AREA WASTE MANAGEMENT PLAN FOR DRILLING AND PRODUCTION OPERATIONS

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ABSTRACT

The concept of the Area Waste Management Plans (Plan) for use in a company's drilling and production operations is explained. The objective of the Plan is to improve a company's waste management performance by developing appropriate waste strategies and communicating them to the field operations personnel handling the wastes.

The Plan provides a process for identifying appropriate waste management strategies in a specified area's operations. These strategies consider current regulatory requirements, company policies, economic and practical factors. Management practices covered in the Plan include minimization, storage, handling, and disposal. Once developed, these strategies are communicated to field operations through a document specifically designed for effective use by field drilling and production personnel handling the wastes.

The Plan's objectives, development, content and possible alternative applications are presented. Examples are given from the development of an actual Plan.

INTRODUCTION

One environmental issue receiving significant attention in recent years within the oil and gas exploration and production industry is the handling and disposal of wastes generated by the various drilling and production operations. Heightened interest within the public and regulatory agencies toward environmental issues has been an impetus for the industry to scrutinize its wastes and how they are managed.

From a private company's perspective, proper waste management is an important part of doing business. A company must be concerned with compliance with applicable waste regulations, minimizing the impact of wastes on the environment, and the reduction of potential liability associated with improperly disposed waste. This must be accomplished all within the certain economic bounds. Also, eliminating or minimizing the generation of waste is becoming more critical - both environmentally and economically - as a means of reducing waste-related liabilities and costs.

This paper reviews the concept of the Area Waste Management Plan (Plan) as a means of improving the management of wastes generated by a company's drilling and production operations. The development and use of Area Waste Management Plans, as described in this paper, allow a company to effectively identify and communicate sound waste management strategies. These strategies are based on the regulatory, environmental, technical, and economic criteria applicable to a specific geographic area's operations. The development, content, format, and possible alternative applications of the Plan are presented.

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WASTE MANAGEMENT CONCERNS

Upon a cursory review of the Company's drilling and production operations, several concerns were identified regarding the handling and disposal of certain wastes generated by its operations. Production operations reviewed were from a broad scope of operating facilities, including oil production (both primary and secondary), gas production, and gas processing plants. Drilling operations observed included drilling, workover, and completion operations. These field operations were situated in a variety of environmental and regulatory settings.

Waste management concerns generally manifested themselves in inconsistent minimization, handling and disposal practices. In reviewing the operations themselves and interviewing operations personnel, specific reasons these waste management concerns became evident.

The primary reason for the waste management concerns was a lack of understanding of the wastes and the management options available for their handling and disposal. This was due to several factors, including a complex and changing regulatory climate, lack of clear guidance on the environmental aspects of field operations, and the perception of competing environmental and economic goals.

Regulatory Climate

Most state oil and gas agencies began regulating waste from drilling and production operations before the inception of many of the federal environmental statutes passed in the early 1970s. Historically, regulation of wastes in the oil field focused on drilling fluids and produced water.

Since the early 1970's, a number of the federal environmental statutes, and subsequent state statutes and regulations, have been passed which affect the management of oil and gas waste. Each state has developed regulations to control these wastes as specified in the federal laws, and as specified in the individual state's environmental statutes.

Though adequate, individual states' requirements for oil and gas waste management vary significantly. This variability reflects the diverse geological and environmental conditions in each state. Often attributed to the historical emphasis on drilling fluid and produced water, the regulations are often not specific on a waste by waste basis.

For operations on federally controlled land, separate and overlapping regulations administered by the respective federal agencies (e.g. BLM, Forest Service) must be complied with, in addition to state requirements. Additionally, the regulations have been amended frequently over the last ten years.

This complex regulatory climate, which changes with time and with geo-political boundaries, contributes significantly to the lack of understanding of compliance requirements affecting waste management in the oil field.

Management Options Not Understood

In the operations reviewed, many viable waste management options allowed by the applicable regulation were not being utilized. This was primarily due to a lack of understanding of the available options which met the appropriate regulatory, environmental, company policy and economical criteria. Operations personnel responsible for waste management at each facility had inadequate resources available for determining and choosing among the feasible options.

Adequate guidance from regulatory agencies was generally not available. Copies of the applicable regulations were readily available, but commonly these regulations were not clearly written for individuals not familiar with regulatory

documents. Internal guidance from the company was often unavailable or inadequate. Several reasons for this were:

- Relevant company policies on waste management were too general;
- Environmental personnel (staff) who were knowledgeable on the regulatory, environmental, and technical aspects of waste management were not knowledgeable in field operations; and
- The 1980's business climate - although the concern for environmental matters has increased, profit margins and support staffs have been reduced.

With no usable guidance, field operations personnel frequently decided unilaterally on methods of handling and disposing of wastes. This often resulted in wastes being managed in ways which, though historically acceptable, were without full consideration of the regulatory and environmental criteria which possibly applied. Conversely, some operations were using over-conservative waste management practices, when equivalently compliant and protective methods were available that were less costly.

Needs Assessment

The following is the needs assessment resulting from the identification of the waste management problems and their root causes:

1. Improve Understanding of Wastes and Waste Management Requirements and Options
2. Establish Waste Management Goals and Performance Standards
3. Improve Communication and Implementation of Goals and Standards

AREA WASTE MANAGEMENT PLAN

The concept of the Area Waste Management Plan, as described below, is intended to address the stated needs in the following manner:

1. Provides a process to identify appropriate management strategies (i.e. minimization, handling, and disposal practices) for wastes generated by production or drilling operations; and
2. Provides an effective means of communicating those strategies so they may be implemented effectively.

In identifying appropriate waste management strategies, all relevant criteria are considered, including regulatory, environmental, company policy, practical, and economical. As important as identifying sound waste management practices, is ensuring they are properly implemented. The second component of the Plan is the development and use of a user-friendly document which provides effective guidance to field operations personnel requiring the information.

Much of the regulatory and technical information required to identify acceptable management options for specific drilling and production waste was addressed generally by the American Petroleum Institute in its document entitled *Environmental Guidance Document for Onshore Solid Waste Management in Exploration and Production Operations (API/EGD)*[1]. The development of the Area Waste Management Plan uses and builds upon the regulatory and technical information contained in the API/EGD.

Development of Plan

The first phase of the Plan process consists of identification of wastes and guidance on the management of those wastes. A Plan is developed using a rigorous step-wise process of identifying wastes, then selecting and prioritizing management options (i.e. minimization, handling, and disposal practices for each waste).

Throughout the development process, the involvement of field personnel (several levels are preferred - supervisors to roustabouts) is critical to: a. identify all waste streams and management options; and b. to ensure their support of the Plan when published.

Each step in this waste management practices selection exercise is described below. With each step, examples are given from the development of an actual Plan for the Company's Southeast New Mexico Production Operation[2]. Examples used in this paper are based on regulation which was current as of May 1, 1990. A brief summary of this six-step process is found in Table 1.

Step 1: Identify Area of Coverage

A logical scope for the Plan must be defined by selecting the area which the Plan will cover. Developing one cohesive Plan to cover all the operations in a company is generally not possible unless the operations are limited geographically or operationally. It is assumed, therefore, that initially a company's operations must be divided into several "areas" for the purpose of developing the Plan for each. On the other hand, a company's operations should not be divided into so many Areas that there are too many individual Plans to practically develop and maintain. In defining an Area of Coverage for the Plan, the primary goal is to define areas with common aspects which may affect waste management strategies. An Area should be defined by operational, as well as geographic or areal, boundaries.

Defining an area geographically should be based primarily on common regulatory requirements, environmental, and geological characteristics. Areas based on the applicable waste regulations usually follow state (or other geo-political) lines which define regulatory jurisdiction. An Area may also be defined geographically, based on common environmental and/or geological aspects. The surface environment where an operation exists often influences the various management options available. The geological (i.e., reservoir) aspects influence the nature of production and drilling wastes generated.

A geographically-based Area can be further refined by determining the relative benefit of defining the Area based on common operations. It may be effective to develop separate Plans for each of the major types of operation - namely drilling, production, or gas processing plant. Another method to consider in defining an Area is to have separate Plans for each operational organization. In some cases, an Area defined by organization (e.g., Area Plan for Production Dept.) allows more customizing with respect to the ultimate user of the Plan.

Example of defining an Area: In defining the Area for the Southeast New Mexico Production Operations' Plan, the following rationale was used:

- Regulatory: Oil and gas wastes are primarily regulated by the New Mexico Oil Conservation Division (NMOCD), therefore the initial area definition was by state. The two primary oil and gas regions in New Mexico are in the Northwest (NW) and Southeast (SE) corners of the state. One reason for dividing the state in two is the regulatory agency jurisdiction--the NW has a large percentage of federal and Indian land and the SE is predominately privately owned.

- Environmental: The two regions are also distinct in their environment. The NW is a high plateau region crossed with several large river basins. The SE is very much like West Texas, flat with little surface water.

- Geological: Gas is the primary product from the San Juan Basin in the NW. The SE is an extension of the Permian Basin, which is a mature oil and gas producing region. The difference in the resource products also causes a difference in the nature of the wastes.

• Operational: Three operational considerations influenced the definition of the Area:

1. Waste management options vary between the two regions, partially due to the differences in the service industry which has evolved in each region.
2. Separate production offices manage the NW and SE operations, giving another reason for dividing the state's operations in two.
3. Separate Plans were developed for Drilling and Production Operations because the two are managed by separate departments within the Company.

Step 2: Identify Wastes in Area's Operations

Once an Area is defined, all wastes generated by the operations need to be identified. This is best done on a process by process basis. The primary processes associated with drilling and production operations, and wastes generated from those processes, are summarized in the API/EGD. In addition to wastes generated directly from the drilling or production process, many wastes are generated through indirect activities. These include wastes from vehicles, maintenance activities, office or living quarters in remote locations, and infrequent or unexpected activities. An example of a waste generated by an infrequent activity is residue from a well treatment with a special chemical. Unexpected activities may include product or chemical spills, or the discovery of friable asbestos in an insulated vessel or building.

Example of Area's Waste: Waste identified as being generated, or potentially being generated in the SE New Mexico area are listed in Table 2.

Step 3. Categorize Wastes

Once an Area's wastes have been identified, they must be categorized. Categorizing the wastes as they are defined by the applicable regulations is necessary to ensure they are managed in compliance with those regulations. Even though oil and gas wastes are regulated under varying state programs, all programs must adhere to several basic waste definition principles established under the federal Resource Conservation and Recovery Act (RCRA)[3]. RCRA is the federal statute which regulates solid waste ("solid waste" can be solid, semi-solid, or liquid wastes). In developing the RCRA statute, Congress recognized the special nature of oil and gas exploration and production wastes, and exempted them from hazardous waste regulations. This "exemption" is the key to categorizing oil and gas wastes in order to facilitate their proper management under the various regulatory scenarios found nationally.

The Environmental Protection Agency (EPA) listed specific oil and gas wastes as "exempt" or "nonexempt" in its Regulatory Determination submitted to Congress in June 1988. Using this Determination as a basis, all oil and gas wastes generated in an Area may be divided into the following major categories:

Exempt Waste - Wastes generally coming from an activity directly associated with the drilling of an oil or gas well or the production and processing of a hydrocarbon product. These wastes are considered non-hazardous industrial wastes under RCRA and under state statutes following RCRA. Some states have a narrower interpretation of *Exempt Waste*, which should be considered in categoring specific wastes in those states.

Example of Exempt Waste: Bottom Sediment and Water (BS&W or tank bottoms) is the non-saleable fraction of the production stream which settles in the bottom of storage tanks and process vessel. Since BS&W comes from the vessels directly associated with production, this waste is categorized *Exempt*.

Nonexempt Waste - Waste coming from the maintenance of production or drilling equipment, or otherwise not unique to the oil and gas exploration and production industry. Though *nonexempt*, these wastes are not necessarily hazardous.

Because *Nonexempt Wastes* are potentially subject to RCRA's hazardous waste regulations (RCRA Subtitle C), they must be subdivided to ensure proper management:

Nonexempt Non-Hazardous Waste: Wastes which are neither listed characteristically hazardous as defined by the RCRA regulations. These wastes can generally be managed as non-hazardous industrial waste, similar to exempt wastes, under most state regulations.

Nonexempt Hazardous Waste: Wastes which are either listed or characteristically hazardous as defined by RCRA regulations. These wastes must be managed as hazardous wastes under the respective state and federal regulations.

Example of Nonexempt Waste: Waste hydrocarbon based solvents generated from cleaning production equipment are classified *Nonexempt* because they are associated with a maintenance activity not necessarily unique to the oil and gas industry. Some waste solvents are classified *Nonexempt Hazardous* due to being characteristically hazardous for failing the RCRA ignitability test[4]. Others exhibit no hazardous characteristics under the RCRA criteria, thus are *Nonexempt Non-Hazardous*.

Nonexempt Special Waste: Wastes which are specifically identified and controlled under separate statutes and regulations--either on a state or federal basis. These wastes are usually handled separately under the federal and state regulatory programs due to their uniquely unsafe nature.

Example of Nonexempt Special Waste: Both PCBs and asbestos are unique wastes which warrant special handling and disposal dictated by separate statutes and regulation, thus are *Nonexempt Special Wastes.*

The API/EGD fully describes the regulatory basis for the above classification system as well as lists specific wasted defined as *Exempt* or *Nonexempt* by EPA.

Step 4. Identify All Management Options for Specific Waste

For each waste identified and categorized, all possible management practices potentially available for that waste should be listed. Within the context of the Plan, "waste management" includes:

Minimization: Methods which minimize or reduce waste's volume and/or risk of doing harm to people or the environment.
Handling: Practices associated with waste from the point of generation to the point of disposal. Handling includes storage, transportation, recordkeeping, waste sampling and analysis, and use of contracted waste handlers.
Disposal: Methods and locations associated with on-site and off-site disposal or recycling of the waste, including use of public or private disposal locations.

Management option to consider are:

- Practices used for the waste in the Area
- Practices used for the waste in other Areas
- Practices used for other types of wastes
- Practices used by other companies or industries for similar wastes

The practices listed for the waste must be consistent with the waste's category. This means only practices which comply with the various regulations applicable to the waste's category in the Area should be listed. Waste categories are particularly important when considering mixing of several waste streams for storage, handling or disposal.

This step is a brainstorming exercise meant to identify potential practices. In this step, the listing of a particular practice or idea should not be biased by its practicality, availability or lack of historical use in the Area. It is important for the environmental engineer to identify possible new practices by transferring ideas and technology from other industries or geographic areas.

Example of "brainstorming" options - for BS&W in SE New Mexico:

Minimization

1. Change oil treatment process to reduce or change character of BS&W.
2. Allow more BS&W to be sold in production stream by lowering quality standard of product.

Handling

1. Drain BS&W from vessels into temporary earthen pits.
2. Use a vacuum truck to pump BS&W out of vessels.
3. Use liners, drip pans or catchment basins to minimize BS&W spillage.
4. Use contracted labor specialized in BS&W clean out of vessels.
5. Use company employees for BS&W clean out.
6. Use rigid containers with no leaks to store BS&W during handling.

Disposal

1. Spread/Disk in on lease road (with agency approval).
2. Haul by commercial oil reclaimer, who reclaims BS&W partially and disposes remainder in industrial landfill.
3. Landfarm (with agency approval)
4. Bury onsite (with agency approval)
5. Haul to centralized treatment disposal facility operated by company.
6. Keep records related to the disposal of BS&W.

Step 5: Select Acceptable Management Practices

From those listed in Step 4, practices deemed acceptable by applicable regulatory and company standards in the specific Area are chosen. The criteria used to deem a practice acceptable are:

- Acceptable under applicable waste regulation for the Area
- Acceptable under company environmental policy

Company policy dictates that besides being in regulatory compliance, practices must minimize the environmental impact and/or potential long-term environmental liability where possible.

Example: Of the management options listed in Step 4. for BS&W associated with Southeast New Mexico Operations, only the following were selected:

Minimization: None acceptable. No other treatment processes are available to reduce volume or nature of BS&W. Neither Company policy nor the state oil and gas regulations will allow product quality standard lower than the one currently used in the area.

Handling: All handling methods listed in Step 4. are acceptable except Option 1. Company policy calls for minimizing the use of earthen pits for wastes, even when allowed by regulation.

Disposal: Hauling to a commercial reclaimer or disposing at a Company-operated site (Options 2 and 5) are allowed by the agency.

Step 6: Prioritize Selected Management Practices

In most cases, more than one option will remain available after the selection process in Step 5. Three factors to consider in prioritizing the remaining minimization, handling, and disposal practices are practicality for the field

operations, availability of options with specific area, and cost of options. Some acceptable options may even be eliminated from further consideration due to availability, practicality, or cost. A simple scheme of deeming the first priority option as "Preferred" and all others "Acceptable" is utilized.

Example: The options selected in Step 5 for BS&W in the Southeast New Mexico Plan were prioritized as below:

Minimization - None

Handling

Preferred Option - Use contracted labor specialized in BS&W clean-outs. Vacuum trucks to pump BS&W and appropriate use of drip catching liners to minimize BS&W spillage is also specified for use by the contractor.

Acceptable Option - Use company employees for BS&W clean-out when contractor not available.

Disposal

Preferred Option - Haul to commercial oil reclaimer.

Acceptable Option - None. Use of a Company operated oil reclaimer is not currently available, nor practical or economical to operate.

The majority of an Area's Waste Management Plan is complete upon performing this six-step management selection exercise for each waste generated in the area. Though this process may appear protracted as presented here, it may be completed quickly with environmental and operations personnel working closely. Additionally, similar wastes occurring across Areas make development of subsequent Areas' Plans easier.

Writing the Plan's Document

In order for the collection of management guidelines for an Area's wastes to be useful, they must be communicated effectively to the Operations personnel generating and handling the wastes. Attention must be given not only to the content of those guidelines but also the format in which those guidelines are presented.

1. Target Plan Toward Field Supervisor

With Operations personnel providing input to the six-step management option selection exercise, the Plan's document should be substantively practical and useful to Operations. Yet, for the document to be accepted and truly functional, it must be written in a style and format which is desired by the primary user group - field operations personnel.

More specifically, the primary users of the document are the first and second line production and drilling supervisors. These supervisors are often the focal point for implementing new policies and requirements generated by management and engineering personnel in the Company. It is important that they are provided clear, concise directives on what is required of their operation. This includes appropriate background and details without diluting the primary intent of the guidance. Other users of the Plan document are engineers, management, environmental professionals, and field personnel.

2. Plan's Format

To provide a concise, straight forward directive, as well as an appropriate amount of detail in the Plan document, a two-tiered format was used. This entailed having an encapsulated version of the Plan--called the One Page Summary, backed up by the full document.

The One Page Summary serves several purposes. It acts as a quick reference guide

for all users. More importantly, it provides a comprehensive summary of the Plan on one page, which makes waste management guidance directly available to field personnel who normally would not read a technical manual. This One Page Summary may be incorporated in a plant operator's or pumper's field book or posted on a plant or field office bulletin board.

Appendix A shows the One Page Summary for Southeast New Mexico Production Operations. Appendix B describes the full document's basic structure and content. Appendix C gives an example of one waste's Handling and Disposal guidelines from the Plan.

3. Document Production Details

Many documents or manuals produced by a company to relay details on a technical subject to its employees are ineffective because they are written and maintained by a detached staff group within the company. Often these manuals are not presented in a "user-friendly" format. To avoid some of the pitfalls of a Company Manual, the following were employed in producing and maintaining the Plan:

- Written and maintained by an environmental engineer who is familiar with and works with field operations routine.
- Significant opportunity for Operations to provide input into the Plan's publication and maintenance by the use of frequent and sometimes informal update/revisions.
- Use full power, personal computer-based word processor to write and maintain the Plan. This affords a high quality document while allowing quick revisions of the Plan.

Implementation and Maintenance of Plan

Once written, several critical steps remain for the Area Waste Management Plan to be implemented for use by Operations. Final approval and endorsement of the Plan must be received to ensure its use by the line personnel including:

1. Final review and comment from specific operations supervisory personnel who will use the Plan;
2. Review and approval by Legal Counsel; and
3. Review and endorsement by management

In maintaining the Plan, the local environmental engineer or staff (i.e. group working directly with Operations) should maintain control. Informal, minor revisions requested by Operations should be incorporated to allow the Plan to remain practical and dynamic. Revisions should also be made as regulatory or policy changes occur.

Formal reviews should occur periodically (biannually is suggested) to ensure all guidelines remain consistent with current regulations, technology and environmental science. The intent of the subsequent periodic reviews and updates is more than ensuring compliance. New and innovative minimization, handling and disposal strategies should be formally reviewed through the six-step process used to enhance the original Plan.

Although the examples presented in this paper are for Production operations only, the Plan's concepts have been similarly applied to Drilling and Gas Plant operations.

CONCLUSIONS

The development, implementation, and maintenance of the Area Waste Management Plan concept improves the Company's waste management by satisfying the stated needs as follows:

1. Improved understanding of wastes and waste management requirements and options was accomplished by listing and categorizing an Area's wastes, then listing available management options based on those categories.

2. Waste management goals and performance standards were established by use of the Plan's six-step development process to select and prioritize appropriate management options.

3. Communication and implementation of the established waste management goals and standards were improved by the writing and implementing of the Area Waste Management Plan document, as described, for the field operations.

ALTERNATIVE APPLICATIONS OF PLAN CONCEPT

This Area Waste Management Plan concept employs basic principles in identifying wastes and appropriate waste management practices based on an individual company's needs. The same concept can easily be applied on a broader scale.

Multiple Company Plans

One application is a collection of oil and gas companies combining efforts to develop and use a Waste Management Plan for all their operations in a defined area. The Plan's development process would not have to be altered significantly. There may also be added benefit in having the companies identify common problems and assist one another in solving those problems, either individual or collectively. One example extending from a multiple company Plan is possible establishing waste disposal sites cooperatively used and maintained by the companies involved.

Industry/Government Plan

A second possible application to the Area Waste Management Plan concept would involve a cooperative effort between private industry and the regulatory agency. Having the two entities working together would facilitate an increased awareness of the respective group's needs and goals. Using the Plan concept could avoid certain pitfalls in the regulatory process, and halt the trend of increasingly specific waste regulation.

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3. United States Congress: "Hazardous Waste Identification", *Resource Conservation and Recovery Act of 1976* (passed Oct. 31, 1976), Subtitle C, Section 3001.

4. Environmental Protection Agency: "Regulation for Identifying Hazardous Waste", *Code of Federal Regulations* (original publication, 45 FR 33119, May 19, 1980), 40 CFR 261.

5. New Mexico Oil Conservation Division: *Rules and Regulations*, (March 1, 1987), Sections B, C, and Appendices.

6. This Paper Was Presented At The 1990 Annual Technical Conference, New Orleans, Louisiana, September 23-26, 1990.

APPENDIX A

One-Page Summary of Area Waste Management Plan for
Southeast New Mexico Production Operations

WASTE	SEC.	HANDLING & DISPOSAL GUIDELINES
		PRODUCTION WASTES
REFUSE,PAPER,TRASH	2.1.1	• Use trash containers, no pits. Dispose using local trash contractor or directly with municipal landfill
PRODUCED WATER	2.1.2	• Reinject into ARCO wells or dispose using a water hauler listed on the Hobbs office's approved bid list
USED OIL	2.1.3	• Recycle to production stream, or sell to approved oil relaimer*.
OIL & WATER FILTERS	2.1.4	• Drain fluids back to production. Dispose dry filter with trash at approved municipal landfill
TANK BOTTOMS, BS&W	2.1.5	• Reclaim using approved tank cleaner*.
SLOP OIL	2.1.6	• Reclaim* or add to crude production
"HOT OIL" PARAFFIN	2.1.7	• Circulate hot fluid/paraffin back to production stream
CONTAMINATED SOIL	2.1.8	• For oil or water spills, remove free liquids, disk in or bury, stained soil. For spills of certain chemicals or if required by the agency, remove soil and haul to an approved disposer*.
SOLVENTS	2.1.9	• Use approved solvent recycler*, or call Env. Rep.
EMPTY DRUMS	2.1.10	• Be sure drum is empty of all free liquids. Through Materials Rep.: 1. be sure bungs are in; 2. return to vendor; 3. use approved commercial drum disposer.
SURPLUS CHEMICAL	2.1.11	• Through Materials Rep.: 1. find a use for it at another ARCO facility; 2. return to vendor; or 3. call Environmental Rep.
METHANOL	2.1.12	• For de-icing or testing lines, circulate back to production stream.
USED ACID BATTERIES	2.1.13	• When buying new battery, have dealer retain battery when changed out. Store or transport no more than 3 used batteries at a time.
		COMPLETION & WORKOVER WASTES
WORKOVER & WELL TREATMENT FLUIDS	2.2.1	• Use lined pits. Vacuum fluids out and dispose at approved commercial facility*, or circulate back to production with Production's approval.
MISCELL. RIG WASTES buckets, empty sacks, used filters, quarters trash	2.2.2	• Do not store or dispose in reserve or other pit. Use all material dope before disposing of empty containers. Store in a dumpster and dispose at authorized landfill.

SPECIAL WASTES: PCBs, ASBESTOS, PESTICIDES, NORM, TRICHLOROETHYLENE (Sec. 2.3)
If these wastes, or material suspected to contain these wastes, are found, notify your Supervisor or Environmental Rep. for handling and disposal.

********** GENERAL NOTES **********

1. * Reclaim oily wastes using contractors and disposal locations listed on the back of this Summary or in Section 3.2 (*Waste Handlers and Disposal Sites*) of the full Area Waste Management Plan.
2. SEC column shows the Section of the complete Waste Management Plan. For more detail on these and other waste guidelines, refer to the complete Plan or call the Environmental Department (915-688-5560).
3. If unidentified material or waste is found at an ARCO facility, contact your Supervisor or Environmental Rep. for assistance in identifying and handling.
4. If illegal disposal by a contractor is seen or suspected, contact your supervisor.
5. Waste disposal into pits is no longer acceptable. All pits are permitted for only specific uses; know these uses.

APPENDIX B

Basic Format and Content of Full Area Waste Management Plan

Section I Introduction

- Brief background and description of Plan including definition of waste categories

Section II Handling and Disposal Guidelines - By Waste

- Guidelines presented on a waste-by-waste basis, including a brief description of the waste and its source, its waste category, and a listing of "Acceptable" and "Preferred" management practices.
- Handling practices cover waste minimization, waste storage, testing/analysis and requirement where appropriate.
- Disposal practices include waste transportation, types of disposal methods, appropriate record to keep, and specific disposal locations and companies to use.
- To facilitate locating wastes in the plan, wastes are grouped by the operation from which they are generated:

1. Production Operations - Wastes are grouped as follows:

   Production Wastes - for routine field production operations
   Workover/Completion Wastes - for well work handled by the Production Department
   Special Wastes - for non-routine or unexpected wastes, such as PCB's or asbestos).

2. Drilling Operations - Wastes are grouped as follows:

   Drilling Wastes - for waste generated from operations associated with a drilling rig
   Workover/Completion Wastes - for waste generated from operations associated with a pulling unit or completion rig
   Non-Rig Operations Wastes - for wastes from operations not requiring a rig such as wireline work
   Special Wastes - as addressed in the Production section above).

3. Gas Plant Operations - Wastes are grouped only as Gas Plant Wastes and Special Wastes.

Section III: District/Company Waste Management Policies and Practices

- Relevant Company or District policies or guidelines related to waste management are included. These may have been generated aside from, or as a part of, the Waste Management Plan process.
- Such general policies or guidelines may include: Hazardous Waste Handling and Disposal, Identification and Handling of Unidentified Materials, and Selection of Waste Contractors.

Appendix: Summary of APE Guidance or Onshore Solid Waste Management in Exploration and Production Operations

- This is included for the plan's users and reviewers because the plan is heavily reliant on the API/EGD as a reference for regulatory, technical and environmental information regarding oil field waste management.

Section	Subject
Waste Management Plan Southeast New Mexico	TANK BOTTOMS & BS&W

2.1.5 TANK BOTTOMS AND BS&W

Tank bottoms or BS&W (basic sediment and water) is an oil field term referring to solid and emulsified waste that settle out of crude oil into tanks and process vessels. BS&W is normally a liquid heavily laden with solids and often entrained with produced water.

Category: *Exempt Waste*

Handling and Disposal

1. Preferred Handling and Disposal - An approved tank cleaner or hauler* should be used to remove and transport BS&W. Contractors handling BS&W should be disposing of the non-saleable fractions at a facility approved to accept such material* (i.e., permitted by NMOCD). Check with the Superintendent or Section 3.2 of this plan for alternate disposal facilities, for an alternative to Parabo.

2. Acceptable Handling - If/when an approved tank cleaner is not available, company personnel may be used to remove and store the BS&W. Disposal at an approved disposer* is still required.

3. Removal of BS&W from the vessels should be done in a manner where no spillage occurs. Use of drip pans, plastic liners or catchment vessels are recommended to ensure this.

4. If BS&W has to be stored, rigid containers are preferred. BS&W should never be stored in (even temporarily) in lined pits.

5. Records related to the disposal of BS&W should be retained for at least three years, including:

   Date of shipment
   Hauler's name and approval number
   Disposer's name and approval number
   Source/location of origin
   Volume of load

* **See Section 3.2 for a list of currently approved waste disposers and the process of selecting waste contractor. If a list is not available, check with the Area Production Superintendent.**

Table 1
Process for Development of Waste Management Strategies

STEP 1: Identify Area of Coverage

Define Areas similar in:
- Regulations
- Geology
- Environment
- Operations

STEP 2: Identify Wastes in Area's Operations

List all solid, semi-solid, & liquid wastes from all processes in Area's operation

STEP 3: Categorize Each Waste

Categories:
- *Exempt*
- *Nonexempt Non-Hazardous*
- *Nonexempt Hazardous*
- *Nonexempt Special*

STEP 4: Identify All Minimization, Handling, Disposal Options for Each Waste

Choose from these possible options:
- Current practices for waste in Area
- Practices used in other Areas
- Practices used for other wastes
- Practices used in other companies or industries

STEP 5: Select Acceptable Management Practices

All options selected must be acceptable under applicable regulations and Company policies
- i.e., must be environmentally sound by Company and government standards

STEP 6: Prioritize Remaining Options

- Prioritize based on policy, practicality, and cost.
- Practice may also be eliminated based on practicality or cost.

Table 2
Wastes Generated by Production Operations in SE New Mexico

Production Wastes

Refuse	Contaminated Soil	Slop Oil
Produced Water	Solvents	Paraffin
Used Lube Oil	Empty Drums	Surplus Chemicals
Tank Bottoms, BS&W	Methanol	Used Acid Batteries
Oil and Water Filters		

Completion & Workover Wastes

Well Completion, Treatment & Workover Fluids
Miscellaneous Rig Wastes

Special Wastes

Asbestos	Pesticide Waste
Pesticide Waste	Trichloroethylene
PCBs (Polychlorinated Biphenyls)	