

BLM

1992

## DEPARTMENT OF THE INTERIOR

## BUREAU OF LAND MANAGEMENT

## DECISION RECORD AND FINDING OF NO SIGNIFICANT IMPACT

for

## ENVIRONMENTAL ASSESSMENT:

DISPOSAL OF PRODUCED WATER INTO THREE NONFEDERAL SURFACE DISPOSAL FACILITIES THAT DISCHARGE INTO MAN-MADE STRUCTURES, EDDY AND LEA COUNTIES, NEW MEXICO.

The Roswell District Office of the Bureau of Land Management has proposed to approve applications to dispose of produced water through Notice To Lessees 2B (NTL-2B) into three existing nonfederal surface disposal facilities that discharge into man-made structures. These facilities are located on private and state land, and are regulated and approved by the New Mexico Oil Conservation Division (NMOCD). This decision reflects the analysis and review conducted in the attached environmental assessment (EA), from public comments, and fulfillment of the requirements of applicable federal laws.

## DECISION

Based upon consideration and analysis of the alternatives within the environmental assessment, and in compliance with the laws and regulations relating to the proposed action, I hereby select the Proposed Action as the BLM's decision for the action.

The requirement for the action is documented in the EA. A tremendous volume of saline formation water is produced along with the hydrocarbons extracted from thousands of oil and gas wells in southeastern New Mexico. This water must be disposed of by one of several accepted methods, which include injection into a geologic formation or evaporation in surface ponds. There are several commercially operated surface disposal facilities in southeastern New Mexico; three of these facilities discharge their waters into man-made evaporation ponds. These facilities are:

<u>Facility</u>	<u>Order #</u>	<u>Location</u>
Controlled Recovery	R-9166	Sec. 27, T. 20 S., R. 32 E.
Loco Hills	R-6811-A	Sec. 16, T. 17 S., R. 30 E.
Parabo	R-5516	Sec. 29, T. 21 S., R. 38 E.

These three facilities are located on private and state land, and are the disposal sites discussed in this EA. These facilities have

Sundance  
Inc.  
NWOP NEF  
No  
DP  
Landmann

been permitted by NMOCD, and have been in operation for some time; however, their use by Federal lessee/operators must be authorized by BLM in accordance with NTL-2B. The regulations implementing the National Environmental Policy Act (NEPA) require that BLM assess the impacts associated with such authorizations.

The EA addressed the Proposed Action and a No Action Alternative (denial of future NTL-2B applications and rescission of existing NTL-2B permits citing use of these facilities).

The proposed action of this EA authorizes produced water disposal in accordance with NTL-2B at three surface disposal facilities permitted by the NMOCD that discharge produced water into man-made structures.

Specific elements of the Proposed Action include:

- \* Requests for authorization to dispose of produced water at these three facilities will be processed in accordance with NTL-2B.

- \* BLM will recommend the following mitigative measures to NMOCD, the regulatory agency with jurisdiction. These recommendations will not be stipulations for approval of NTL-2B applications:

- 1) Require all three private waste water disposal facilities to flag their active evaporation ponds to deter migratory birds.

- 2) To regularly monitor groundwater quality at all three facilities by analysis of samples from monitor wells to ensure that contamination of groundwater does not occur.

- 3) To inform BLM of any wildlife protection or groundwater quality problems as they occur.

The No Action Alternative was considered, but was not acceptable based upon the need to dispose of significant volumes of produced water by methods approvable through NTL-2B.

Four mitigation measures were considered in the EA. Proposal number one, to require flagging, was modified to the above form to conform to existing U. S. Fish and Wildlife Service (USF&WS) Regional policy and to rely upon the NMOCD, who have legal jurisdiction, for the regulation of these facilities. Proposal two, to require notification of BLM when monitor wells were to be sampled, was dropped because the NMOCD has jurisdiction and is already monitoring sampling. Proposal three, to have NMOCD notify BLM of any problems, was adopted above in slightly modified form. Proposal four, to require monitoring wells at Controlled Recovery with periodic testing for specific toxic water components, was modified to request NMOCD, the agency with jurisdiction, to continue to monitor groundwater quality and inform BLM of any problems.

## RATIONALE FOR DECISION

During the summer of 1992 the Roswell District Office of the BLM conducted an in-depth analysis and review of the subject facilities.

These three facilities already exist and have been in operation for several years. No significant negative environmental consequences of disposal of produced water at these facilities have been documented. The facilities are in compliance with NMOCD requirements, and are inspected regularly by the USF&WS and NMOCD. No wildlife mortalities have been documented. The facilities will continue to dispose of private and state produced water regardless of this decision, and the water quality and surface area of the evaporation ponds would be unchanged.

Copies of the EA were sent to approximately 70 individuals, oil and gas lessees and operators, cooperating agencies and environmental groups for review and comment. Five responses were received from outside BLM, four of which recommended adoption of the Proposed Action. None advocated the No Action Alternative. Several modifications and editorial recommendations were offered, most of which were adopted. The Proposed Action is consistent with current USF&WS enforcement policies.

This action is in conformance with existing regulations and statutes. The facilities are on private and state lands and are licensed by the State of New Mexico; guidance from BLM's New Mexico State Office holds that RMP prescriptions apply only to facilities located on Federal lands, and that a plan amendment is not needed for the actions proposed in this EA.

## FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined that selection of the Proposed Action would not have a significant impact on the human environment and, therefore, conclude that preparation of an Environmental Impact Statement (EIS) is not required.

Leslie M. Cone  
DISTRICT MANAGER

10/15/92  
DATE

ENVIRONMENTAL ASSESSMENT

DISPOSAL OF PRODUCED WATER INTO THREE SURFACE DISPOSAL FACILITIES  
THAT DISCHARGE INTO MAN-MADE STRUCTURES, EDDY AND LEA COUNTIES,  
NEW MEXICO.

ROSWELL DISTRICT OFFICE  
BUREAU OF LAND MANAGEMENT

OCTOBER 1992

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## I. INTRODUCTION

Oil and gas reservoirs occur in porous sedimentary rock beds which are surrounded by nonporous or impermeable rocks. There is invariably some formation water distributed throughout a reservoir, though it is often more concentrated in the lower portion, below the oil. Production of this water with the hydrocarbons is a natural consequence of production, and cannot be avoided. As the hydrocarbons in a reservoir are depleted over time, the volume of water produced with a given volume of oil increases. Therefore, the total rate of production of water from an oil field increases over time. The volumes of produced water can become very large. Sometimes it is this increased production of water, and the attendant handling and disposal costs, which results in the abandonment of some or all of the wells in a particular oil field.

Extensive development of oil and gas resources in Southeast New Mexico has been occurring since the 1920s, producing in excess of 4.1 billion barrels of oil to date. The oil fields in this part of the State are currently producing over 345 million barrels of water annually compared to approximately 60 million barrels of oil. The proper management of this tremendous volume of water is a major part of the oil and gas industry infrastructure in Southeast New Mexico.

Water produced with oil is primarily salt water, commonly called brine, a pollutant which requires proper handling and disposal. Care must be exercised in the management of produced water because of potential damage to other resources, including the possibility of polluting lakes, streams, or ground water aquifers which provide water for drinking or agricultural purposes. Both the State and Federal governments regulate the disposal of this produced water. The Bureau of Land Management (BLM) authorizes disposal of water produced from Federal wells through Notice to Lessees and Operators No. 2B (NTL-2B): Disposal of Produced Water. A copy of NTL-2B is included in Appendix A.

### A. Need for the Proposed Action.

Produced water is commonly injected into the subsurface reservoir from which it came. A large portion of the produced water in southeast New Mexico is disposed of in this fashion through oil and gas well bores no longer needed for production purposes or through wells drilled solely for the purpose of injection. Disposal by injection is preferred by BLM over other methods.

NTL-2B also provides for surface disposal into lined or unlined evaporation pits. The typical surface disposal facility is a pit installed by the well operator as part of operations on the oil and gas lease. Federal oil and gas operators commonly use injection wells, lined or unlined pits on their own leases, or they may use such facilities on properties owned by others depending on their particular circumstance and needs.

The need for alternate disposal methods is great enough in southeast New Mexico that several commercial surface disposal facilities have been constructed to handle and dispose of produced water as a business enterprise. These facilities receive produced water by truck, store the water temporarily

in large tanks, and reclaim the oil that rises to the surface. The water that remains after this reclaiming process is placed in an open, lined pit for further separation of entrapped oil. These hydrocarbon-containing pits are netted to protect wildlife. After this oil has been removed, the remaining saline water, which should now be oil-free, is placed in ponds to evaporate. These ponds are very large, may be unlined, and the facilities have typically been granted exceptions to netting requirements by the New Mexico Oil Conservation Division, in consultation with the U. S. Fish and Wildlife Service. Other mitigative measures and/or close monitoring is then required by NMOCD to protect wildlife.

Existing commercial surface disposal facilities in southeast New Mexico have been authorized through permits by the NMOCD. No such facilities exist on Federal lands in the Roswell District. However, Federal oil and gas operators may elect to use such commercial facilities as their needs dictate. The use of a privately owned, commercial disposal facility by a Federal lease operator must be authorized under NTL-2B. Of the commercial produced water disposal facilities using surface disposal methods in Southeast New Mexico, three are discharging produced water into man-made structures for evaporation purposes. These three facilities are the subject of this Environmental Assessment.

These facilities have been permitted by NMOCD, and have been in operation for some time; however, their use by Federal lessee/operators must be authorized by BLM in accordance with NTL-2B. The regulations implementing the National Environmental Policy Act (NEPA) require that BLM assess the impacts associated with such authorizations. BLM proposes to authorize the removal of produced water from Federal oil and gas leases to three existing commercially operated surface disposal facilities in the Roswell District that discharge into man-made structures.

#### B. Conformance with Land Use Plans.

The three commercial surface disposal facilities discharging produced water into man-made structures covered by this EA are located in Eddy and Lea Counties. These two counties are covered by decisions made in the Carlsbad Resource Management Plan (RMP) dated September 1988. Decisions in the Carlsbad RMP cover all of the Federal surface and Federal subsurface mineral estates within the Carlsbad Resource Area. The RMP is supported by the Proposed Resource Management Plan/Final Environmental Impact Statement and Revised Proposed RMP issued in January 1988. Decisions affecting oil and gas operations are further supported by analysis contained in the Environmental Assessment for Oil and Gas Leasing in the Roswell District (BLM, 1981).

The Carlsbad RMP provides management prescriptions specific to produced water disposal. The guidance in the RMP prescribes that produced water disposal in pits and injection wells will be in accordance (approved) with NTL-2B. The use of unlined produced water pits is further limited to areas in Southeast New Mexico described in NMOCD Order No. R-3221-B. This means that unlined pits are prohibited for produced water disposal in most parts of the Resource Area. This management guidance allows unlined pits to be authorized according to NTL-2B in discrete areas described in the aforementioned Order R-3221-B and its amendments. The Planned Action formulated in the RMP is to restrict the use of pits west of the Pecos River. None of the three facilities subject to this EA are west of the Pecos River. The only other action is to require



netting over open produced water tanks and pits (State NMOCD Orders and Rules require netting or other approved mitigative measures).

The proposed action of this EA is to authorize produced water disposal in accordance with NTL-2B at three surface disposal facilities permitted by the NMOCD that discharge produced water into man-made structures. This action is in conformance with existing regulations and statutes. The facilities are on private and state lands and are licensed by the State of New Mexico; guidance from BLM's New Mexico State Office holds that RMP prescriptions apply only to facilities located on Federal lands, and that a plan amendment is not needed for the actions proposed in this EA (J. W. Whitney, personal communication, August 5, 1992).

C. Relationship to Statutes, Regulations, or Other Plans.

Oil and gas leasing and development of Federal lands are conducted under authority of the Mineral Leasing Act of 1920 and the Mineral Leasing Act for Acquired Lands of 1947. The leases which allow a company to drill and produce hydrocarbon resources grant certain rights and privileges to the lessee subject to the terms and conditions of the lease itself and the Federal oil and gas operating regulations in 43 CFR 3160. Included with the rights granted is the obligation to undertake whatever reasonable operations as are necessary to efficiently develop and produce the mineral resource. This includes disposal of water produced with the oil and gas. The operating regulations include the requirements and instructions in NTL-2B (43 CFR Parts 3162.1 and 3164.2(b)).

While BLM regulates produced water disposal through NTL-2B, other government agencies also control produced water. The Environmental Protection Agency (EPA) has a specific regulatory program for injection wells as authorized by the Safe Drinking Water Act. The EPA Underground Injection Control Program (UIC) has been delegated to the State of New Mexico. The State UIC program regulations are contained in NMOCD Rules 701 through 708. NMOCD Rule 8 covers surface disposal using pits. The State of New Mexico exercises these joint responsibilities for produced water control on Federal lands under authorities contained in the State's Oil and Gas Act and Water Quality Act. Specific State regulations for commercial produced water disposal facilities are contained in NMOCD Rule 711 (copy included in Appendix B).

Additional Federal laws and Orders that can apply to produced water management are:

1. The Clean Water Act
2. The Migratory Bird Treaty Act
3. The Fish and Wildlife Coordination Act
4. Executive Orders 11988 (Floodplain Management) and 11990 (Wetlands)
5. Water Pollution Control Act
6. Water Quality Act
7. Federal Land Policy and Management Act
8. National Environmental Policy Act.

The selection of alternatives, mitigating measures and findings developed in this EA are based in part on the guidance in NTL-2B. The NTL forms the basis of BLM's enforcement authority with respect to produced water. The BLM has plans in the near future to replace NTL-2B with Onshore Order No. 7. When

Onshore Order No.7 becomes effective, produced water disposal rules will be codified in an amended 43 CFR Part 3164.1. The basic authorities in the planned Order No.7 will be unchanged; BLM will continue to regulate produced water disposal. The following differences between the draft Order and NTL-2B are worthy of mention:

1. The reporting requirements of NTL-2B will be eliminated.
2. Detailed pit construction specifications will be required.
3. Off-lease disposal will not be approved by BLM if the facility has not been permitted or otherwise approved by other State or Federal regulatory authorities.

The conclusions in this EA will not be significantly affected by any differences between NTL-2B and Order No.7. However, to assure adherence to specific procedures, the Appendix to this EA will be amended with the final version of Onshore Order No.7.

## II. PROPOSED ACTION AND ALTERNATIVES

### Assumptions:

This EA and the alternatives cover three existing commercially operated surface disposal facilities which discharge produced water into man-made structures and have been licensed by the NMOCD. Produced water disposal into injection wells, commercial facilities discharging into natural features, and on-lease facilities as a part of lease operations is not a part of this EA.

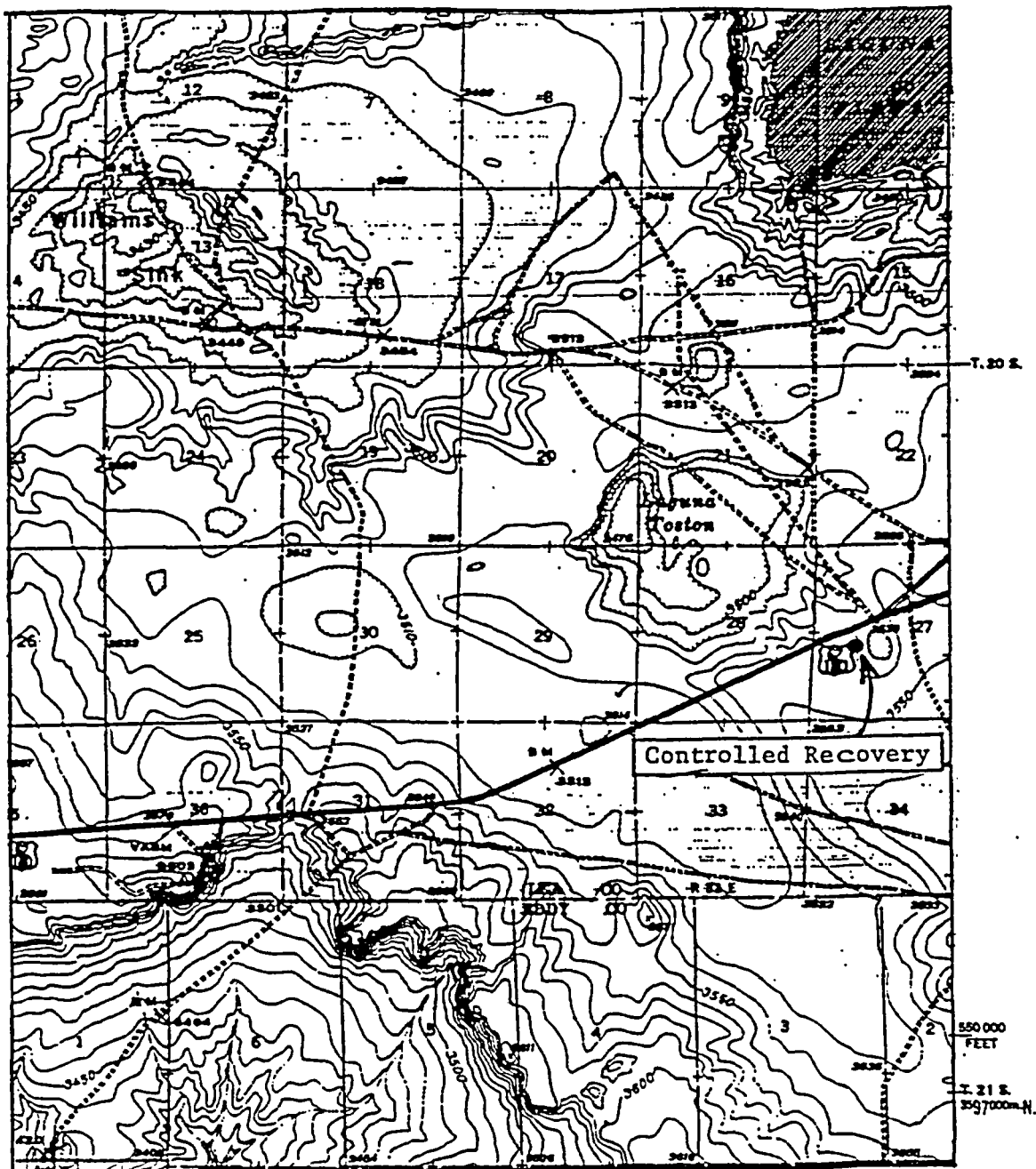
### Alternative A: Proposed Action.

The proposed action is to approve new applications for the disposal of formation water produced during Federal oil and gas lease operations to three existing privately owned surface disposal facilities. These authorizations would be processed by BLM in accordance with guidance contained in NTL-2B, Disposal of Produced Water, and its eventual successor, Onshore Order No. 7. These facilities are licensed by the New Mexico Oil Conservation Division for commercial surface waste disposal operations. They discharge into man-made structures. These facilities are:

<u>Facility</u>	<u>Order #</u>	<u>Location</u>
Controlled Recovery	R-9166	Sec. 27, T. 20 S., R. 32 E.
Loco Hills	R-6811-A	Sec. 16, T. 17 S., R. 30 E.
Parabo	R-5516	Sec. 29, T. 21 S., R. 38 E.

(SEE FIGURES 1, 2, and 3)

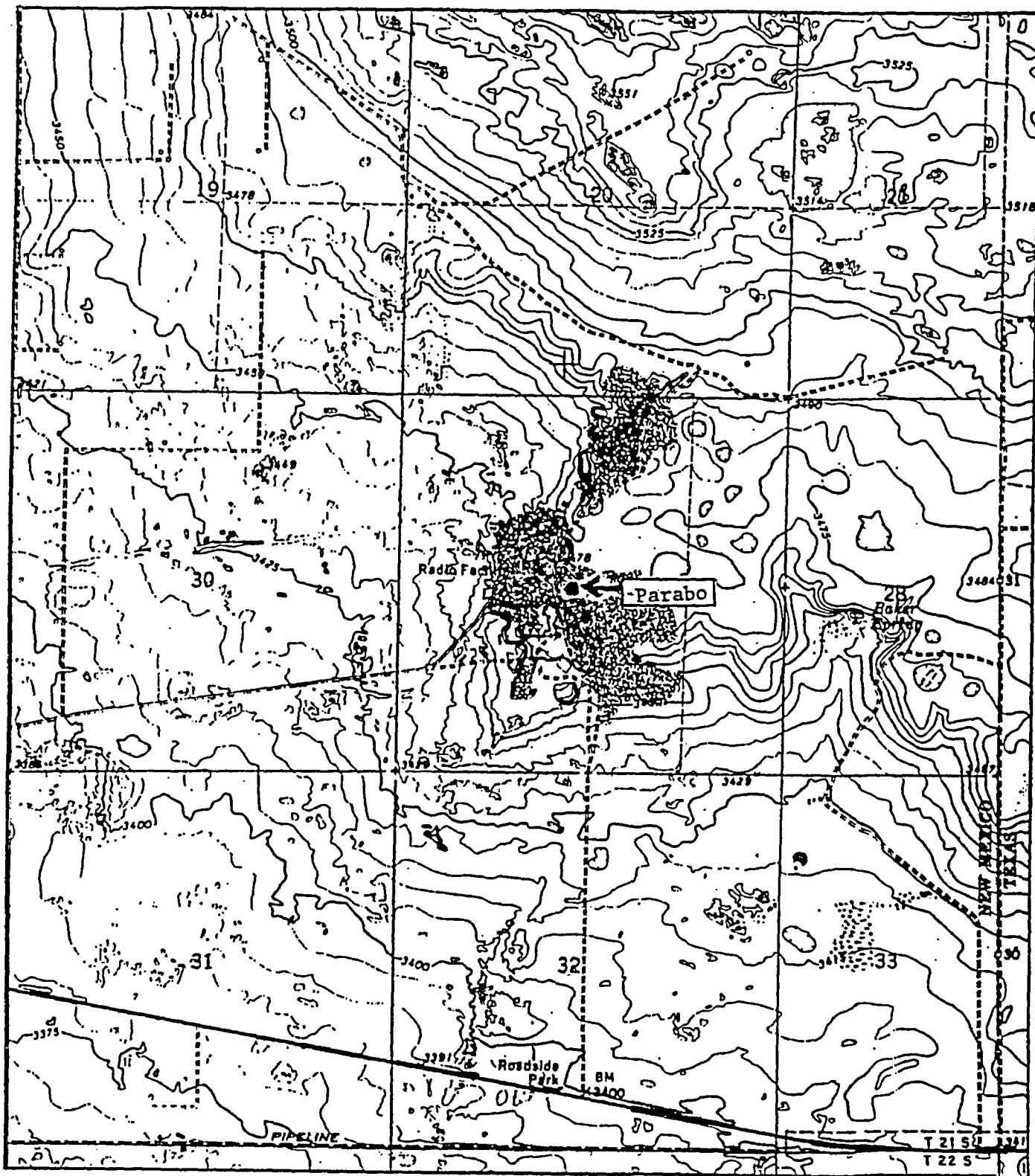
Only these three sites are included in this alternative. No other commercial surface disposal facilities would be subject to BLM authorizations under this EA; if applications for disposal are received for similar facilities in the future, their approval will be subject to separate environmental assessments.



1 Mile

Figure 1:  
Plat Showing Location of  
Controlled Recovery Facility





1 Mile

Figure 3:

Plat Showing Location of  
Parabo Facility

### Alternative B: No Action.

Under this alternative, new NTL-2B applications to dispose of produced water from Federal oil and gas wells into these three privately owned surface disposal facilities which discharge into man-made structures would not be approved. Existing permits to dispose of produced water from Federal wells would be rescinded.

### III. AFFECTED ENVIRONMENT

The following sections describe components of the Roswell District's environment in the areas of study. Only those items which are likely to be impacted by the disposal of produced water from Federal oil and gas wells into the above-listed existing, privately owned surface disposal facilities which discharge into man-made structures and are licensed by the NMOCD will be given descriptive emphasis. Data examined included published groundwater and geologic reports, files in the NMOCD offices in Santa Fe, Artesia, and Hobbs which include geologic, hydrologic, and water quality data, and tours of the sites. All data is public information.

#### General Setting

The study area is located in southeastern New Mexico, in Eddy and Lea Counties. The area is in the Pecos Valley section of the Great Plains physiographic province, which is a ". . . very irregular erosional surface which slopes toward the Pecos River, . . . generally southward . . . topography of the Pecos Valley section is further complicated by areas of interior drainage which are apparently the result of deep-seated collapse due to solution, and by vast areas of both stabilized and drifting dune sand" (Nicholson Jr. and Clebsch Jr., 1961, p. 7). Elevation at the facilities ranges from 3450 to 3662 feet, with local relief limited to a few tens of feet.

The climate in the study area is characterized by low annual rainfall, averaging between nine and 14 inches, although rainfall amounts can vary significantly. Temperatures are high, with summer maxima commonly over 100 degrees Fahrenheit. Humidity is typically low, resulting in estimated evaporation rates for water at the Red Bluff Reservoir of around 3180 barrels per month per acre (E. L. Reed & Associates, Parabo application). This is an area of high seasonal winds, which add to the evaporation potential.

This is a sparsely populated area, with the major economic base being mineral extraction, both hydrocarbons and potash ore. Ranching is another significant component of the economic base of the area.

#### Critical Elements

The consideration of critical elements in an environmental assessment is mandatory. The following critical elements have been considered and determined to be either not present or not affected by the proposed action or the alternative:

- Areas of Critical Environmental Concern.
- Cultural Resources.
- Farm Lands (Prime or Unique).
- Floodplains.
- Native American Religious Concerns.
- Vegetation.
- Wetlands and Riparian Zones.
- Wild and Scenic Rivers.
- Wilderness.

Other critical elements that may be affected by the proposed action or the alternative are denoted by an asterisk in the heading.

### Geology

The study area is located within the Permian Basin, a large depositional basin that formed during Permian time (Figure 4). The Permian Basin is a heavily developed, prolific producer of hydrocarbons. The Loco Hills facility is located on the Northwestern Shelf within the Permian Basin, while Parabo is on the Central Basin Platform and Controlled Recovery is on the boundary between the Northwest Shelf and the Delaware Basin.

A general listing of the stratigraphic units found in the study area is found in Figure 5. This study is principally concerned with surface and near-surface geologic formations. The geologic map (Figure 6) shows the general surface formation at the three subject locations to be alluvium and bolson deposits of Quaternary age. For detailed descriptions of area geology, see Kelley (1971), Grant and Foster (1989), Hendrickson and Jones (1952), and Nicholson Jr. and Clebsch Jr. (1961). Site-specific descriptions of surface deposits may be found in the section of this EA describing Hydrology and Water Quality.

### Fluid Minerals

Southeastern New Mexico is a significant hydrocarbon-producing area. Oil was first produced from Permian rocks in the Artesia field in Eddy County in 1923. The giant Hobbs field, with total reserves exceeding 250 million barrels of oil, was discovered in 1930. Through 1986, more than 5.19 billion barrels of oil and 36.9 trillion cubic feet of gas had been produced from all of New Mexico, with the southeastern part of the state currently accounting for around 90 percent of the oil and half of the gas. In 1990 the Roswell District had 27,085 producing wells, 85 percent of which were oil wells. Total district production in 1990 was 62,507,948 barrels of oil and 474,064,501 MCF of gas. Over 345,000,000 barrels of water were produced. The oil and gas industry is by far the largest source of income to the State of New Mexico.

Most of the oil produced in southeast New Mexico comes from Permian-aged sandstones and carbonates. For detailed summaries of the occurrence of oil and gas in the area, see Grant and Foster (1989) and the Roswell Geological Society Symposia on the Oil and Gas Fields of Southeast New Mexico (1956, 1960, 1967, 1977, 1988).

### \*Air Quality

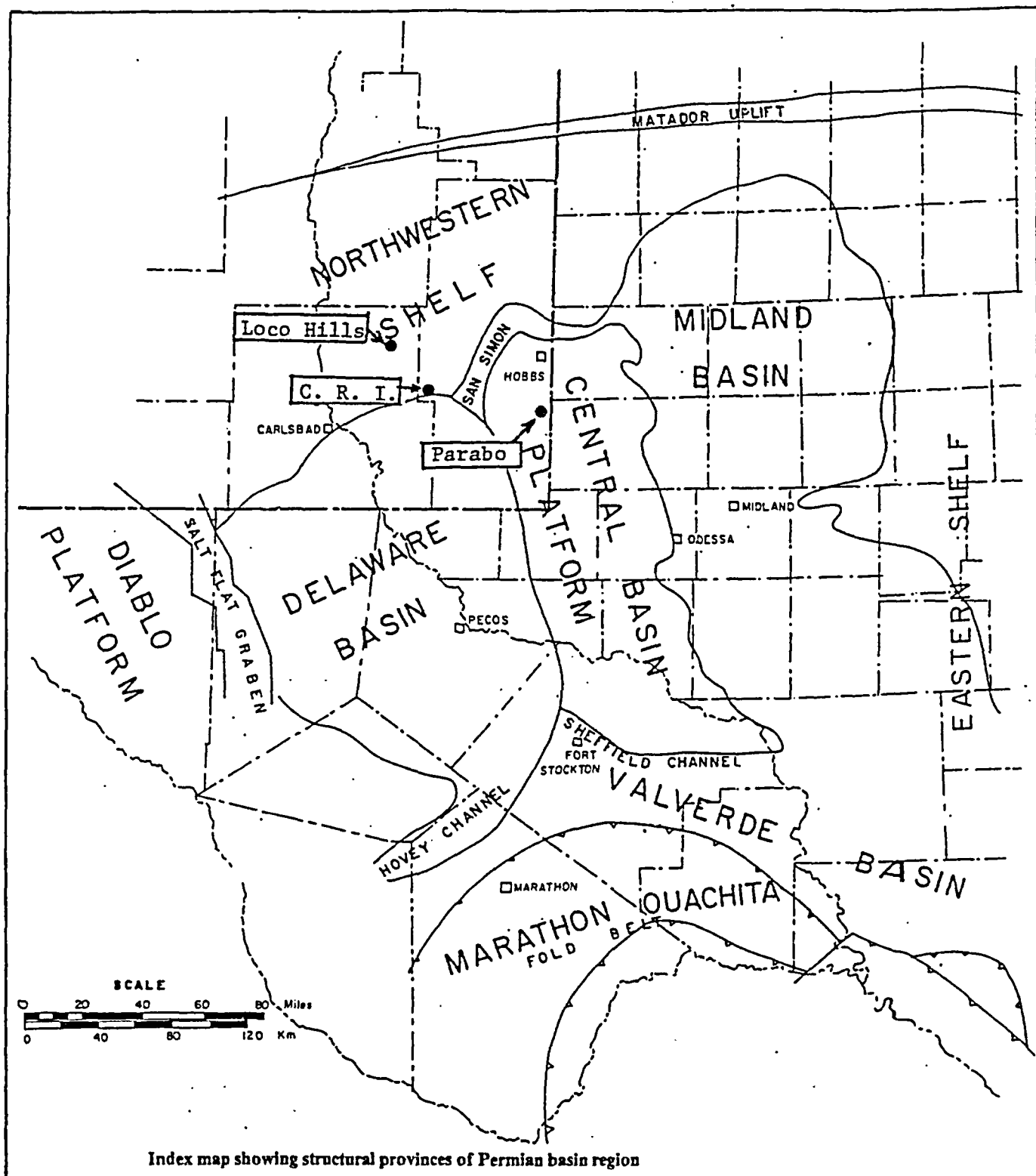


Figure 4:  
(after Hills, 1984, p. 251)

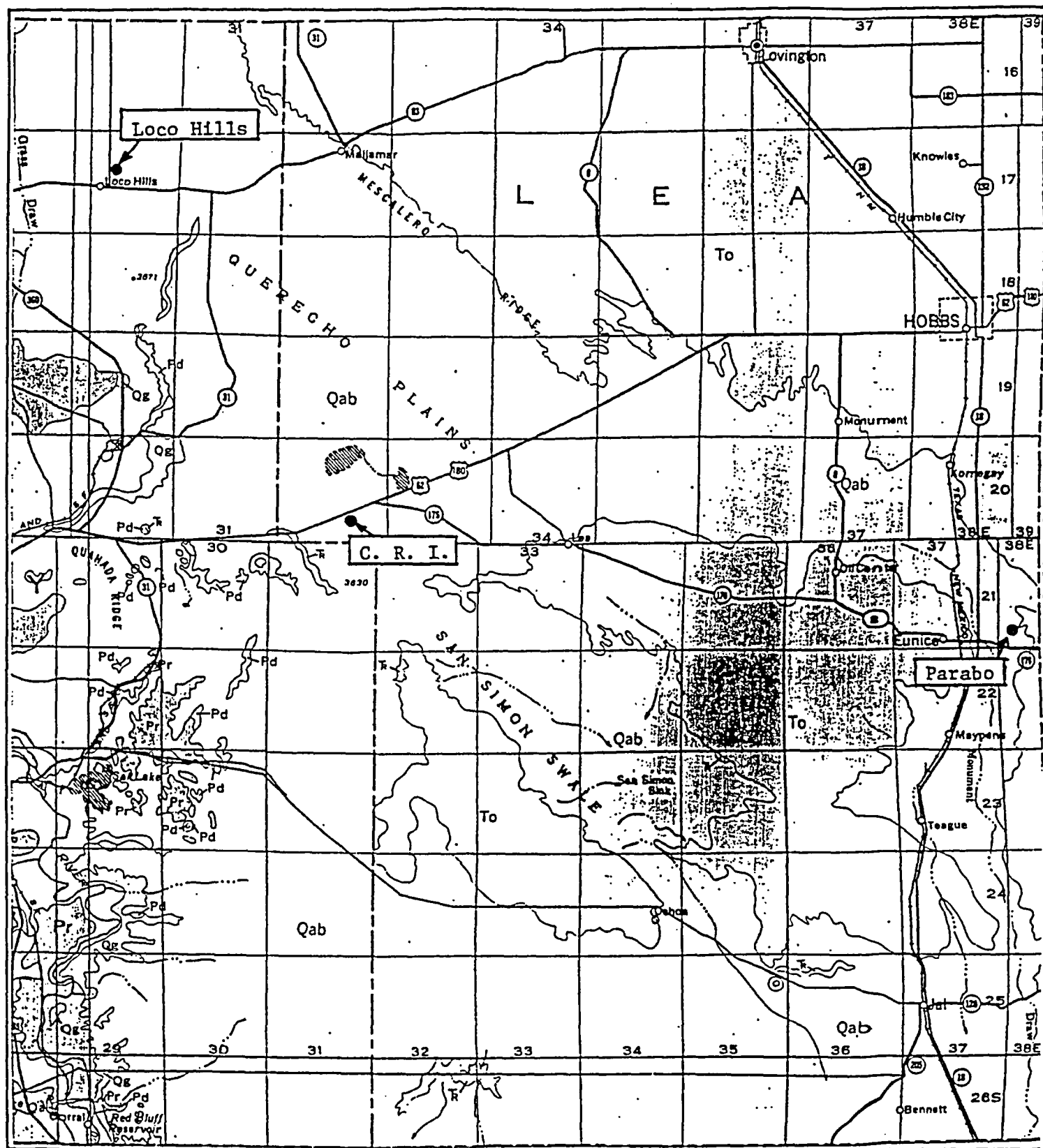


# STRATIGRAPHIC UNITS IN SOUTHERN LEA COUNTY, N. MEX.

GEOLOGIC AGE		GEOLOGIC UNIT	THICKNESS (ft)	GENERAL CHARACTER	WATER-BEARING PROPERTIES
Cenozoic Quaternary	Recent	Sand	0-30±	Dune sand, unconsolidated stabilized to drifting, semiconsolidated at depth; fine- to medium-grained.	Above the zone of saturation, hence, does not yield water to wells. Aids recharge to underlying formations by permitting rapid infiltration of rain-water.
	and Pleistocene	Alluvium	0-400±	Channel and lake deposits; alternating thickbedded calcareous silt, fine sand, and clay; thickest in San Simon Swale; less than 100 feet thick in most places.	Saturated and highly permeable in places in east end of Laguna Valley. Forms continuous aquifer with Ogallala formation. Wells usually yield less than 30 gpm. Locally above the water table.
Cenozoic Tertiary	Pliocene	Ogallala	0-300±	Semiconsolidated fine-grained calcareous sand capped with thick layer of caliche; contains some clay, silt, and gravel.	Major water-bearing formation of the area. Unsaturated in many localities, such as north side of Grama Ridge, west side of Eunice Plain, Antelope Ridge area, and Rattlesnake Ridge. Greatest saturated thickness along east side of Eunice Plain, west of Monument Draw, where wells yield up to 30 gpm. Highest yields, up to 700 gpm, obtained from wells along south edge of Eunice Plain, east of Jal.
Mesozoic Cretaceous		Undifferentiated	35±	Small isolated and buried residual blocks of limestone, about 3 miles east of Eunice.	Possibly small isolated bodies of water locally.
Mesozoic Triassic	Dockum group	Chinle formation	0-1,270±	Claystone, red and green; minor fine-grained sandstones and siltstones; underlies all of eastern part of southern Lea County area; thins westward; absent in extreme west.	Yields small quantities of water from sandstone beds. Yields are rarely over 10 gpm. Water has high sulfate content.
		Santa Rosa sandstone	140-300±	Sandstone, chiefly red but locally white, gray, or greenish-gray; fine- to coarse-grained; exposed in extreme west; underlies Cenozoic rocks in western part of area, and is present at depth in eastern part.	Yields small quantities of water over most of the area. Some wells are reported to yield as much as 100 gpm. Water has high sulfate content.
Paleozoic Permian or Triassic		Undifferentiated	90-400+	Siltstone, red, shale, and sandstone; present at depth under all of southern Lea County.	No wells are known to be bottomed in the red beds. Probably can yield very small quantities of high-sulfate water.
Paleozoic Ordovician through Permian			6,500-17,000±	Thick basin deposits ranging in character from evaporites to coarse clastics; thinnest on the east side of the area over the Central basin platform, thickest toward the southwest.	No presently usable water supply available from these rocks. Source of highly mineralized oil-field water.
Precambrian				Granite, granodioritic and other igneous and metamorphic rocks; complex structure.	Not hydrologically significant.

Figure 5:

(after Nicholson Jr. & Clebsch Jr.,  
1961, p. 30 - 31).



6 Miles

Figure 6:

Geologic Map of Study Area  
(after Dane & Bachman, 1965)

Clean Air Act compliance and air quality is regulated by the New Mexico Environment Department. The facilities are not located in regulated air districts. Produced water disposal facilities are not monitored for air quality by the New Mexico Environmental Department.

Produced water is not tested for air toxins. Evaporation and volatilization increases potential for release of air toxins such as benzene, toluene, ethylbenzene, xylene, and other volatile organic compounds (VOCs).

Hydrogen sulfide gas (H<sub>2</sub>S) is monitored under Occupational Health and Safety Administration regulations. All facilities comply with H<sub>2</sub>S regulations.

#### \*Hazardous Materials

Produced water is exempt from regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA). The definition of hazardous substances in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) does not exclude produced water. Produced water may contain constituents that are regulated as hazardous substances under CERCLA. These hazardous substances include but are not limited to benzene, toluene, ethylbenzene, xylene, and polyaromatic hydrocarbons. Testing is required to determine if the hazardous substances exist and if they are above reportable quantities.

Produced water is not tested for hazardous substances prior to disposal. Leaching into the subsurface and volatilization increases potential for release of these hazardous substances, if present. At this time the State regulatory agencies (New Mexico Environmental Department and Oil Conservation Division) do not require testing of produced water or monitoring of the facilities for release of hazardous substances.

#### \*Hydrology and Water Quality

##### Controlled Recovery, Inc.

Surface and near surface deposits at CRI's brine disposal facility are of Quaternary age. Lithologies consist of caliche, sand, and mixtures of clay, sand, gravel, and caliche. Thickness of these units varies from 0 to 45 feet. These units are underlain by approximately 800 feet of Triassic red beds, consisting largely of impermeable red clays, siltstones, and occasional sandstone stringers. The Rustler Formation anhydrite, gypsum, and limestone underlie the Triassic red beds and are approximately 300 feet thick beneath the site.

Surface drainage in the area is from rainfall runoff toward Laguna Toston, located three-quarters of a mile northwest of the facility. Rainfall is less than 10 inches per year and no permanent streams occur in this area. The CRI facility has a berm around the total area, which is designed to retain on site rainfall and prevent surface runoff. Laguna Toston is a natural collapse feature forming a playa lake. The laguna is currently being used by one of the potash companies for salt water disposal.

Ground water movement at the CRI site consists of downward percolation of rain water through the Quaternary alluvium to the red bed contact. It then moves

horizontally toward Laguna Toston. Figure 7 shows the water table in the area and indicates a hydrologic gradient of 15 feet per mile.

Recharge to this system is not considered significant due to low rainfall and high evaporation rates. Some ground water storage is evident from drill hole measurements taken prior to opening of the facility. This capacity is of low, unsustainable yield which is insufficient for domestic or animal use. Water for these uses is generally piped in from Ogallala resources east of this area.

Groundwater quality is poor as indicated by samples analyzed by the City of Hobbs in February of 1990, which was prior to the opening of the facility. Total dissolved solids averaged greater than 100,000 ppm, with the low being 34,430 in well 2a and the high being 251,140 in well 1a which is nearest Laguna Toston. This water would not be of beneficial use for domestic or livestock use.

Brine water disposed of at the CRT facility dissipates principally through evaporation from pond surfaces. Pits have been excavated into underlying red beds and the clays have been recompacted. Permeabilities of the recompacted clays should be extremely low. Infiltration into the existing groundwater system is not expected to be significant.

#### Loco Hills Water Disposal Co.

Surface and near surface deposits at the Loco Hills Salt Water Disposal facility consist of caliche and sand and caliche. These units average about 10 feet in thickness and are underlain by Triassic red beds. The red beds are composed of red clay, fine-grained interbedded siltstone and sandstone, and silty clay. The thickness of these units is generally less than 300 feet. The Rustler Formation anhydrite, gypsum and limestones underlie these red beds.

Surface drainage in the area is from rainfall runoff toward the south - southwest. Rainfall is generally less than 12 inches per year, although locally heavy rains can occur. There are no permanent drainage streams in the area.

Groundwater movement at the site consists of the downward slow percolation of rain water through the thin caliche/sand zone and into the Triassic red bed sequences. Numerous clay beds of low permeability occur throughout the thickness of the Triassic. Vertical permeability in several of these beds has been measured at a range of  $4.9 \times 10^{-6}$  cm/sec to  $1 \times 10^{-9}$  cm/sec. Seepage rates are calculated to range from .014 gallons per minute per acre to 1.2 gallons per minute per acre. Clay beds are thought to be discontinuous across the area which would permit some vertical migration of infiltrating brine from the disposal site. Migration of waters may thus proceed to the Rustler contact and southeastward down dip. The local hydrologic gradient is approximately 25 to 30 feet per mile (Figure 8).

Recharge to this system is not significant due to low rainfall, and subsurface storage is poor due to lack of porous/permeable media within the Triassic sequence. The result is a lack of any groundwater resources within the site area. The nearest known water resources are approximately nine miles southeast





of the site and four to five miles west of the site.

Groundwater quality from resources outside the site area are generally good, but have a range of total dissolved solids. Wells west of the site measured 2,722 ppm tds. A well six miles northeast of the site had total dissolved solid concentration of 644 ppm. Wells south of the site have a total dissolved solid range of 932ppm to 6882ppm. Water from a well 1 mile south of the site measured 10000ppm chlorides in the Rustler Formation.

Brine water disposed of at the Loco Hills facility dissipates through a combination of evaporation from pond surfaces and slow infiltration into the Triassic red beds. The movement is both vertical and horizontal but at a very slow rate and volume. Southward migration of fluids will proceed in a southerly direction toward existing water resources outside the site area.

#### Parabo, Inc.

Surface and near surface deposits at the Parabo Inc. salt water disposal facility consist of sand and gravel of the Ogallala Formation. The thickness ranges from 0 to 20 feet. The gravels occupy a linear depression in the underlying Triassic red beds, and represent channel fill during Ogallala time. The regional dip on the Triassic beds is south-southwest, while the channel fill trends east-northeast. Triassic red beds are composed largely of red or green clays with some minor silt fraction.

Surface drainage in the site area is from rainfall runoff toward the south-southwest. Rainfall in the area averages approximately 11 inches per year. There are no permanent streams in the site area.

Ground water movement at the site would normally consist of downward infiltration of rainwater through porous gravels and sands in the Ogallala Formation. It would then move horizontally through these channel ways toward the south at the Triassic boundary. Brine ponds at the site, however, are constructed in mined-out gravel pits which have been excavated into the underlying red bed clays. Clay dikes of the same impermeable material have been constructed and keyed into these clay beds across the mined out channels. This forms a container which is essentially lined with clay. Permeabilities from core samples for the Triassic clays are generally less than  $1 \times 10^{-7}$  cm/sec. Compacted clay dike permeabilities are between  $2.8 \times 10^{-8}$  and  $3.5 \times 10^{-9}$  cm/sec. Brine water is therefore confined within the pit boundaries (Figure 9).

Brine water disposed of at Parabo dissipates through evaporation from the pond surfaces. Infiltration into the underlying formations should not occur because of the impermeable properties of the clays within the Triassic rocks and compacted dike material. Escapes of water can and have occurred at the site, through overtopping of the dikes and leaks through the dikes in areas of poor construction. These incidents have been detected through on-going monitoring of pond levels and measurements of the extensive network of monitoring holes drilled around the site. Remedial actions have been taken and there is no threat to ground water resources in the area.

#### Wildlife

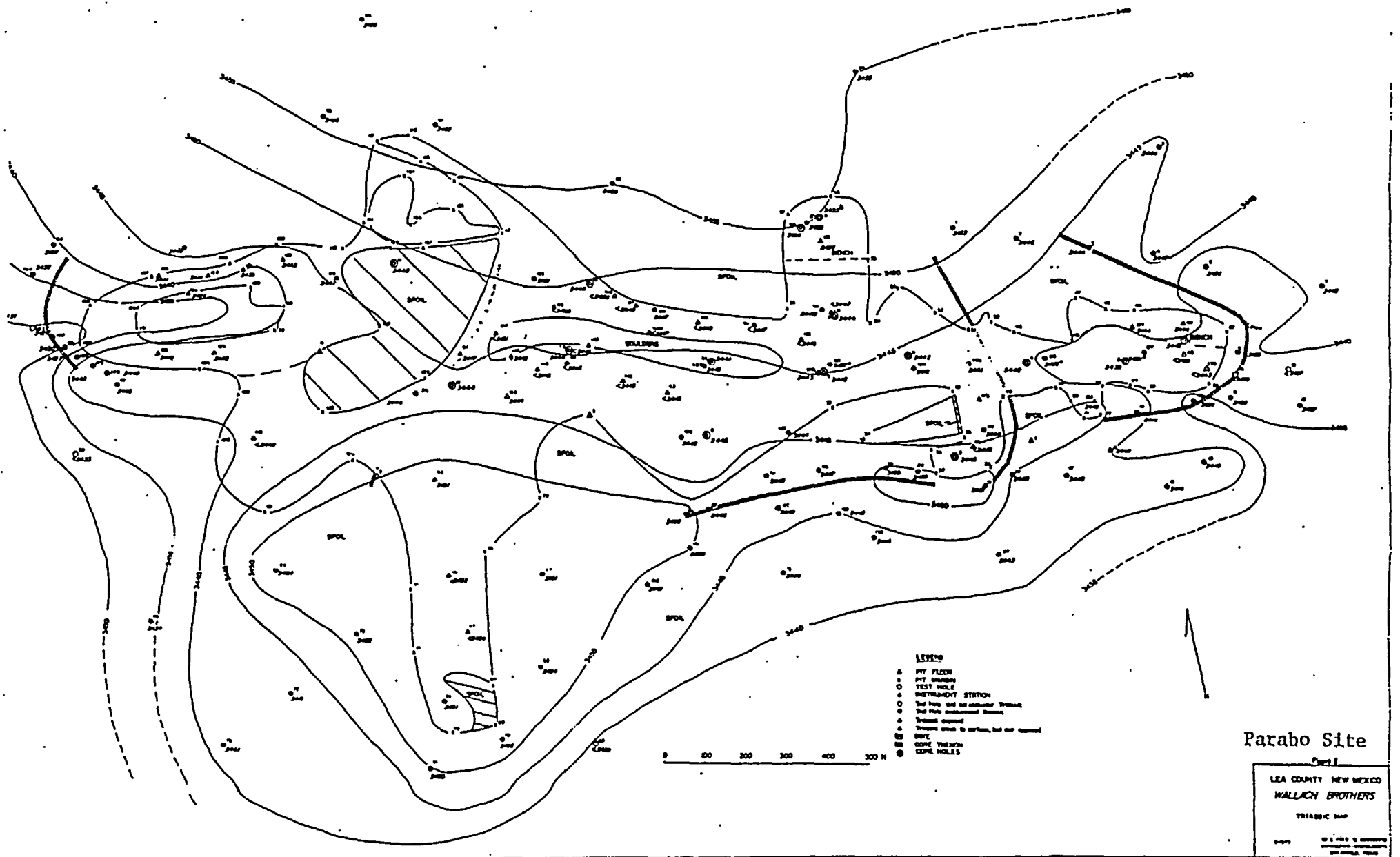


Figure 9:

Source: NMOCD Application



Wildlife found in the areas addressed under the proposed action are associated with two habitat types; mesquite grasslands and shinnery oak dune. Comprehensive species lists for these two habitat types may be found in the East Roswell Grazing Environmental Impact Statement (1979), available in the Roswell District Office and the Carlsbad Area Office.

Bird species have the greatest potential for being affected by the proposed action. The area is in a migratory flyway and has waterfowl and shorebirds passing through in fall, winter and spring. These species rely on fish, amphibians, snails and aquatic vegetation for food. The Pecos River, Lake McMillan, Lake Avalon, and flooded playas are all heavily used by migrant waterfowl and shorebirds.

#### \*Special Status Species

Animal, reptile, fish and amphibian special status species potentially occurring in the area were not considered because of the habitats they are normally found in and the physical barriers associated with the features at the facilities considered in the proposed action. However, the locations identified in this EA potentially provide habitat for fourteen special status bird species which were analyzed in the context of this document.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	FE, SE2
Ferruginous Hawk	<i>Buteo regalis</i>	FC2
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	FE, SE1
Northern Aplomado Falcon	<i>Falco femoralis septentrionalis</i>	FE, SE1
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	FC2, SE2
Interior Least Tern	<i>Sterna antillarum athalassos</i>	FE, SE1
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	FC2
White-faced Ibis	<i>Plegadis chihi</i>	FC2
Long-billed Curlew	<i>Numenius americanus</i>	FC2
Mountain Plover	<i>Charadrius montanus</i>	FC2
Bell's Vireo	<i>Vireo bellii</i>	SE2
Bairds Sparrow	<i>Ammodramus bairdii</i>	SE2
Olivaceous Cormorant	<i>Phalacrocorax olivaceous</i>	SE2

Brown Pelican

*Pelicanus occidentalis*

SE2

Abbreviations:

FE = Federal Endangered

FC2 = Federal Category 2

SE1 = State Endangered Group 1

SE2 = State Endangered Group 2

The locations identified in the proposed action potentially provide habitat for four Federally endangered bird species: the bald eagle, peregrine falcon, Aplomado falcon and Interior least tern.

The bald eagle migrates and winters along the middle Pecos valley (Hubbard, 1985). Wintering bald eagle habitat in this area includes grasslands and shrublands to aquatic sites at lower elevations. Numbers build up, gradually in November and December, peaking in January and February, followed by a decline and exodus in March. Potential use areas in relation to this EA would be habitat along the Pecos River and around the larger playa lakes.

The peregrine falcon occurs in migration and winter essentially statewide, but mainly west of the eastern plains (Hubbard, 1978). Major habitat use areas include steep-walled canyons, high cliffs, rivers, marshlands and deserts. Fewer than half dozen confirmed sightings have been recorded in this area in recent years. Birds are usually observed once and never seen again.

The Aplomado falcon is rare in the State and was historically found from the Guadalupe Mountains west. It prefers open yucca desert grasslands.

The interior least tern has historically nested on Bitter Lake within the Bitter Lake National Wildlife Refuge. In other areas, suitable nesting habitat exists in the form of sandbars and spits along the Pecos River and wide alkali flats in the Pecos Valley.

Socioeconomics

The oil and gas industry is the largest employer in the study areas, and the largest generator of both personal income and total dollar output. Detailed descriptions of socioeconomic conditions in southeastern New Mexico can be found in the Draft Carlsbad Resource Area Resource Management Plan Environmental Impact Statement (1988, p. 3-33 through 3-38 and 3-3 through 3-9) and in the Environmental Assessment on Oil and Gas Leasing in the Roswell District, BLM (1981, p. 2-24 through 2-28).

Reasonably Foreseeable Future Actions

The volumes of produced water from Federal wells in the area will increase in the future, requiring more disposal approvals. This will result from several reasons:

--The amendment of 43 CFR 3103.4-1, "Promotion of Development, Reduction of Royalty on Stripper Wells", effective October 1, 1992 (Federal Register.

August 11, 1992. p. 35968 - 35979) will allow continued operation of Federal stripper wells that would formerly have been abandoned for economic reasons. These wells can produce large volumes of water. A high percentage of the wells in southeastern New Mexico are stripper wells.

--This same amendment may stimulate development drilling on qualifying Federal leases due to lower royalty rates. A high percentage of Federal leases in southeastern New Mexico may qualify for these reductions. Each new well that is drilled will require produced water disposal.

--Because nationwide exploration is at an all-time low at the time of preparation of this EA, a future increase in exploration is likely.

#### IV. ENVIRONMENTAL IMPACTS

##### A. Impacts of Alternative A: Proposed Action

Disposal of produced water at the three subject facilities has been taking place, and will continue to take place, under State oversight, in consultation with the U. S. Fish and Wildlife Service. The presence of Federal produced water will not change the nature of the physical impacts of these facilities. Increases in volume could affect the intensity of these impacts in some situations.

##### Geology

The geology of the study areas surrounding each of the three facilities would be unaffected by implementation of this alternative. The presence of produced water from Federal wells in these facilities will not alter the configuration, content, or character of the rocks.

##### Fluid Minerals

Implementation of this alternative will have no physical impacts on the occurrence of fluid minerals or on reservoir systems in the study areas. Exploration for and development of fluid minerals in the study areas may increase, due to lower haulage costs which are critical to the continued profitability of marginal ("stripper") wells. The Federal government is currently trying to encourage the continued production of oil from Federal stripper wells through the recently approved "Promotion of Development, Reduction of Royalty on Stripper Wells", effective date October 1, 1992 (Federal Register, August 11, 1992).

##### \*Air Quality

The proposed action complies with existing air quality regulations. The proposed action will not impact air quality in excess of regulatory standards.

##### \*Hazardous Materials

The proposed action complies with existing State regulations. The State regulatory agencies do not require testing of produced water before disposal.

Potential exists for off-site migration of contaminants at all three facilities. Any off-site migration at CRI would have the potential for affecting the environment of Laguna Toston. Off-site migration at the Loco Hills facility would have little potential to affect groundwater or surface water. Off-site migration at Parabo would have potential to affect groundwater. Monitoring wells at Parabo have detected migration from an evaporation pond. The fluids are being collected and pumped back into the facility. No groundwater contamination has been reported.

#### \*Hydrology and Water Quality

The continued disposal of Federal oil field brine waters at the CRI, Loco Hills and Parabo facilities will not adversely affect any potable ground water resources; disposal of produced water from state and fee wells will continue. Water resources for domestic and stock use do not occur in the areas of the CRI and Loco Hills sites. Any infiltration into underlying sediments will slowly continue. At CRI infiltration is not expected to be significant. Any infiltration that did occur would eventually move into Laguna Toston but would not impact the quality of water within this playa. Infiltration at Loco Hills will continue through the thick Triassic sequence and southward from the site, but will not impact any known water resources. Brines at Parabo will continue to evaporate and will remain confined as long as there is no overtopping of the dikes and no breaks occur in the facility. Under these conditions there should be no impact to water resources. Detection systems are in place and have worked when these incidents have happened. Remedial actions have been taken and no water resources were affected.

#### Wildlife

The three waste water disposal facilities studied in this EA have made provisions to protect wildlife. All three facilities are fenced. The main impact would be to bird species, particularly waterfowl and shorebirds.

Two of the facilities operate on a 24-hour basis, with floodlights and vehicular activity which tends to disrupt bird use. The third facility, Parabo, does not routinely receive water shipments between about midnight and early morning, but does receive shipments during these times occasionally. All pits containing oil and hydrocarbon residues are netted to prevent birds from landing on their surface. No hydrocarbons are discharged into the evaporation ponds. It is anticipated that brine water discharged into these evaporation ponds will range from 50,000 to over 100,000 ppm chlorides. The New Mexico Environmental Division has analyzed water samples from natural salt playas in this part of New Mexico which measured up to 190,000 ppm TDS. These playas were being used by waterfowl without any documented detrimental effects from the brine concentrations.

Another bird deterrent used by some of these facilities on their evaporation ponds is plastic flagging, which is suspended over the evaporation ponds.

The three facilities are inspected by the New Mexico Oil Conservation Division on a regular basis. U. S. Fish & Wildlife Service Special Agents periodically inspect the facilities to ensure compliance with wildlife mitigation measures. Any dead migratory birds would constitute a violation of the Migratory Bird Treaty Act and could result in substantial fines. At this time, USF&WS

Regional policy for migratory bird protection at these facilities is to request flagging of evaporation ponds (Tom Lane, personal communication, October 13, 1992).

#### \*Special Status Species

Because the subject facilities will continue to dispose of produced water from state and fee wells regardless of whether or not disposal of Federal produced water is authorized, water compositions and surface areas of the evaporation ponds will be virtually unchanged. The principal change would be in the depth of the water in the evaporation ponds. As a result, none of the special status species potentially occurring in the areas identified in the proposed action would be detrimentally affected by implementation of the proposed action. The netting provided by the facilities over the oil separation pits and tanks would prevent the bird species from coming into contact with these substances. The flagging suspended over the brine evaporation ponds would deter most of the birds from landing on the ponds that are so equipped. The 24-hour a day, or nearly 24-hour a day, human disturbance factor would also tend to drive the birds away from the facilities. Monitoring of the facilities by USF&WS and NMOCD would identify the need for any additional mitigative measures.

#### Socioeconomics

Economic impacts of implementation of this alternative may include:

--An increase in income to owners of these facilities due to increased volumes of produced water received from newly permitted Federal wells.

--Possible fines to owners of these facilities by USF&WS if dead migratory birds are found in the evaporation ponds, with subsequent increased costs resulting from any more intensive mitigation requirements imposed by the NMOCD - the regulatory agency with jurisdiction. If stronger NMOCD mitigation requirements are imposed and the owners choose not to comply, they will experience a loss of income from loss of produced water from Federal wells due to denial of future applications and rescission of existing approvals.

--Increased costs could result if NMOCD were to require Controlled Recovery to install more monitoring wells and perform more detailed water quality testing. Any increased testing requirements by NMOCD would increase costs to Loco Hills and Parabo. These analyses are expensive, and could combine to produce a significant cost increase.

--Because permitting the use of these facilities is similar to the current situation and requires no substantial changes in the distances that water is hauled, costs to oil and gas producers and income to water hauling firms should increase moderately as the number of producing Federal wells increases, and as the volumes of water produced by stripper wells increases.

--Increased volumes of produced water resulting from increased drilling and longer producing lives of wells due to the Royalty Reduction amendment could result in more jobs within the industry.

B. Impacts of Alternative B: No Action

Geology

The geology of the study areas surrounding each of the three facilities would be unaffected by implementation of this alternative. The absence of newly permitted produced water from Federal wells in these facilities will not alter the configuration, content, or character of the rocks.

Fluid Minerals

Implementation of this alternative will have no physical impacts on the occurrence of fluid minerals or on reservoir systems in the study areas. Exploration for and development of fluid minerals in the study areas may slow down due to possibly longer haulage distances, resulting in increased costs to operators. This could result in shutting in or abandonment of marginal ("stripper") Federal wells. The Federal government is currently trying to encourage the continued production of oil from Federal stripper wells through the recently approved "Promotion of Development, Reduction of Royalty on Stripper Wells", effective date October 1, 1992 (Federal Register, August 11, 1992). There could be an increase in the number of disposal wells, both for on-lease use and commercial use.

\*Air Quality

The no action alternative has no impact on air quality.

\*Hazardous Materials

These facilities will probably continue to receive and dispose of produced water from state and fee lands; denial of new applications to dispose of produced water from Federal wells will have no positive impacts. Denial of permission to dispose of Federal produced water at these facilities would likely result in an increase in the amount of illegal dumping.

\*Hydrology and Water Quality

There will be no impacts to water or water quality; disposal of state and fee brine waters will continue.

Wildlife and \*Special Status Species

There would be no detrimental affect to wildlife or Special Status Species under this alternative because the facilities would not be used to dispose of produced water from Federal oil and gas wells. There would be no positive affect to wildlife or Special Status Species because of continued disposal of produced water from State and Fee oil and gas wells.

Socioeconomics

Economic impacts of implementation of this alternative may include:

--Decreased income for owners of these facilities, due to the denial of applications to dispose of water from Federal wells. This may be a

significant loss of income.

--Increased costs to Federal oil and gas producers as a result of an increase in distance that their water must be hauled for disposal.

--Increased income for water haulage firms as a result of an increase in distance that water from Federal wells must be hauled for disposal.

### C. Mitigation Measures

#### Alternative A: Proposed Action

Mitigation measures to be adopted under this alternative are:

\* BLM will recommend the following general mitigative measures to NMOCD, the regulatory agency with jurisdiction. These recommendations will not be stipulations for approval of individual NTL-2B applications:

1) Require all three private waste water disposal facilities to flag their active evaporation ponds to deter migratory birds, in conformance with current USF&WS regional policy.

2) To regularly monitor groundwater quality at all three facilities by analysis of samples from monitor wells to ensure that contamination of groundwater does not occur.

3) To inform BLM of any wildlife protection or groundwater quality problems as they occur.

Mitigative measures previously considered in this EA, but not included in the final version in this form, were:

1) Because of the size of the evaporation ponds at these facilities, netting is expensive and in some cases impractical. At the time of this study, mitigation is by measures agreed upon by the NMOCD and the U. S. Fish & Wildlife Service, which include netting of all pits that contain oil, flagging of evaporation ponds as needed, and periodic inspections of these disposal facilities the U. S. Fish & Wildlife Service. To ensure protection of wildlife and Special Status Species, BLM field inspectors may periodically check the facilities for wildlife deaths in the evaporation ponds. If BLM or USF&WS finds wildlife fatalities in a site's evaporation ponds, BLM has the right to require more stringent mitigation measures. These measures may include, but are not limited to, year-round flagging of all pits and ponds, or full netting of all pits and ponds. The mitigation measures to be imposed will be determined on a site-specific basis, and will be discussed with USF&WS, NMOCD, and the facility owners so that the best method of protecting wildlife at the affected site will be selected. If the owner of a disposal facility chooses not to comply with the selected mitigation requirements, permission to dispose of Federal produced waters at that facility can be rescinded.

2) To ensure protection of any groundwater, each site will notify the appropriate BLM resource area office in advance of testing of monitor wells so

BLM field inspectors can witness the testing if they so choose. Inspectors will randomly witness these tests as time permits.

3) To ensure protection of any groundwater, BLM will arrange for the NMOCD to notify BLM of any problems encountered with water quality of monitor well samples. If mitigative measures are required, they will be analyzed and selected on a site-specific, case-by-case basis, in consultation with NMOCD. If the owner of a disposal facility chooses not to comply with the selected mitigation requirements, permission to dispose of Federal produced waters at that facility can be rescinded.

4) Require additional monitoring wells at CRI, with periodic testing to include (but not limited to) benzene, ethylbenzene, toluene, xylene, and VOCs. The Parabo and Loco Hills facilities have adequate monitoring well coverage, but should also be periodically tested for the above hazardous substances.

Proposal number one, to require flagging, was modified to the final form to conform to existing U. S. Fish and Wildlife Service (USF&WS) Regional policy and to rely upon the NMOCD, who have legal jurisdiction, for the regulation of these facilities. Proposal two, to require notification of BLM when monitor wells were to be sampled, was dropped because the NMOCD has jurisdiction and is already monitoring sampling. Proposal three, to have NMOCD notify BLM of any problems, was finalized in slightly modified form. Proposal four, to require monitoring wells at Controlled Recovery with periodic testing for specific toxic water components, was modified to request NMOCD, the agency with jurisdiction, to continue to monitor groundwater quality and inform BLM of any problems.

#### Alternative B: No Action

Because no new applications for disposal of produced water would be approved at these facilities under this alternative, no mitigative measures would be required.

#### D. Residual Impacts

##### Alternative A: Proposed Action

Implementation of the Proposed Action would allow continued disposal of Federal produced water at these facilities, which would continue to dispose of produced water from state and fee wells regardless of any decision made by BLM. Residual impacts resulting from the proposed action would include:

--Increased development and recovery of fluid minerals due to lower water hauling costs.

--An increase in income to owners of these facilities due to increased volumes of produced water received from newly permitted Federal wells.

--Possible fines to owners of these facilities by USF&WS if dead migratory birds are found in the evaporation ponds, with possible subsequent increased costs resulting from more intensive mitigation requirements if imposed by NMOCD. If stronger NMOCD mitigation requirements are imposed and the owners



choose not to comply, then they will experience a loss of income from loss of produced water from Federal wells.

--Possible increased costs to Controlled Recovery to install more monitoring wells and perform more detailed water quality testing, if required by NMOCD. Possible increased testing costs to Loco Hills and Parabo, if required by NMOCD. These analyses are expensive, and could combine to produce a significant cost increase.

--Because permitting the use of these facilities is similar to the current situation and requires no substantial changes in the distances that water is hauled, costs to oil and gas producers and income to water hauling firms should increase moderately as the number of producing Federal wells increases, and as the volumes of water produced by stripper wells increases.

--Increased volumes of produced water resulting from increased drilling and longer producing lives of wells due to the Royalty Reduction amendment could result in more jobs within the industry.

Residual impacts to ground water and wildlife would be minimal, due to continued operation of the facilities as disposal sites for state and fee wells.

#### Alternative B: No Action

While implementation of the No Action alternative would halt disposal of Federal produced water at these facilities, disposal of water from state and fee wells would continue. As a result, the principal residual impacts of this decision would be economic. These would include:

--Decreased income for owners of these facilities, due to the denial of applications to dispose of water from Federal wells. This may be a significant loss of income.

--Increased costs to Federal oil and gas producers as a result of an increase in distance that their water must be hauled for disposal.

--Increased income for water haulage firms as a result of an increase in distance that water produced from Federal wells must be hauled for disposal.

Another residual impact could be an increase in the amount of illegal dumping of produced water.

#### E. Cumulative Impacts

Currently over 27,000 wells are producing hydrocarbons in southeastern New Mexico. Total annual production is approximately 62,000,000 barrels of oil, 474,000,000 MCF of gas, and 345,000,000 barrels of produced water. The volume of produced water will go up in the future as fields age and as Federal incentives to leave marginal wells on production longer before abandonment take effect. The need for disposal of these waters will increase.

Disposal of produced water at the three subject facilities has been taking place, and will continue to take place, under State oversight, in consultation

with the U. S. Fish and Wildlife Service. The presence of Federal produced water will not change the nature of the physical impacts of these facilities. Increases in volume could affect the intensity of these impacts in some situations.

Cumulative impacts resulting from the implementation of the proposed action will include:

--Increased development and recovery of fluid minerals due to lower water hauling costs.

--An increase in income to owners of these facilities due to increased volumes of produced water received from newly permitted Federal wells.

--Possible fines to owners of these facilities by USF&WS if dead migratory birds are found in the evaporation ponds, with possible subsequent increased costs resulting from more intensive mitigation requirements, if imposed by NMOCD. If stronger NMOCD mitigation requirements are imposed and the owners choose not to comply, then they will experience a loss of income from loss of produced water from Federal wells.

--Possible increased costs to Controlled Recovery to install more monitoring wells and perform more detailed water quality testing, if required by NMOCD. Possible increased testing costs to Loco Hills and Parabo, if required by NMOCD. These analyses are expensive, and could combine to produce a significant cost increase.

--Because permitting the use of these facilities is similar to the current situation and requires no substantial changes in the distances that water is hauled, costs to oil and gas producers and income to water hauling firms should increase moderately as the number of producing Federal wells increases, and as the volumes of water produced by stripper wells increases.

--Increased volumes of produced water resulting from increased drilling and longer producing lives of wells due to the Royalty Reduction amendment could result in more jobs within the industry.

#### V. INFORMAL CONSULTATION AND COORDINATION

Dan Davis, New Mexico Environmental Division, Santa Fe, New Mexico.

New Mexico Department of Game and Fish, T/E Species Handbook.

Johnny Robinson. New Mexico Oil Conservation Division, Artesia Office (District II).

Jerry Sexton, New Mexico Oil Conservation Division, Hobbs Office (District I).

U. S. Fish and Wildlife Service, Albuquerque, New Mexico.

Mike Williams. New Mexico Oil Conservation Division, Artesia Office (District II).

## VI. LIST OF PREPARERS

Al Collar, Hazardous Materials Coordinator: B. S. in geology, Arkansas Technical University (1982); 8 years geologist, BLM, 2 years Hazardous Materials Coordinator, BLM: Air Quality, Hazardous or Solid Wastes.

Larry LaPlant, Wildlife Biologist: B. S. in wildlife management, University of Montana (1963); 12 years wildlife biologist, Department of the Army, 13 years wildlife biologist, BLM: Wildlife and Special Status Species.

Richard W. Melton, Geologist: B. S. in geology, Arkansas Polytechnic College (1969), M. S. in geology, University of Arkansas (1975); 8 years geologist, U. S. Geological Survey, 9 years geologist, BLM: Hydrology and Water Quality.

James Pettengill, Geologist: B. S. in geology, Allegheny College (1968), M. S. in geology, Northern Arizona University (1971); 10 years geologist, U. S. Geological Survey, 9 years geologist, BLM: Team Leader, Editor, Data Accumulation, Introduction, Proposed Actions and Alternatives, General Setting, Geology, Fluid Minerals, Socioeconomics, Reasonably Foreseeable Future Actions.

Gary Stephens, Geologist: B. S. in geology, Texas Tech University (1972); four years geologist with private industry, seven years environmental scientist with U. S. Geological Survey and BLM, eight years geologist with BLM: Data Accumulation, Introduction, Proposed Action and Alternatives.

## APPENDICES

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APPENDIX A: NTL-2B: DISPOSAL OF PRODUCED WATER.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
CONSERVATION DIVISION

Notice to Lessees and Operators  
of Federal and Indian Oil and Gas Leases  
(NTL-2B)

Disposal of Produced Water

This Notice supersedes NTL-2 and 2A and is issued pursuant to the authority prescribed in 30 CFR 221.4 and 221.32. Lessees and operators of onshore Federal and Indian oil and gas leases or fee and State leases committed to federally supervised unitized or communitized areas shall comply with the following requirements for the handling, storing, or disposing of water produced from oil and gas wells on such leases.

As used in this Notice, the term "District Engineer" means the District Engineer, U.S. Geological Survey. However, in the State of Alaska, the requirements of this Notice will be administered by the Area Oil and Gas Supervisor.

I DISPOSAL REQUIREMENTS AND APPLICATIONS FOR APPROVAL OF DISPOSAL METHODS

By October 1, 1977, all produced water from the above said leases must be disposed of by (1) injection into the subsurface; (2) lined pits; or, (3) by other acceptable methods. All such disposal methods must be approved in writing by the District Engineer regardless of the physical location of the disposal facility. Any method of disposal which has not been approved as of October 1, 1977, will be considered as an incident of noncompliance and will be grounds for issuing a shut-in order until an acceptable manner for disposing of said water is provided and approved by the District Engineer. Lessees and operators are encouraged to file applications in this regard as promptly as possible and are forewarned that applications for approval of existing disposal facilities which are filed after July 1, 1977, may not be timely approved.

No additional approval is required for facilities previously approved by the Geological Survey which involve the disposal of produced water into the subsurface or in lined surface pits. Likewise, no further approval is necessary for existing injection facilities utilized for pressure maintenance or secondary recovery operations.

Lessees and operators who are presently disposing of water in unlined surface pits must timely file applications with the District Engineer for approval of present or proposed disposal methods. Likewise, lessees and operators who are presently disposing of produced water in the subsurface or in lined surface pits without approval of the Geological Survey must also file applications for approval thereof by the District Engineer.

The District Engineer may require modification of any disposal facility prior to October 1, 1977, whenever it is determined that continued use of such facility is endangering the fresh water in the area or is otherwise adversely affecting the environment.

Any application to dispose of produced water must specify the proposed method of disposal and provide the information necessary to justify the method. Required information which must be included in applications for approval of produced water disposal in the subsurface, in lined pits, or in unlined pits is set forth in Sections II, III, and IV, respectively, of this Notice. Additional information may be required by the District Engineer in individual cases. Previous applications filed in response to NTL-2 and NTL-2A which do not meet the data requirements of this Notice must be supplemented or resubmitted.

A single application may be submitted for several leases or facilities provided that (1) the leases or facilities are located in the same field; (2) the produced water is from the same formation or is of similar quality; (3) the volume and source of the water is shown separately for each disposal facility; and, (4) the method of disposal is the same in every case.

## II DISPOSAL IN THE SUBSURFACE

If approval is requested for subsurface water injection in connection with secondary recovery operations or for disposal purposes, the lessee or operator must furnish information which includes:

1. The designated name and number of the proposed disposal well and its location in feet and direction from the nearest section lines of an established survey. The applicable Federal or Indian oil and gas lease number or other permit and/or the ownership of the surface and minerals if other than Federal or Indian.
2. The daily quantity and sources of the produced water and a water analysis which includes total dissolved solids, pH, and the concentrations of chlorides and sulfates.
3. The injection formation and interval.
4. The quality of the fluids in the injection interval, i.e., total dissolved solids.
5. The depth and areal extent of all usable water (i.e., less than 10,000 ppm total dissolved solids) aquifers in the area.
6. The size, weight, grade and casing points of all casing strings, the size hole drilled to accommodate each string, the amount and type of cement, including additives used in cementing each string, and the top of the cement behind each casing string. In addition, bond logs may be required in certain instances.
7. The total and plugged back depth of the well.
8. The present or proposed method of completing the well for injection including the type and size of tubing and packer to be utilized, the setting depth of the packer, anticipated injection pressure, and information concerning any corrosion inhibitor fluid which is to be placed in the tubing-casing annulus.
9. Plans for monitoring the system to assure that injection is confined to the injection interval and measures to be taken should it be necessary to shut-in the disposal system.

In order to be approved, subsurface disposal must be confined (1) to formations which contain water of similar or poorer quality than the injected water or (2) to formations that contain water of such poor quality as to eliminate any practical use thereof.



In general, it will be required that subsurface disposal be accomplished through tubing utilizing a packer which is designed to hold pressure from above and below. The packer should be set at a depth where the casing is protected by competent cement but normally not more than 50 feet above the injection interval. Other procedures or methods of subsurface disposal may be approved by the District Engineer when justified by the lessee or operator.

### III DISPOSAL IN LINED PITS

Where approval is requested for surface disposal in a lined pit, the lessee or operator must supply information which includes:

1. A topographic map of suitable scale which shows the size and location of pit.
2. The daily quantity, sources of the produced water, and a water analysis which includes the concentrations of chlorides, sulfates, and other constituents which are toxic to animal, plant, or aquatic life.
3. The evaporation rate for the area compensated for annual rainfall.
4. The method for periodic disposal of precipitated solids.
5. The type of material to be used for lining the pit and the method of installation.
6. The method to be employed for the detection of leaks and plans for corrective action should a leak occur in the liner.

The material used in lining pits must be impervious, weather-resistant, and not subject to deterioration when contacted by hydrocarbons, aqueous acids, alkalis, fungi, or other substances likely to be contained in the produced water. Lined pits constructed after the issuance of this Notice must have an underlying gravel-filled sump and lateral system or other suitable devices for the detection of leaks. The District Engineer shall be provided an opportunity to inspect the leak detection system prior to the installation of the pit liner.

### IV DISPOSAL IN UNLINED PITS

Surface disposal into unlined pits will not be considered for approval by the District Engineer unless the lessee or operator can show by application that such disposal meets any one or more of the following criteria:

1. The water to be disposed of has an annual weighted average concentration of not more than 5,000 ppm of total dissolved solids, provided that such water does not contain objectionable levels of any constituent toxic to animal, plant, or aquatic life.
2. That all, or a substantial part, of the produced water is being used for beneficial purposes. For example, produced water used for purposes such as irrigation and livestock or wildlife watering shall be considered as being beneficially used.
3. The water to be disposed of is not of poorer quality than the surface or subsurface waters in the area which reasonably might be affected by such disposal or the surface and subsurface waters are of such poor quality as to eliminate any practical use thereof.
4. The volume of water to be disposed of per facility does not exceed five barrels per day on a monthly basis.
5. The specific method of disposal has been granted a surface discharge permit under the National Pollutant Discharge Elimination System (NPDES).

Applications for approval of unlined surface pits pursuant to exception Nos. 1, 2, 3, or 4, above, must include:

1. The daily quantity and sources of the produced water and for exception Nos. 1 through 3, a water analysis which includes total dissolved solids, pH, and the concentrations of chlorides and sulfates.
2. A topographic map of suitable scale which shows the size and location of the pit.
3. The evaporation rate for the area compensated for annual rainfall.
4. The estimated percolation rate based on the soil characteristics under and adjacent to the pit.
5. The depth and areal extent of all usable water (i.e., less than 10,000 ppm total dissolved solids) aquifers in the area.

Where beneficial use is the basis for the application, the justification submitted must contain written confirmation from the user(s) and the water analysis must also include the oil and grease content, temperature, and the concentration of other constituents which are toxic to animal, plant, or aquatic life.

If the application is made on the basis that surface and subsurface fresh waters will not be affected by disposal in an unlined pit, the justification must also include:

1. Analyses of all surface and subsurface waters in the area which might reasonably be affected by the proposed disposal.
2. Maps or plats showing the location of surface waters, fresh water wells, and existing water disposal facilities within two miles of the proposed disposal facility.
3. Reasonable geologic and hydrologic evidence showing that the proposed disposal method will not adversely impact on existing water quality or major uses of such waters; the depth of the shallowest fresh water aquifer in the area and the presence of any impermeable barrier(s).
4. A copy of any State order or other authorization granted as a result of a public hearing which is pertinent to the District Engineer's consideration of the application.

If the application is for disposal pursuant to an NPDES permit, only a topographic map showing the size and location of the pit together with a copy of the approved permit and the most recent "Discharge Monitoring Report" will be required.

#### V GENERAL REQUIREMENTS FOR PERMANENT SURFACE PITS

Lined and unlined pits approved for water disposal shall:

1. Have adequate storage capacity to safely contain all produced water even in those months when evaporation rates are at a minimum.
2. Be constructed, maintained, and operated to prevent unauthorized surface discharges of water. Unless surface discharge is authorized, no siphon, except between pits, will be permitted.

3. Be fenced to prevent livestock or wildlife entry to the pit, when required by the District Engineer.
4. Be kept reasonably free from surface accumulations of liquid hydrocarbons by use of approved skimmer pits, settling tanks, or other suitable equipment.
5. Be located away from the established drainage patterns in the area and be constructed so as to prevent the entrance of surface water.

#### VI TEMPORARY USE OF SURFACE PITS

Unlined surface pits may be used for handling or storage of fluids used in drilling, redrilling, reworking, deepening, or plugging of a well provided that such facilities are promptly and properly emptied and restored upon completion of the operations. Mud or other fluids contained in such pits shall not be disposed of by cutting the pit walls without the prior authorization of the District Engineer. Until finally restored, unattended pits must be fenced to prevent access by livestock and wildlife. Unless otherwise specified by the District Engineer, unlined pits may be used for well evaluation purposes for a period of 30 days.

Unlined pits may also be retained as temporary containment pits for use only in an emergency provided such pits have been approved by the District Engineer. Any emergency use of such pits shall be reported to the District Engineer as soon as possible and the pit shall be emptied and the liquids disposed of in an approved manner within 48 hours following its use, unless such time is extended by the District Engineer.

#### VII DISPOSAL FACILITIES FOR NEW WELLS

With the approval of the District Engineer, produced water from wells completed after the issuance date of this Notice may be temporarily disposed of into unlined pits for a period up to 90 days. During the period so authorized, an application for approval of the permanent disposal method, along with the required water analysis and other information, must be submitted to the District Engineer. Failure to timely file an application within the time allowed will be considered an incident of noncompliance and will be grounds for issuing a shut-in order until the application is submitted. With the approval of the District Engineer, the disposal method

may be continued pending his final determination. Once the District Engineer has determined the proper method of disposal, the lessee or operator will have until October 1, 1977, or 60 days following receipt of the District Engineer's determination, whichever is the longer, in which to make any changes necessary to bring the disposal method into compliance. However, if the disposal method then employed is endangering the fresh water in the area or otherwise constitutes a hazard to the quality of the environment, the District Engineer will direct prompt compliance with the requirements of this Notice.

#### VIII UNAVOIDABLE DELAY

A single extension of time not to exceed three months (six months in arctic and subarctic areas) may be granted by the District Engineer where the lessee or operator conclusively shows by application that, despite the exercise of due care and diligence, he has been unable to timely comply with the requirements of the Notice provided that such delay will not adversely affect the environment.

#### IX REPORTS

All unauthorized discharges or spills from disposal facilities must be reported to the District Engineer in accordance with the provisions of NTL-3.

Beginning October 1, 1978, and thereafter on an annual basis, lessees and operators must submit a report for each facility which includes the total volume disposed of during the reporting period and a current water analysis which provides the same type of information required for approval of the original application. Provided, however, that:

1. Where disposal is approved pursuant to Section IV (4), no annual water analysis will be required.
2. Where disposal is approved pursuant to a NPDES permit, a copy of the required discharge monitoring report may be submitted in lieu of the above annual report.
3. Where a single application was approved for several leases and/or facilities, a composite annual report covering all such leases and facilities may be submitted.

X COMPLIANCE

Compliance with this Notice does not relieve a lessee or operator of the responsibility for complying with more stringent applicable Federal or State water quality laws and regulations, including those which are subsequently promulgated pursuant to the Safe Drinking Water Act (P.L. 92-523), or with other written orders of the Geological Survey.

JAN 1 1976

Date

*John A. Duley*

Acting Area Oil and Gas Supervisor

APPROVED:

*Russell G. Wayland*

Russell G. Wayland  
Chief, Conservation Division

APPENDIX B: NMOCD RULE 711.

**(I) SECONDARY OR OTHER ENHANCED RECOVERY,  
PRESSURE MAINTENANCE, SALT WATER DISPOSAL,  
AND UNDERGROUND STORAGE - Cont'd.)**

Delivery of produced water to approved salt water disposal facilities, secondary recovery or pressure maintenance injection facilities, or to a drillsite for use in drilling fluid will not be construed as constituting a hazard to fresh water supplies provided the produced waters are placed in tanks or other impermeable storage at such facilities.

(b) The supervisor of the appropriate district office of the Division may grant temporary exceptions to paragraph (a) above for emergency situations for use of produced water in road construction or maintenance or for use of produced waters for other construction purposes upon request and a proper showing by a holder of an approved Form C-133 (Authorization to Move Produced Water).

(c) Vehicular movement or disposition of produced water in any manner contrary to these rules shall be considered cause, after notice and hearing, for cancellation of Form C-133.

**RULE 711. COMMERCIAL SURFACE WASTE DISPOSAL FACILITIES (As Added by Order No. R-862, June 6, 1988; Order No. R-8952, June 20, 1989; and Order No. R-9012, October 16, 1989.)**

A commercial surface waste disposal facility is defined as any facility that receives compensation for collection, disposal, evaporation or storage of produced water, drilling fluids, drill cuttings, completion fluids, and/or other approved oil field related waste in surface pits, ponds, or below grade tanks. Such facility will not be allowed to operate unless it has been permitted in conformity with the following provisions:

A. Prior to the construction, reconstruction or enlargement of a commercial surface waste disposal facility, application for a permit or a modification to an existing permit shall be filed in duplicate with the Santa Fe office of the Division and one copy to the appropriate district office. The application shall be accompanied by:

1. A plat and topographical map showing the location of the facility in relation to governmental surveys (1/4 1/4 section, township, and range), highways or roads giving access to the facility site, and watercourses, water wells, and dwellings within one mile of the site;

2. The names and addresses of the landowner of the disposal facility site and landowners of record within one-half mile of the site;

3. A description of the facility with a diagram indicating location of fences and cattleguards, and detailed engineering construction/installation diagrams of any pits, liners, dikes, piping, sprayers, and tanks on the facility, prepared in accordance with Division "Guidelines for Permit Application, Design and Construction of Waste Storage/Disposal Pits;"

4. A plan for disposal of approved waste solids or liquids in accordance with Division rules, regulations and guidelines;

5. A contingency plan for reporting and cleanup of spills or releases;

6. A routine inspection and maintenance plan to ensure permit compliance;

7. A closure plan;

8. Geological/hydrological evidence demonstrating that disposal of oil field wastes will not adversely impact fresh water;

9. Proof that the notice requirements of this Rule have been met;

10. 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; and

11. Such other information as is necessary to demonstrate compliance with OCD rules and/or orders.

B. The applicant shall give written notice of application to the owners of surface lands and occupants thereof within one-half (1/2) mile and a copy and proof of such notice will be furnished to the Division. The Division will issue public notice by advertisement in a paper of general circulation published in the county in which the disposal facility is to be located. For permit modifications, the Division may issue public notice. The applicant may require the applicant to give written notice as above. A person seeking to comment on such application must submit comments with the Division within 30 days of the date of public notice. If there is objection by owners or occupants of adjacent lands, the Director of the Division may set any application for surface waste disposal permit for public hearing.

C. (As Amended by Order No. R-9012, October 1989.) Before commencing construction, all commercial surface waste disposal facilities shall have a surety or cash bond in amount of \$25,000, in a form approved by the Division, conditioned upon compliance with statutes of the State of New Mexico and rules of the Division, and satisfactory clean-up of site at cessation of operation, in accordance with Part J of this Rule. The bond has been secured for a treating plant permit at the location that bond shall be sufficient for the surface waste disposal portion of the facility, providing they are contiguous. If an adequate bond is posted by the applicant with a federal or state agency and bond otherwise fulfills the requirements of this rule, the Division may consider the bond as satisfying the requirement of this Rule. The applicant must notify the Division of any material change affecting the bond filed for the site and must, in any case, report status of their bond annually to the Division.

D. The Director of the Division may administratively issue a permit upon a finding that a complete and proper application has been filed and that no significant objections have been received within 30 days following public notice. All permits shall be revocable, after notice and hearing, upon showing of good cause and are transferable only upon written approval of the Division Director. The permit shall be consistent with the application and appropriate requirements of Division rules and The Oil and Gas Act.

E. All surface waste disposal facility operators shall comply with forms C-117-A, C-118, and C-120-A as required by OCD rules.

F. Each operator of a commercial surface disposal facility shall keep and make available for inspection records for each calendar month on the source, location, volume and type of waste (produced water, acids, completion fluids, drilling fluids, etc.) date of disposal, and hauling company that disposed of fluids or material in their facility. Such records shall be maintained for a period of two (2) years from the date of disposal.

G. Disposal at a surface facility shall occur only when an attendant is on duty. The facility shall be secured when an attendant is present. When loads can be monitored or otherwise isolated for inspection before disposal, no attendant is required.

H. No produced water shall be received at the facility by motor vehicles unless the transporter has a valid Form C-133 Authorization to Move Produced Water, on file with the Division.

I. To protect migratory birds, all tanks exceeding 16 feet in diameter, and exposed pits and ponds shall be screened, netted, covered. Upon written application by the operator, an exception to screening, netting or covering of a facility may be granted by the district supervisor upon a showing that an alternative method will protect migratory birds or that the facility is not hazardous to migratory birds.

J. Additional requirements or restrictions may be imposed by the Division, including but not limited to the following:

1. An operator with a history of failure to comply with Division rules, regulations, and orders, or
2. Site suitability limitations.



**(I-SECONDARY OR OTHER ENHANCED RECOVERY, PRESSURE MAINTENANCE, SALT WATER DISPOSAL, AND UNDERGROUND STORAGE - Cont'd.)**

K. The operator shall notify the Division of cessation of operations. Upon cessation of disposal operations for six (6) consecutive months, the operator will complete cleanup of constructed facilities and restoration of the facility site within the following six (6) months, unless an extension of time is granted by the Director of the Division. Such closure shall be in accordance with the closure plan and any modifications approved by the Division Director and may include removal or demolition of buildings, removal of all tanks, vessels, equipment or hardware, containment and removal of fluids and chemicals, backfilling and grading of pits, removal of contaminated soil, aquifer restoration (if necessary) and reclamation of the general facility site. Prior to release of the bond covering the facility, a representative of the Division will inspect the site to determine that restoration is adequate.

L. Upon showing of proper cause, the Director of the Division may order immediate cessation of any surface waste disposal operation. The cessation will remain in effect until withdrawn, or until an order is issued after notice and hearing, when it appears that such cessation is necessary to prevent waste, to protect fresh water, to protect public safety, or to assure compliance with Division rules or orders.

**J - OIL PURCHASING AND TRANSPORTING**

**RULE 801. ILLEGAL SALE PROHIBITED (As Amended by Order No. R-98-A, July 1, 1952.)**

The sale or purchase or acquisition, or the transporting, refining, processing, or handling in any other way, of crude petroleum oil or from any product of crude petroleum produced in excess of the amount allowed by any statute of this state, or by any rule, regulation, or order of the Division made thereunder, is prohibited.

**RULE 802. RATABLE TAKE: COMMON PURCHASER (As Amended by Order No. R-98-A, July 1, 1952; Revised by O.C.C. June 1, 1968.)**

(a) (Revised by O.C.C. June 1, 1968) Every person now engaged or hereafter engaging in the business of purchasing oil to be transported through pipelines shall be a common purchaser thereof, and shall without discrimination in favor of one producer as against another in the same field, purchase all oil tendered to it which has been lawfully produced in the vicinity of, or which may be reasonably reached by pipelines through which it is transporting oil, or the gathering branches thereof, or which may be delivered to the pipeline or gathering branches thereof by truck or otherwise, and shall fully perform all the duties of a common purchaser. If any common purchaser shall not have need for all such oil lawfully produced within a field, or if for any reason it shall be unable to purchase all such oil, then it shall purchase from each producer in a field ratably, taking and purchasing the same quantity of oil from each well to the extent that each well is capable of producing its ratable portions; provided, however, nothing herein contained shall be construed to require more than one pipeline connection for each producing well. In the event any such common purchaser of oil is likewise a producer or is affiliated with a producer, directly or indirectly, it is hereby expressly prohibited from discriminating in favor of its own production or in favor of the production of an affiliated producer as against that of others and the oil produced by such common purchaser or by the affiliate of such common purchaser shall be treated as that of any other producer, for the purposes of ratable taking.

(b) It shall be unlawful for any common purchaser to unjustly or unreasonably discriminate as to the relative quantities of oil purchased by it in various fields of the state; the question of the justice or reasonableness to be determined by the Division, taking into consideration the production and age of the wells in the respective fields and all other factors. It is the intent of this rule that all fields shall be allowed to produce and market a just and equitable share of the oil produced and marketed in the state, insofar as the same can be effected economically and without waste.

(c) In order to preclude premature abandonment, the common purchaser within its purchasing area is authorized and directed to make 100 percent purchases from units of settled production producing ten (10) barrels or less daily of crude petroleum in lieu

of ratable purchases or takings. Provided, however, where such purchaser's takings are curtailed below ten (10) barrels per unit of crude petroleum daily, then such purchaser is authorized and directed to purchase daily equally from all such units within its purchasing area, regardless of their producing ability insofar as they are capable of producing.

**RULE 803. PRODUCTION OF LIQUID HYDROCARBONS FROM GAS WELLS (As Amended by Order No. R-98-A, July 1, 1952; Order No. R-1081, December 1, 1957; Order No. R-2761, January 1, 1965.)**

All liquid hydrocarbons produced incidental to the authorized production of gas from a well classified by the Division as a gas well shall, for all purposes, be legal production.

For purposes of this rule, all gas produced from a gas well shall be considered to be authorized production with the following exceptions:

(1) (As Amended by Order No. R-2761, January 1, 1965.) When the well is being produced without an approved Form C-104, designating the gas transporter and the oil or condensate transporter for said well.

(2) When the well has been directed to be shut-in by the Division.

(As Amended by Order No. R-2761, January 1, 1965.) In the event a gas well is directed to be shut-in by the Division, both the gas transporter and the oil transporter named on the well's Form C-104 shall be immediately notified of such fact.

**RULE 804. DOCUMENTATION REQUIRED (As Added by Order No. R-6881, February 1, 1982.)**

A. All off-lease transportation of crude oil or lease condensate by motor vehicle shall be pursuant to an approved Form C-104 and shall be accompanied by a run ticket or equivalent document. The documentation shall identify the name and address of the transporter, the name of the operator and of the lease or facility from which the oil was taken, the date of removal, the API gravity of the oil, the observed percentage of BS and W, the volume of oil or opening and closing tank gauges or meter readings, and the signature of the driver. The document shall provide space for recording of the lease number and for signature of the operator or his representative.

After August 1, 1982, all such transportation must be accompanied by documentation sufficient to verify the location of the tanks or facility from which the liquid was removed. The location may be shown on the run ticket or equivalent document or may be carried separately.

B. All off-lease transportation of liquids which may contain crude oil, lease condensate, sediment oil, or miscellaneous hydrocarbons shall be accompanied by a run ticket, work order, or equivalent document, i.e., Form C-117-A. The documentation shall identify the name and address of the transporter, the name of the operator and of the lease or facility from which the liquid was removed, the nature of the liquid removed including the observed percentage of liquid hydrocarbons, the volume or estimated volume of liquids, and the destination.

After August 1, 1982, all such transportation must be accompanied by documentation sufficient to verify the location of the tanks or facility from which the liquid was removed. The location may be shown on the run ticket or equivalent document or may be carried separately.

C. The documentation required under A. and B. above shall be carried in the vehicle during transportation and shall be produced for examination and inspection by any employee of the Division, any State Police officer, or any other law enforcement officer upon identification and request.

Except where the owner and the transporter are the same, one copy of such documentation shall be left at the facility from which the oil or other liquids were removed.

**K - GAS PURCHASING AND TRANSPORTING**  
**RULE 901. ILLEGAL SALE PROHIBITED**

The sale, purchase or acquisition, or the transporting, refining, processing or handling in any other way, of natural gas in whole or in part (or of any product of natural gas so produced) produced in excess of the amount allowed by any statute of this state, or by any rule, regulation or order of the Division made thereunder, is prohibited.

## APPENDIX C: REFERENCES AND SELECTED BIBLIOGRAPHY

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