA Subtitle C, as determined by EPA (section 2.4 through 2.9). Third, the range of compliance and enforcement options (section 4.1.2. and 4.1.3.) will help states improve the implementation and enforcement of their programs. Fourth, the states will gain some measure of understanding of the importance of providing legitimate opportunities for public participation in agency regulatory programs (section 4.2.2.). Fifth, waste hauler certification (section 4.2.4.) and waste tracking (sections 4.2.5. and 5.7.2.3.) criteria were deemed to be appropriate requirements for state programs. And sixth, the hierarchy of preference for waste management (section 5.1.e.) provides a vital framework for state-level decision making on waste management options.

Notwithstanding the potential usefulness of the *Report*, we have concluded that the document is essentially a restatement of the status quo, a reaffirmation by the states of practices they already allow regardless of whether those practices are protective of public health and the environment. The Council did not move the participants to write a report that suggested the best possible regulatory programs--a set of guidelines that would move both the states and the industry forward. Instead, the *Report* is further justification for continued minimal action. In conjunction with our recent rereading of the damage cases in the *Report to Congress*[1], the Council's effort simply convinces us even more of the need for a stringent federal regulatory program for E&P wastes.

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[1]U.S. Environmental Protection Agency. Report to Congress--Management of Wastes from the Exploration, Development, and Production of Crude Oil, Natural Gas, and Geothermal Energy. Office of Solid Waste and Emergency Response (Washington, D.C.), December 1987.

The Council Report is inadequate, in part, because the environmental/citizens's group viewpoint was not given sufficient representation in the Council's structure. Of the 10 individuals who served as advisors, five in effect represented the concerns of industry, three (ourselves) represented public interest/environmental concerns, and two represented state governments. Additionally, two industry representatives participated as official observers; no other representative or member of a citizen's group or environmental organization was, to our knowledge, invited to participate as an observer. Better representation of our view was needed not only for balance and fairness, but also to reflect the public's growing concerns about the management of oil and gas wastes and the negative impacts they have left in so many communities in the nation.

We disagree with the contention that observers from EPA brought opinions and views that parallel those we hold. With all due respect to our colleagues at EPA, we did not agree (and still don't) with findings the agency made in the oil and gas regulatory determination,[2] as evidenced by the lawsuit that ACE, SRIC and others brought against EPA in late 1988. We continue to believe firmly that oil and gas wastes should be regulated consistent with past federal policy for other toxic wastes, that is, solely on the basis of their toxicity and hazards. And we intend to press that point with Congress during the reauthorization of RCRA.

We also disagree that the states' views were balanced between the environmental and the oil and gas administrators. During the process, we observed that the common interest of the states was to protect the exclusivity of the states' regulatory authorities in the oil and gas waste arena. That common interest was shared equally throughout the ranks of the state representatives on the Council. We are not surprised by this fact, because the IOCC is, after all, an advocate for the positions of the state oil and gas production regulators. Just as we are advocates for communities and the environment and the industry an advocate for its interests, we would expect nothing less from IOCC. We simply cannot be convinced that the outcome might have been any different than it was, given the makeup of the panel.

This concern raises a substantive point about the potential benefits of an IOCC-led peer review process for E&P wastes. Can an organization that advocates for the producing states be expected to look closely and objectively at the strengths and weaknesses of state environmental programs? We suspect not, especially when the reviewers are limited to representatives of the states and the industry. Peer review will be effective only when representatives of EPA and citizens' groups are among the reviewers, and again, are represented in equal numbers. EPA officials and citizens, or representatives of public-interest groups, are "peers" in the same sense that state regulators and industry representatives are peers--they have legitimate interests as citizens in seeing the state regulatory programs are improved.

We think that EPA's presence as a program evaluator in any peer review process is vital for another reason. It will force action by the states. The one round of serious evaluation by the states of their oil and gas waste programs was during EPA's investigations in preparation of the *Report to Congress* in 1986 and 1987. The presence of EPA officials and contractors in the offices of state agencies and in the oil fields themselves grabbed the attention of state regulators and industry people alike.

The final Council *Report* is lacking in a number of areas, the most of important of which we highlight below:

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[2]U.S. Environmental Protection Agency, Regulatory Determination for Oil and Gas and Geothermal Exploration, Development, and Production Waste. 53 Federal Register 25446-25449.

- The *Report* assumes that all E&P wastes will continue to be exempt from the hazardous waste requirements of Subtitle C of RCRA. This assumption is premature given that Congress reserved for itself the final word on the exemption. In addition, we must point out that the recommendation of the EPA staff was for Subtitle C designation for the associated wastes; EPA's upper-level management chose otherwise. Even the *Report to Congress* recognized the very real toxicity and hazardousness of the associated wastes.

- The *Report* should have recommended that each state adopt as a program performance goal the recognition that every environment and every member of the public deserve an equal level of protection from harm. This is especially necessary if the program stresses flexibility based on state or regional differences.

- The *Report* also lacks a statement that conveys the sense of a minimum performance standard that would be applied to all E&P waste management practices. In establishing regulatory programs, states should have as their goal the setting of performance standards that "prevent releases of toxic materials to the extent possible." The closest the report comes to such a goal is the provision in section 5.1.a. that recommends that E&P wastes "be . . . managed at all times to prevent contamination of ground and surface water, soil and air, protect public health, safety and the environment, and prevent property damage." We would like to have seen that statement adopted as the overall goal, or standard, by which all state programs and management practices are judged.

- The *Report* offers no special warnings about or criteria for management of the associated wastes; they are treated like all other wastes, subject only to the minimum requirements of existing state rules. This oversight is especially glaring given EPA's concerns that the states had adopted few if any controls on the associated wastes. At the very least, the Council should have recommended segregation of the associated wastes as a minimum waste management practice.[3]

- The *Report* does not recommend minimum, quantitative performance standards for individual waste management practices. Opportunities for such standards include:

  - DOUBLE LINING WITH LEACHATE COLLECTION SYSTEMS AND MONITORING OF THE VADOSE ZONE for large-scale evaporation ponds at centralized and commercial disposal facilities, gas-processing plants, and compressor stations;

  - Minimum FREEBOARD for lined evaporation ponds, lined reserve pits, and lined production pits, as specified by minimum depths (in meters or feet) or by storm-event analysis;

  - Effective LEACHING PROCEDURE to determine if the waste is characteristically hazardous, regardless of its exempt status; such testing should be done on wastes that are to be landspread, landfilled or buried, and disposed of in centralized or commercial facilities. (Ohio required EP Toxicity testing for all wastes buried or landfilled off site.)[4]

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[3]EPA Regulatory Determination, pages 25451 and 25455.

[4]Council on Regulatory Needs Final Report. Appendix B, State Summary for Ohio.

- The final *Report* altered the substance of our continued objection to disposal of E&P wastes in municipal landfills. Draft versions clearly suggested that such practice be prohibited by the states--a concept recommended by the Subcommittee on Off-Site Commercial Facilities. The final version suggests that such disposal "should not be considered when better disposal options are available," but caveats that cautionary note with an acquiescence to E&P waste disposal "in municipal waste landfills only when such landfills are designed to contain such wastes." Regardless of their designs, municipal landfills are inappropriate for use as E&P waste disposal facilities. Allowing industrial wastes of any kind in municipal solid waste landfills is simply bad public policy. It will contribute to the continuing lack of municipal landfill capacity, will lead to the creation of new Superfund sites, and in the case of oil and gas wastes, subsidizes the industry's waste disposal needs. E&P wastes should be disposed of in facilities that are designed exclusively for oil and gas wastes and that are operated by oil and gas companies, at their expense.

- The *Report* does not recommend the prohibition or sharp curtailment of certain waste management practices that EPA found were legally causing environmental damages and potentially endangering human health in major oil and gas producing states. Those practices include:

  - UNLINED PITS of any kind in any setting: Ohio has now outlawed discharges of produced water to any pit;[5] exemptions to a no-pit rule should be granted only in rare occasions where the geology warrants;

  - Use of UNLINED RESERVE PITS for drilling muds and fluids that contain toxic substances and hazardous materials;

  - DISCHARGES TO WETLANDS along the Gulf Coast; pretreatment of produced water discharges has been shown to be undependable[6] and treatment of those discharges to water quality standards allows for some degradation of receiving waters;

  - DISCHARGES TO SURFACE WATERS AND EPHEMERAL STREAMS west of the 98th Meridian; EPA's oil and grease concentration limit of 35 mg/L has been shown to be unacceptable in Wyoming, which limits discharges to 10 mg/L[7]; California allows discharges of up to 75 mg/L oil and grease--more than two times the federal standards[8]; climatic and geologic conditions cannot explain the need for these differences;

  - RESERVE PIT DISCHARGES TO THE NORTH SLOPE TUNDRA; this practice has caused widespread damage to the tundra and is proving to be particularly difficult, if not impossible, to remediate.

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[5]Ibid.

[6]See, for instance, St. Pe, K., et al. An Assessment of Produced Water Impacts to Low-Energy, Brackish Water Systems in Southeast Louisiana: A Project Summary. In: Proceedings of the First International Symposium on Oil and Gas Exploration and Production Waste Management Practices, U.S. Environmental Protection Agency (New Orleans), September 10-13, 1990, pages 31-42.

[7]Wagner, J.F. Toxicity and Radium 226 in Produced Water--Wyoming's Regulatory Approach. In: EPA Symposium Proceedings, pages 987-994.

[8]Council on Regulatory Needs Final Report. State Summary for California.

- The *Report* does not address plugging and abandonment of production or disposal wells. Unplugging and improperly plugged wells were identified by EPA as a major source of contamination. Even in states with plugging and abandonment rules, "wells are abandoned every year without being properly plugged."[9]

- The *Report* lacks specific criteria for minimum state personnel needs and inspection frequencies. Guidelines in these areas would be helpful given the Council's finding that staff levels varied from one FTE per 9.3 wells to one FTE per 5,991 wells. We are certain that the appropriate number is not the latter ratio.

- The *Report* does not recommend certain administrative criteria that are critical for an effective state program. These criteria are especially relevant given that public participation requirements were not mentioned in the summaries of 10 key states that we examined in detail in preparation for this minority report.[10] Those criteria would include:

  - PUBLIC NOTICE OF THE AGENCY'S RECEIPT OF AN APPLICATION, rather than notice of the agency's intent to issue a permit. Early public involvement in the permitting process is essential to meaningful participation.

  - The opportunity for CITIZENS TO ACCOMPANY AGENCY PERSONNEL on inspections, as provided in SMCRA.

  - In addition to the public records provision in the *Report*, PUBLIC ACCESS to records required to be generated by the operator, whether those records are located in the files of the operator or the agency.

  - The opportunity for CITIZENS TO ENFORCE REGULATIONS when the agency declines to do so for any reason (that is, "citizens' suits"), as provided in numerous state and federal environmental statutes, including RCRA.

To summarize, we support the concept of communication and dialogue to address the nation's environmental problems, and in particular, to help the states improve their capabilities to regulate oil and gas production wastes effectively. The IOCC Council on Regulatory Needs was an important first step in that process, but failed to go beyond the regulatory practices and programs already sanctioned by the states. The process itself was not balanced because the interests of affected communities and citizens were underrepresented.

The Council's final *Report* does not promote a broad performance standard for E&P waste management, does not recommend performance standards for most individual practices, and does not recommend against the use of certain waste management practices that have been shown to cause environmental damages. The document is less than the public expected and will only marginally help the states upgrade their programs, and only if the states have the political will to do so. For these reasons, we continue to believe that a federal regulatory and oversight program is needed to effectively control the hazards associated with E&P wastes.

Finally, our participation in this process was based on good faith, on the need to communicate with diverse interests, and on the assumption that it is intrinsically good to help the states improve their existing regulatory programs. It was not intended to be, nor is it to be construed as, acquiescence to the findings

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[9]USEPA. Report to Congress. Executive Summary, page 44.

[10]Those states were Alaska, California, Colorado, Kentucky, Louisiana, Ohio, Oklahoma, New Mexico, Pennsylvania, and Texas.

in EPA's *Report to Congress* nor a statement of support for EPA's regulatory determination. We remain in disagreement with the conclusions and recommendations of both.

Again, we appreciate having been invited to serve as advisors to the IOCC Council on Regulatory Needs. We enjoyed participating in the substantive discussions and will always value the personal contacts and acquaintances we made.

Sincerely,

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