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PROPERTY DESCRIPTION AND FACT-FINDING REPORT FOR NPR-3

NATRONA COUNTY, WYOMING

ADDENDUM TO
22 AUGUST 1996
STUDY OF ALTERNATIVES FOR
FUTURE OPERATIONS OF
THE NAVAL PETROLEUM AND
OIL SHALE RESERVES
NPR-3
for

U.S. DEPARTMENT OF ENERGY
CONTRACT NO. DE-AC01-96FE64202

GUSTAVSON ASSOCIATES
GEOLOGISTS·ENGINEERS

DISCLAIMER

PROPERTY DESCRIPTION

AND FACT-FINDING REPORT

FOR

NPR-3

TEAPOT DOME FIELD, NATRONA COUNTY, WYOMING

JUNE 30, 1996

FOR

U.S. DEPARTMENT OF ENERGY

Submitted by

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Respectfully submitted by:

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EXECUTIVE SUMMARY

The U.S. Department of Energy has asked Gustavson Associates, Inc. to serve as an Independent Petroleum Consultant under contract DE-AC01-96FE64202. This authorizes a study and recommendations regarding future development of Naval Petroleum Reserve No. 3 (NPR-3) in Natrona County, Wyoming. The report that follows is the Phase I fact-finding and property description for that study.

The United States of America owns 100 percent of the mineral rights and surface rights in 9,321-acre NPR-3. This property comprises the Teapot Dome oil field and related production, processing and other facilities. Discovered in 1914, this field has 632 wells producing 1,807 barrels of oil per day. Production revenues are about $9.5 million per year. Remaining recoverable reserves are approximately 1.3 million barrels of oil. Significant plugging and abandonment (P&A) and environmental liabilities are present.

The Rocky Mountain Oilfield Testing (RMOTC) is the only special asset/liability identified at NPR-3. A summary of our analysis of RMOTC is provided in this report.

There are three types of *highest and best use* of the mineral estate at this time. The first is for generation of income from producing wells. The second is for evaluation of development locations. The third is from generation of income on the balance of the nonprospective acreage by leasing (bonus and rentals). No commercial exploratory prospects are known.

Oil and gas reserves as estimated previously have been reviewed. An update was judged to be necessary and has been performed. This work is not yet considered to be a reserve estimate since economic limits have not yet been considered. A preliminary estimate of Proved Developed Producing reserves from the eight active reservoirs at Teapot Dome is 1.3 million barrels of oil.

Market data were obtained for sales of producing properties, mineral conveyances and oil and gas leasing activity. These were compiled for use in valuing the oil and gas assets present at NPR-3.

All of the above data will be utilized in estimating the Fair Market Value of the mineral rights at NPR-3 under Phase II of this contract.

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INTRODUCTION

The U.S. Department of Energy has granted Gustavson Associates, Inc. a Contract DE-AC01-96FE64202. The work being performed under this Contract is aimed at determining the economic advantages which would accrue to the United States of America under each of the following scenarios:

1. Retention and operation of all or part of the Naval Petroleum and Oil Shale Reserves by the Secretary under Chapter 641 of Title 10, United States Code.

2. Transfer of all or part of the Naval Petroleum and Oil Shale Reserves to the jurisdiction of another Federal agency for administration under Chapter 641 of Title 10, United States Code.

3. Transfer of all or a part of the Naval Petroleum and Oil Shale Reserves to the Department of Interior for leasing in accordance with the Mineral Leasing Act (30 U.S.C. 181 et seq.) and surface management in accordance with the Federal Land Policy and Management Act (43 U.S.C. 1701 et seq.).

4. Sale of the interest of the United States of all or a part of the Naval Petroleum and Oil Shale Reserves.

Ultimately, the results of the work are to be provided in a Final Report as is specified in the Contract. However, in order to provide an early compilation of all available data about the individual properties, namely NPR-2, NPR-3, NOSR-1, NOSR-2 and NOSR-3, Gustavson Associates is herewith presenting the enclosed Report. While not a deliverable item under the Contract, this Report nevertheless will serve as a benchmark for review both by the DOE as well as by the employees of Gustavson Associates.

The DOE officials will have an opportunity at their own discretion to review the data and point to any omissions of data which inadvertently may not have been provided to Gustavson

Associates, and possibly remedy the situation. Concurrently, Gustavson Associates will be able on basis of this report to enter into the evaluation and appraisal phase of the Contract and thereby assume the application of a uniform approach to the widely varying properties.

The Report is organized in three major sections, namely a Property Section which briefly discusses the nature of the property (with regard to the legal status of the mineral interests to be evaluated), surface conditions and access, the geology and geophysics of the property, any production history, any remaining reserves, and the preliminary economics which might govern the extraction thereof. This section is followed by a description of any leasehold equipment on the property, any leads or prospects for future exploration and development, additional surface facilities, potential plugging and abandonment liabilities, as well as any environmental issues. This is concluded by a description of the effects of various taxes.

The second major section describes the current market and oil and gas activities in the surrounding area. Such a market could be expected both to influence the perception of future activities on the subject property as well as to provide guidance for the subsequent appraisal of the property. This section therefore consists of a description of the various types of recent mineral transactions which have taken place in the surrounding area within a reasonable time period of about three years.

Finally, the Report includes a section on the determination of the Highest and Best Use, a function which in accordance with the standards of the appraisal profession, is necessary to conduct *prior* to entering into the actual appraisal of property. On the basis of the Highest and Best Use an appraiser will select the most appropriate approach(es) to estimating the Fair Market Value.

In order to keep the body of the Report relatively brief, a substantial amount of the detail data has been relegated to appendices. References used in preparation of this report are listed in Appendix A. We emphasize again that this is an informal report aimed primarily at gathering and communicating those facts about the property which typically would be considered by the

DOE, by other agencies of the U.S. Government, or by potential private industry purchasers in preparation for the detailed valuation by these parties of the property prior to a potential transfer or purchase. It is the intent (a) to use this data during the immediately following valuation phase, (b) to make amendments or changes to the enclosed data if and when new facts become available, and finally (c) to include this entire Report, as amended, as an appendix to the Final Report to be submitted under this Contract.

1. PROPERTY

This report serves as summary and documentation of the fact-finding study performed by Gustavson Associates on the producing oilfield known as NPR-3, the Teapot Dome Field. This property is located in Natrona County, Wyoming.

1.1 LEGAL STATUS (PROPERTY TYPES)

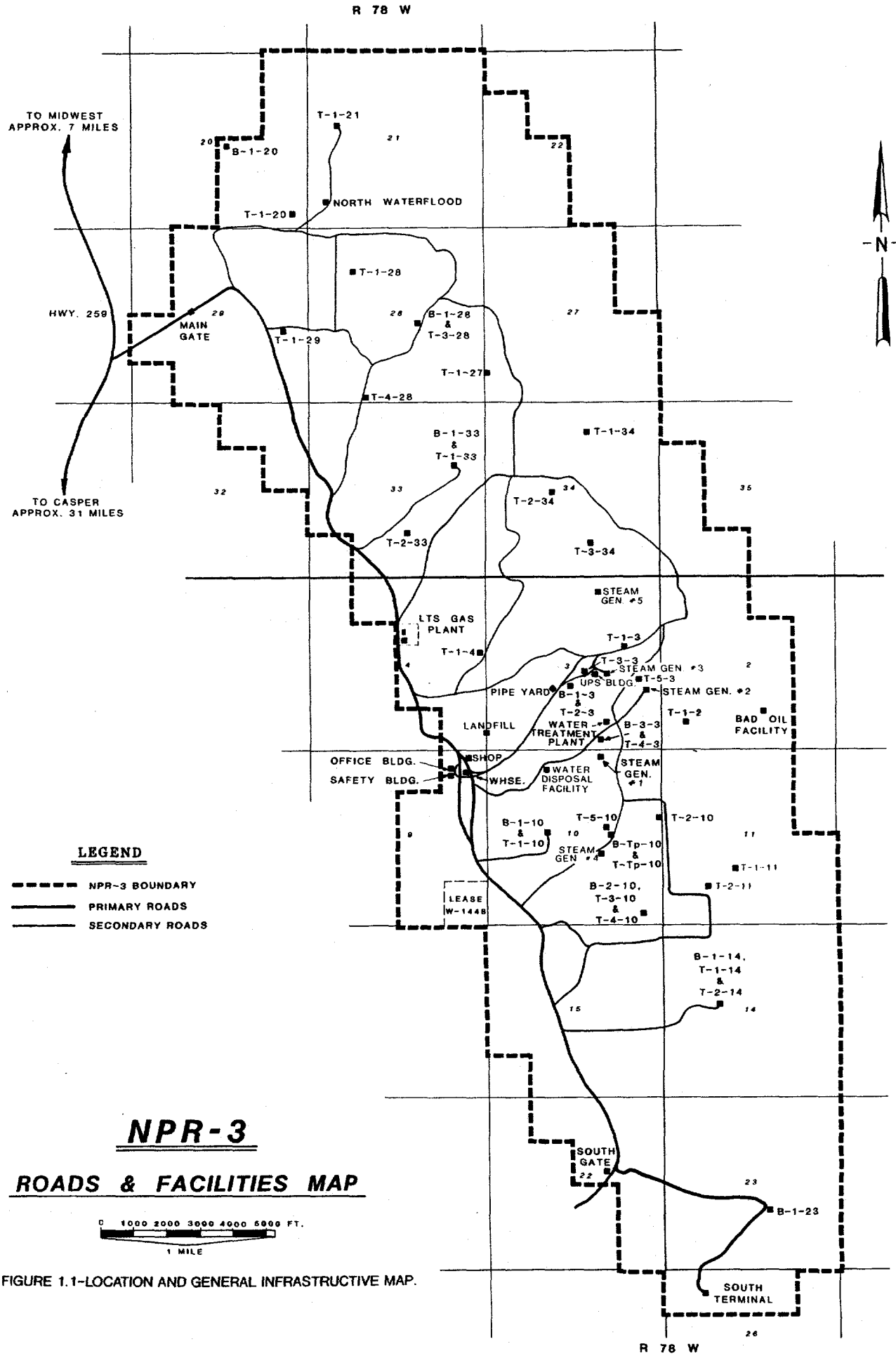
The property described herein includes 9,321 acres, all of which is fully owned by the U.S. government (Figure 1.1). The Department of Energy (DOE) currently operates this field through the services of a contract operator, Fluor Daniel (NPOSR), Inc. Appendix B includes a complete real property description.

NPR-3 was created by President Wilson in 1915 from lands already in the public domain. Originally it consisted of 9,481 acres, but 160 acres were in a school section ceded to the State of Wyoming and were withdrawn.

Teapot Dome represents a complexly faulted, southern closure on the southeast plunging Salt Creek Anticline. Salt Creek Field, the northern closure, is far larger than Teapot Dome. The smaller field came under intense scrutiny in the Harding administration during an investigation by the Senate Committee on Public Lands into leasing of the area by the Department of Interior to private parties under controversial conditions. Eventually the lands were returned by court order to the Federal government.

1.2 LEASEHOLD INTERESTS

There are no leasehold interests (no lessees) at NPR-3. The U.S. government holds a full interest in the surface and mineral rights in the property.



NPR-3

ROADS & FACILITIES MAP

FIGURE 1.1-LOCATION AND GENERAL INFRASTRUCTIVE MAP.

1.3 SURFACE CONDITIONS AND ACCESS

Teapot Dome is approached from Casper, Wyoming by Interstate Highway 25 and State Route 259, both paved. It is about 35 miles north of Casper. The nearest towns are Midwest and Edgerton, which serve the giant Salt Creek Field, operated by Amoco. The entrance to NPR-3 is posted but not locked. Standard gravel and dirt oil field roads service the entire field and numerous buildings, processing facilities, etc.

The surface is rolling-to-flat in the heart of the field. Teapot Creek flows through the property. Spectacular outcrops surrounding the east, west, and south flanks of the field are characterized by steep bluffs. Surface use includes grazing which does not appear to interfere with oil and gas operations. Vegetation is typical of an arid, high plains environment. Hunting is prohibited, and wildlife, including deer and pronghorn antelope, is common.

1.4 GEOLOGY

1.4.1 Introduction

Teapot Dome Field is about 7 x 2 miles in area and includes almost 15 square miles in Townships 38 and 39 North, Range 79 West, Natrona County, Wyoming (Figure 1.1).

The government owns 100 percent of the surface and mineral rights. The field produces sweet and sour crude oil, natural gas (which is reinjected) and natural gas liquids (propane and butane). Original reserves of oil-in-place have been estimated at 235 million barrels, of which only 26.5 million barrels (11 percent) have been produced. Remaining recoverable reserves have been estimated at 1.55 million barrels. This would yield an ultimate recovery of 27.95 million barrels, or about 12 percent of the original oil-in-place.

The mission of NPOSR-CUW is to "manage, develop, operate and maintain the resources of Naval Petroleum Reserve No. 3". As part of the effort to achieve this, 1,312 wells have been

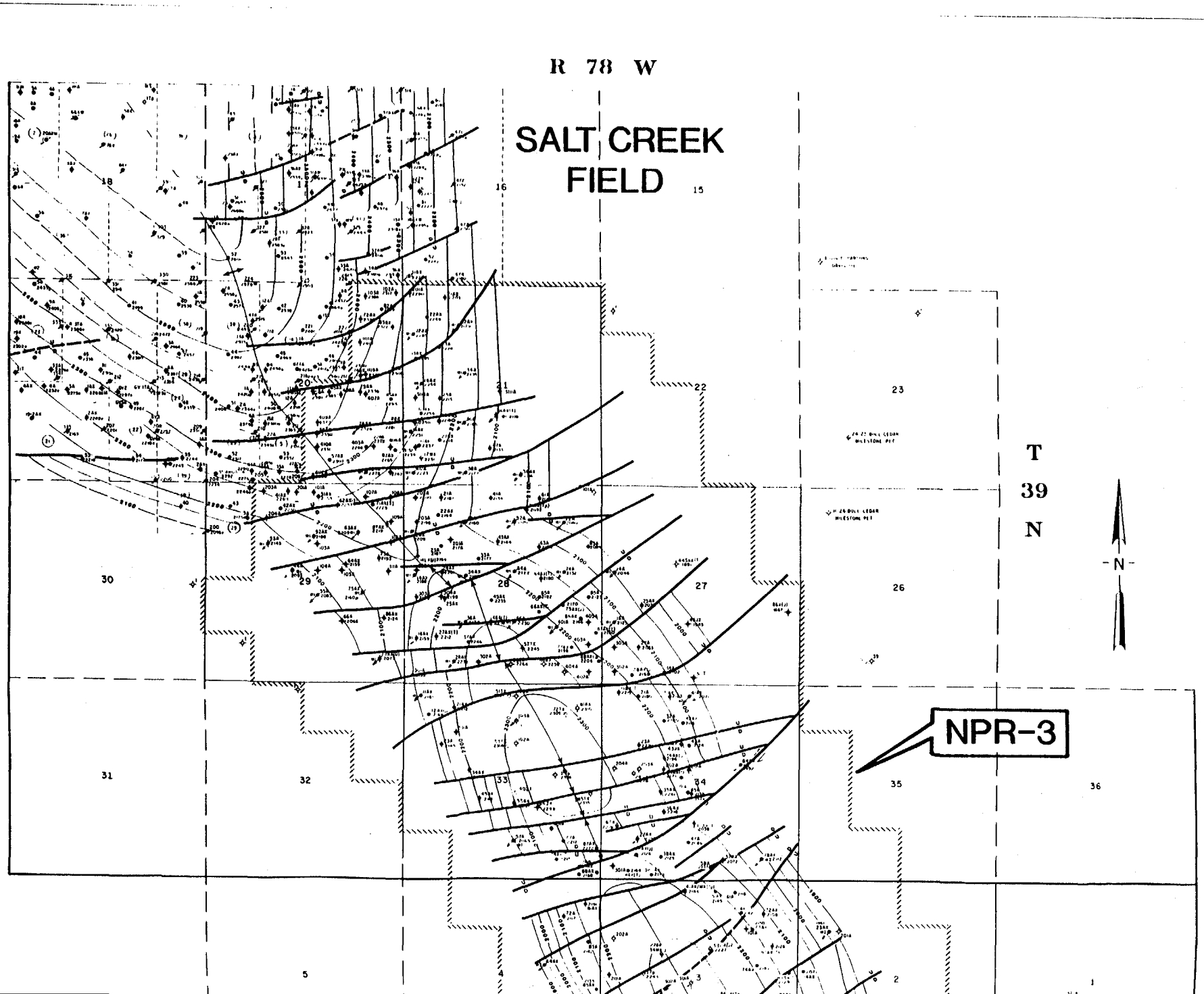
drilled, of which 675 (51 percent) are producers, injectors or disposal wells. Six hundred thirty-seven wells are plugged and abandoned, shut-in or are otherwise not being currently utilized. The NPR-3 business unit is managed and operated by Fluor Daniel (NPOSR), Inc. under a Management and Operations (M&O) Contract.

1.4.2 Petroleum Geology

Located in the southwestern part of the Powder River Basin approximately 35 miles north of Casper, Wyoming, NPR-3 is situated on the eponymous Teapot Dome, an asymmetric, doubly-plunging anticline (Figure 1.2). The field occupies a crestal position on the axis of the south plunge of the larger Salt Creek anticline, on which the giant Salt Creek Field is also located (to the north).

Ten formations have been productive in Teapot Dome Field; eight of these are currently producing (Figure 1.3). Pay zones include the Shannon Sandstone, Steele Shale, Niobrara Shale, Second Wall Creek Sandstone, Third Wall Creek Sandstone, Muddy Sandstone, Dakota Sandstone, Lakota Sandstone (all Cretaceous), Morrison Formation (Jurassic), and the Tensleep Formation (Pennsylvanian). The Shannon, Steele, Niobrara, and Second Wall Creek are the most important of the established reservoirs. Enhanced oil recovery (EOR) operations are in place for the Shannon, Second Wall Creek and the Muddy. A geologic summary of each of the principal pay zones is provided below.

The Upper Cretaceous Shannon includes two separate sequences of vertically stacked sandstones and shales, probably deposited in shallow marine bars. Depth ranges from 200 to 1500 feet; average is about 350 feet. Individual sandstones are 30 to 50 feet thick; the overall sequence thickness is about 150 feet. The sandstones are highly shaly, and porosity and permeability vary widely. Numerous faults and fractures create high permeability trends which enhance production in some parts of the reservoir, but create barriers to fluid flow in others.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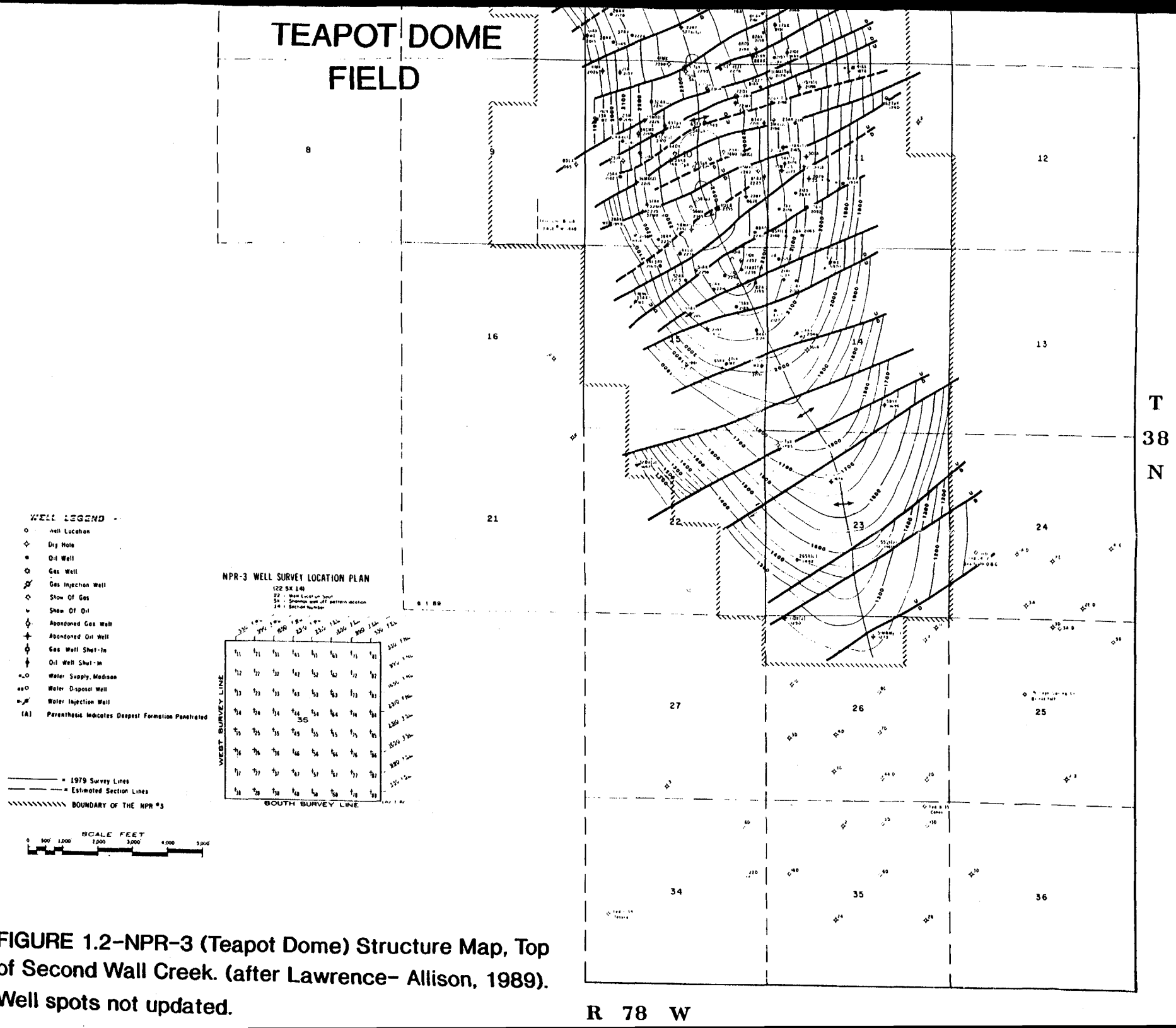
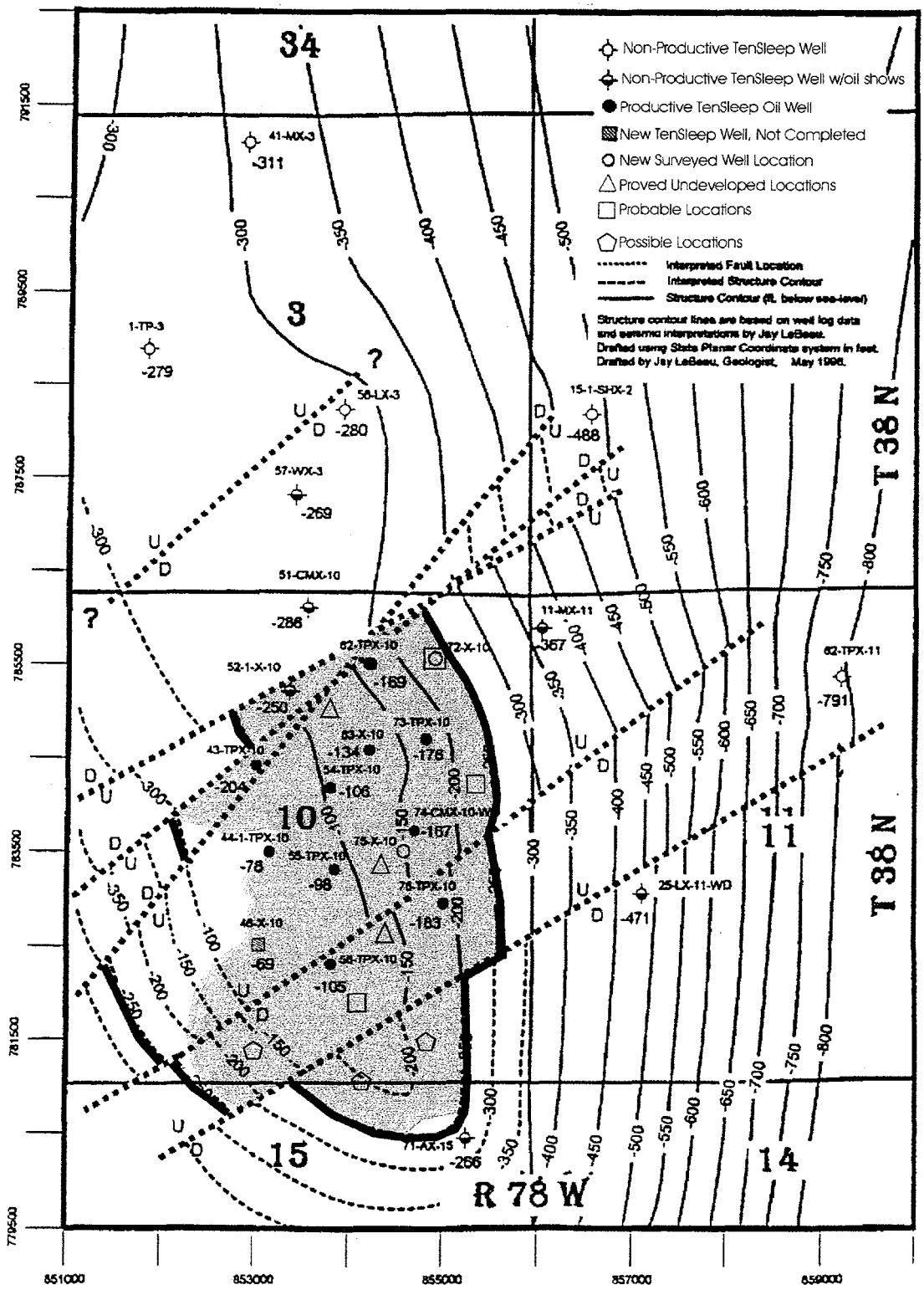


FIGURE 1.2–NPR–3 (Teapot Dome) Structure Map, Top of Second Wall Creek. (after Lawrence– Allison, 1989). Well spots not updated.

FIGURE 1.6

NPR #3: PRODUCTIVE TENSLEEP WELL LOCATION MAP

TENSLEEP STRUCTURE CONTOUR MAP WITH INTERPRETED FAULT LOCATIONS



Maximum area of TenSleep potential

Structure Limit

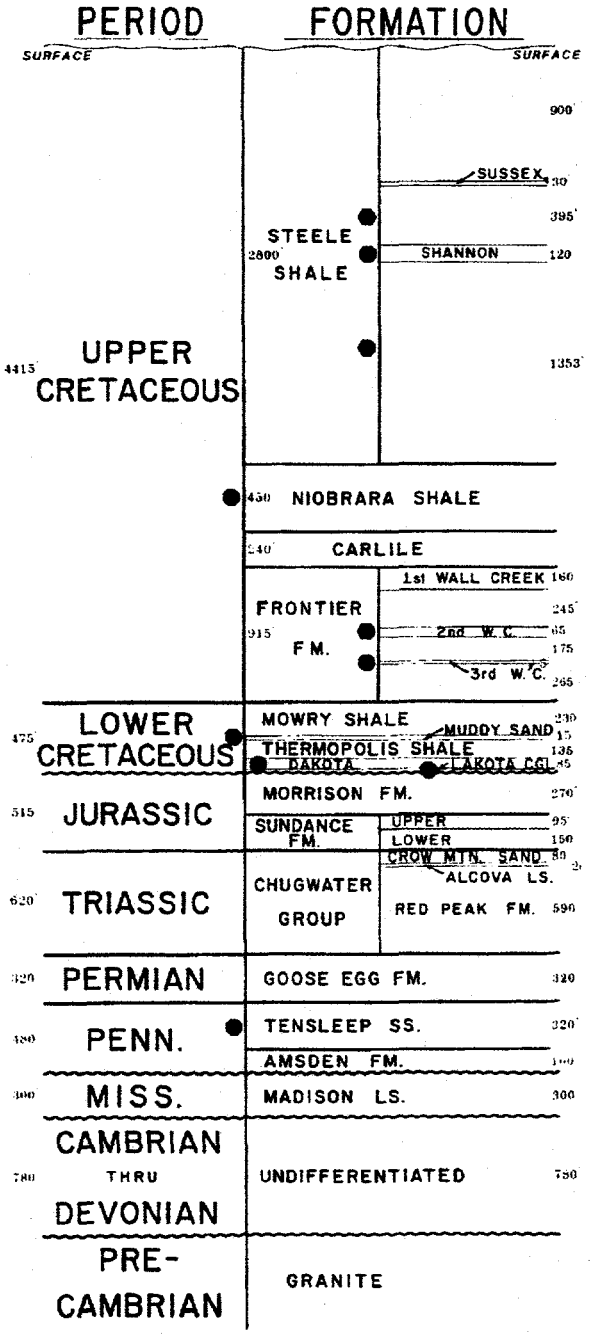
Zero Ø >8%

FIGURE 1.3

GEOLOGIC COLUMN
NPR-3 (TEAPOT DOME)

NATRONA CO., WYOMING T 38, 39 N. R 78 W

●=PRODUCTIVE ZONE



(after Lawrence-Allison)

The Steele Shale produces oil from fractures above and below the Shannon. Wells in the Steele are air-drilled, and take advantage of the preferred orientation of the fracture system. Bentonite layers act as cap rocks for the five individual productive intervals, some of which are sandy shales.

The Niobrara Shale also produces oil from fractures. Situated at about 1900 feet deep, the Niobrara is approximately 450 feet thick. Two productive intervals have been identified. Fractures within each of them are relatively small and are related to major northeast-trending faults that control the direction of the fractures (Figure 1.2).

A member of the Frontier Formation, the Second Wall Creek Sandstone is one of the most important reservoirs at Teapot Dome. Frontier shales are located above and below this reservoir. It ranges from 40 to 80 feet in thickness and is found at a depth of about 3000 feet. Deposited in shallow marine environments, it is a slightly shaly sandstone with good permeability and porosity. Reservoir quality is enhanced by fracturing, but decreases towards the base of the unit. In some wells the reservoir is compartmentalized by thin shales and highly cemented zones within the productive sandstone. Major faults also act to divide the reservoir into isolated fault blocks. Gas and oil are produced from the Second Wall Creek. The former fluid is found in gas caps on the crest of the structure.

The Third Wall Creek Sandstone (also part of the Frontier Formation and sandwiched between Frontier shales) is located at about 3250 feet depth. Deposited in intermittent, nearshore marine bars, the sandstone is thin, typically less than 10 feet thick. Small, generally discontinuous reservoirs are located near the crest of the anticline in the northern part of NPR-3.

The Muddy Sandstone (Lower Cretaceous) produces oil in an area of limited extent where both reservoir development and structural position are favorable. A discontinuous channel sandstone, the Muddy reservoir consists of two sandstones that grade laterally into and are overlain, separated and underlain by shales. Pay zone thickness is up to about 15 feet, and the unit is found at depths of 3600 to 4000 feet.

The Dakota is a minor reservoir located about 150 feet below the Muddy. Dominated by siltstone, it is a shallow water marine deposit that includes poorly developed, fine-grained, low-porosity, discontinuous channel sandstones. Structure and pinchouts of the thin (5 to 10 feet) sandstones control the small Dakota reservoirs.

The Tensleep reservoir includes fine-grained, dolomite-cemented sandstones located at about 5500 feet deep. Two individual sandstones were deposited in near-shore sand dunes and are separated by a thin dolomite. The upper sandstone is about 30 feet thick, the lower is three times thicker. Localized production on the crest of the anticline is thought to be related to a major fault. It produces a sour, medium-gravity (31°API), asphaltic oil that is unique among the NPR-3 crudes. Several new wells have recently been completed in the Tensleep. Two wells that have recently been completed are illustrative of its potential. Well 73-TPX-10 was one of the five best wells drilled in Wyoming in 1995. It was completed for 789 BOPD and paid out in only two months. Well 63-TPX-10 was completed for 699 BOPD and paid out its initial drilling costs in about 2.5 months. The reservoir exhibits an active water-drive, and large volumes of water have been pumped in each well. The theory has been put forth that the source of the water influx to the Tensleep is the deeper Madison formation. Since 1978 the Tensleep pool has yielded over 1.4 million BO and 68 million barrels of water (98 percent water cut). These wells added significantly to the field's proved producing reserves and provided valuable information on proved undeveloped and probable reserves in the Tensleep. Additional Tensleep drilling locations have been identified.

1.5 GEOPHYSICS

A limited volume of seismic data has been acquired over Teapot Dome Field, including a data set shot for Fenix & Scisson, a previous contract operator. These data are 12-fold Vibroseis acquired in 1977. Data quality is good for this vintage.

The data have been interpreted by several DOE contract operator personnel, including, most recently, Dr. Lori LaFreniere (University of Chicago) and Jay LeBeau. These interpretations,

including evaluation of a synthetic seismogram of well 11-MX-11 that ties the data reasonably well, were reviewed briefly by this Appraiser in May, 1996. No formal updating of the mapping has been done since the work of Lawrence-Allison in the 1980s.

The seismic data do not indicate any additional exploratory potential below the Tensleep. Additional development locations beyond those which have been drilled are not suggested either. Further analysis of this data set is not essential. Such development locations and exploratory potential might be established with the acquisition of a modern 3-D survey. Cost of a 3-D survey would be approximately $30,000 to $40,000 per square mile for acquisition and processing. Several square miles would be required to evaluate the entire structure. Interpretation would involve additional costs.

1.6 PRODUCTION HISTORY

Teapot Dome oilfield was discovered in 1890. It has produced about 26.5 million barrels of oil and as of March, 1996, was producing at a rate of 1807 barrels of oil per day (BOPD). For details on the early history of the field's development, the reader is referred to Trexel, 1930.

Production began in 1922, was discontinued after 1927, and renewed in 1959. Prior to 1976 the field yielded about 7.7 million barrels of oil. At that time the Naval Petroleum Reserves Production Act of 1976 was passed, requiring that the NPRs be produced at their maximum efficient rate (MER). DOE has managed NPR-3 at its MER since 1977, and production after 1976 is about 18.8 million barrels of oil. Figure 1.4 is a graphical representation of the total monthly oil production from Teapot Dome over the last ten years. Past and current production data are presented by producing reservoir in Table 1.1.

1.6.1 Shannon Reservoir

The Shannon is the most important producing reservoir at Teapot Dome, with the most oil originally in place (OOIP) at 144 million barrels of oil (MMBO), the most cumulative production

FIGURE 1.4

NPR-3 Total Field Production History

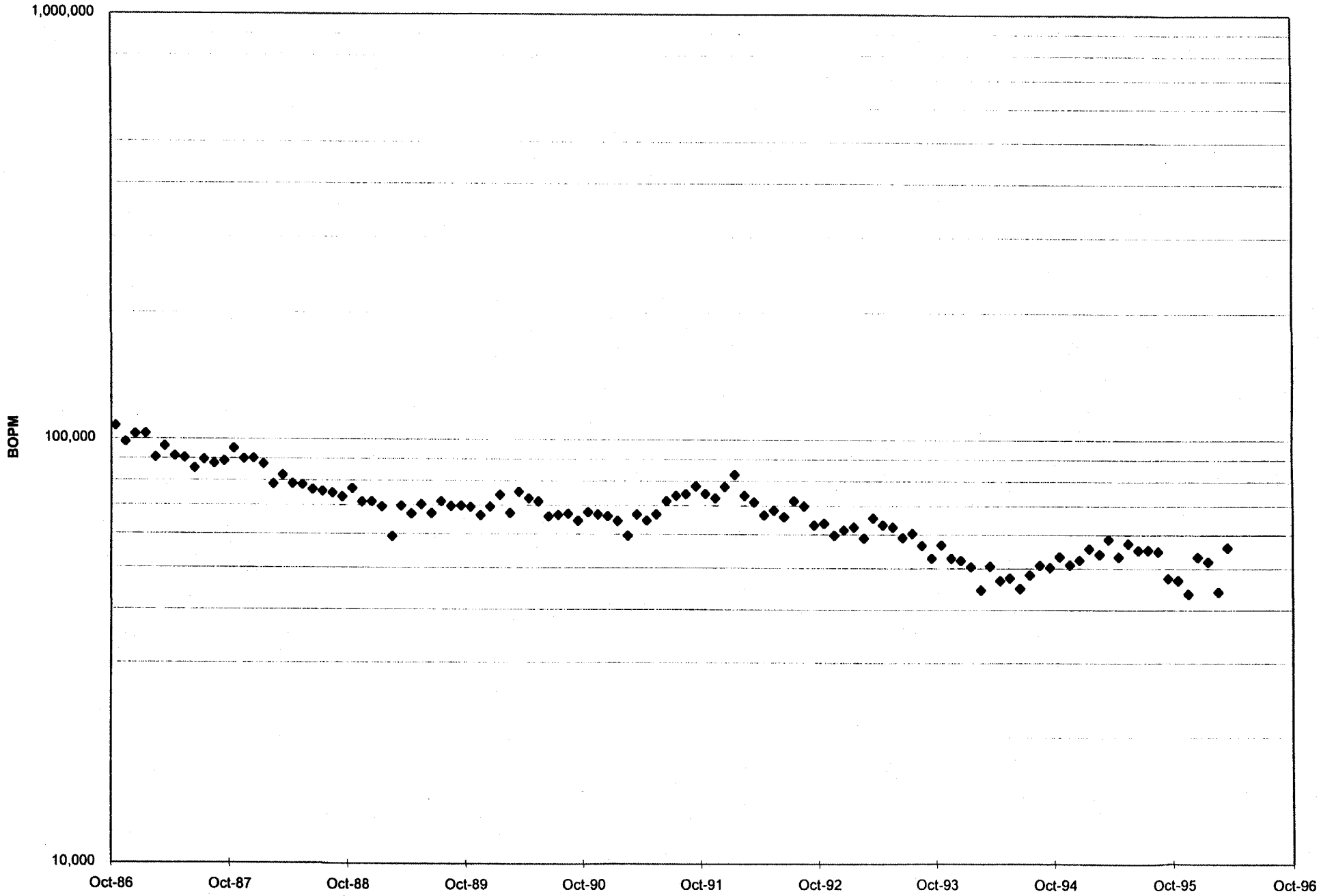


TABLE 1.1

NPR-3 Production Summary

Formation	Cumulative Production, 3/31/96 (BO)	OOIP, MBO	Percent Recovery, 3/96	Production Rate, 3/96 (BOPD)	Number of Producing Wells	Average Rate per Well, BOPD
Shannon	10,151,660	143,850	7.1%	792	430	1.8
Steele Shale	2,384,097	16,427	14.5%	123	55	2.2
Niobrara Shale	1,300,374	8,554	15.2%	96	47	2.0
Northern 2nd Wall Creek	6,220,733	39,210	15.9%	120	77	1.6
Southern 2nd Wall Creek	3,793,484	17,890	21.2%			
3rd Wall Creek	341,638	1,278	26.7%	13	5	2.7
Muddy	745,187	3,950	18.9%	6	5	1.3
Dakota	73,603	652	11.3%	5	3	1.8
Lakota	22,562	84	27.0%	0	0	0.0
Morrison	8,468	?	?	0	0	0.0
Tensleep	1,493,806	3,738	40.0%	650	10	65.0
Total NPR-3	**26,535,612**	**235,632**	**11.3%**	**1,807**	**632**	**2.9**

at 10.15 MMBO, and the most remaining reserves, as discussed in the next section. The Shannon is very shallow, at an average depth across the field of 350 feet. Low initial reservoir energy and its highly-fractured, heterogeneous character have combined to yield relatively low recovery, currently at about 7 percent of OOIP. Several enhanced recovery techniques have been attempted in the Shannon, with varying degrees of success, as discussed below. Steam injection is ongoing.

Current production from the Shannon is 792 BOPD from 430 producing wells, for an average rate per well of only 1.8 BOPD. This includes 68 producing wells in active steamflood patterns, which reportedly contribute 451 BOPD of incremental oil attributed to the steamflood. This represents 6.6 BOPD per well for these 68 wells. The current primary production is thus about 340 BOPD, or less than a barrel a day per well.

1.6.2 Second Wall Creek Reservoir

The other major producing reservoir at Teapot Dome is the Second Wall Creek, which is also the major reservoir at the giant Salt Creek Field located just to the north. The Second Wall Creek at Teapot Dome consists of two accumulations separated by faulting: the Northern Second Wall Creek containing OOIP of 39 MMBO, and Southern Second Wall Creek containing 18 MMBO. Cumulative production has been 6.2 MMBO and 3.8 MMBO, for 16 and 21 percent recovery, respectively, from these two areas. Recoveries are higher in the Second Wall Creek than the Shannon due to greater natural reservoir energy, and better reservoir continuity, resulting in better floodability. Natural fractures, however, limit flood performance in terms of achieving good sweep efficiency. Both waterflooding and gas injection projects have been performed in the Second Wall Creek, as described below. Gas injection is ongoing. The current production rate is 120 BOPD from 77 wells, for an average rate per well of 1.6 BOPD.

The vast majority of the gas currently processed by the gas plant is produced from the Second Wall Creek. This gas yields propane and butane when processed. Liquids recoveries are approximately 0.27 gallons of propane per thousand cubic feet (MCF), and 0.86 gallons of butane per MCF. At the 1995 average gas production rate of approximately 5.5 MCF/D, this results in

1485 gallons of propane and 4730 gallons of butane per day. Almost all the gas is reinjected into the Second Wall Creek, with occasional injection into the Muddy. No gas is currently sold from NPR-3.

1.6.3 Fractured Shale Reservoirs (Steele and Niobrara)

The next most important reservoirs at Teapot Dome are the Steele Shale and Niobrara Shale, with OOIP of 16 and 9 MMBO, respectively. Well productivity is highly variable from both of these zones, depending on the extent of natural fracturing in the area of each well. Cumulative production has been 2.4 MMBO from the Steele, and 1.3 MMBO from the Niobrara, for percentage recoveries of about 15 percent from each. All production is primary. The 102 producing shale wells yield 219 BOPD, for an average of 2.1 BOPD per well.

1.6.4 Tensleep Reservoir

The Tensleep is another important reservoir at Teapot Dome, with almost 4 MMBO estimated OOIP. This reservoir is currently contributing 36 percent of the production from the field, with 650 BOPD. This production is from only ten wells, for the highest production rate per well from Teapot Dome of 65 BOPD per well. A recent successful drilling program has contributed to this rate, with 589 BOPD (as of March 1996) coming from three new wells drilled within the last year-and-a-half at NPR-3. Although the areal extent of the productive Tensleep reservoir is somewhat limited, several additional Tensleep locations are available for drilling, as discussed in the Section 1.7 of this report. The Tensleep produces under natural water drive at a high water cut. The new wells are typified by high initial oil rates (as high as 789 BOPD for Well 73-TPX-10) and a steep decline.

1.6.5 Other Reservoirs

The other less important producing reservoirs at Teapot Dome include the Third Wall Creek, Muddy, and Dakota. These three reservoirs, with a combined OOIP of 6 MMBO, have produced

a total of 1.2 MMBO, and are currently producing 24 BOPD from 13 wells. This represents an average rate per well of 1.8 BOPD. The largest of these reservoirs, the Muddy, is occasionally used for storage of fuel gas for the Shannon steamflood project.

Two other reservoirs, the Lakota and the Morrison, have contributed 31 thousand barrels of oil (MBO) to the field's production. Neither of these two zones has any active producers, nor is expected to have any significant remaining potential.

1.6.6 Enhanced Oil Recovery

Many different enhanced oil recovery pilot projects have been attempted at NPR-3. Notable projects with short project lives include the Shannon polymer flood, the Shannon fireflood, and microbial enhanced oil recovery projects in both the Shannon and Second Wall Creek. The waterflood in the Second Wall Creek was operated for some period as was the Shannon huff and puff, but those projects have been discontinued. Today only gas reinjection into the Second Wall Creek and the Shannon steamflood are ongoing enhanced oil recovery projects.

1.6.6.1 Second Wall Creek Waterflood

Waterflooding began in March 1979 and production from the field peaked the next month but began a rapid decline thereafter. Water injection continued at just under 10,000 barrels of water per day until 1986 when water injection rates were reduced to 4,000 barrels of water per day. The waterflood was discontinued in March, 1994.

1.6.6.2 Second Wall Creek Gas Reinjection

In 1979, gas injection began in the Second Wall Creek sand. Injection rates ranged from 2 to 4 million standard cubic feet per day. The gas production correspondingly increased to similar rates soon after injection began. The gas injection into the Second Wall Creek gas cap has remained basically a gas recycling project with the gas processing plant extracting some liquids.

This project may have some upside if and when the Veterans Administration Gas Storage project begins (discussed in more detail in Section 1.9.3). An additional amount of gas (2 to 7.5 million cubic feet per day) may be injected into the Second Wall Creek Formation. This additional amount of gas may provide some additional liquid recovery.

1.6.6.3 Shannon Polymer/Waterflood

In 1981, a polymer-improved waterflood was conducted in the Shannon reservoir at Teapot Dome with the objective of providing increased reservoir energy with polymer added to reduce the tendency of the injected water to channel through the highly permeable natural fractures. Severe channeling occurred despite the polymer, and the pilot was considered a failure.

1.6.6.4 Shannon Fireflood

An in-situ combustion pilot project in the Shannon was attempted in the early 1980's and was discontinued in fiscal year 1986. As part of this project, steam was used to preheat the reservoir. It was discovered during this preheating that the steam offered potential for additional oil recovery.

1.6.6.5 Shannon Steamflood

A steam drive pilot project was developed in October 1985. Favorable production response supported a steamflood development beginning in 1988 with the ultimate purchase of five steam generators, a water treating facility and the drilling of additional wells. Through 1992, the total capital expense of the steamflood exceeded $18 million.

As of January 1995, there were eight steamflood patterns with steam being injected into both the Upper and Lower Shannon. Incremental oil production from the steamflood during fiscal year 1994 amounted to 43 percent of the total NPR-3 field production (approximately 700 barrels of oil per day). In 1995, steamflood operations were scaled back to the current level, with three

active patterns including 68 producers and 28 steam injectors. This initiated a steep decline in oil production. Two of the five steam generators are inactive. Current incremental production attributed to the Steamflood is 451 BOPD, or about 25 percent of field production. Ultimate recovery in the existing steamflood area is estimated to be nearly 3,000,000 barrels of oil with approximately 2,000,000 barrels attributable to the steamflood. Although the steamflood is currently profitable to operate, the project economics, considering high initial capital expenditures, are poor.

1.6.6.6 Shannon Huff and Puff

The Shannon huff and puff project began in fiscal year 1992. The project included injecting natural gas into a well (NPR-3 was purchasing natural gas for this project), letting it mix with formation fluids for approximately seven days and then producing the well. At the end of fiscal year 1994, the huff and puff project included 27 wells, and was producing an additional 100 barrels of oil per day. Performance was marginal due to natural fractures impacting recovery of injected gas.

The Shannon huff and puff project has been discontinued for several operational reasons. The downhole pumps were experiencing gas lock following a natural gas injection cycle. The only method of releasing the pressure was to open the annulus. To preserve the natural gas, a gathering system was required to collect the annulus gas. In addition, manpower was required to monitor the project. Rather than spend the capital for this collection system and the overhead expense, the huff and puff project was discontinued in September 1995. It is not expected that such capital expenditures would provide a reasonable return.

1.7 RESERVES AND ECONOMICS

1.7.1 Reserve Estimates and Production Forecast

1.7.1.1 Review of Existing Estimate

The most recent reserve report for NPR-3 is the "FY 1995 Oil and Gas Reserves Evaluation" prepared by Fluor Daniel, dated September 1995. This report includes the disclaimer that "the reserves shown are deemed a restatement of previous reserves and not a determination of reserves." Except for newly drilled wells, for which reserves were estimated in the report, reserves were reported based on previous estimates less intervening production. Earlier reports upon which the reserve estimates were based were not available. Further, this report does not include any scheduled prediction of annual future production. Therefore, it was determined by this Consultant that a review of production history by reservoir was required to update reserve estimates and generate a production forecast by reservoir, by fiscal year, for use in Phase II calculations.

1.7.1.2 Methodology for Estimate of Future Oil Production

In order to perform the required estimate, this Consultant constructed plots of monthly oil production data for each producing reservoir at Teapot Dome, as provided by DOE personnel in Casper. These production histories were analyzed in conjunction with information provided by DOE personnel to explain certain features or changes seen in the production plots. The production decline behavior was characterized for each reservoir and projected into the future. Initial projections have been revised based on availability of additional production data and discussions with DOE personnel in Casper. These production history curves with the projected trends are included in Appendix C, and summarized on Table 1.2. Figure 1.5 shows the total field production forecast graphically with the historical production. Note that the forecast on Figure 1.5 does not appear to agree with recent production history. This is due to recent declines in production from several reservoirs being offset by the large increases in production from the

TABLE 1.2

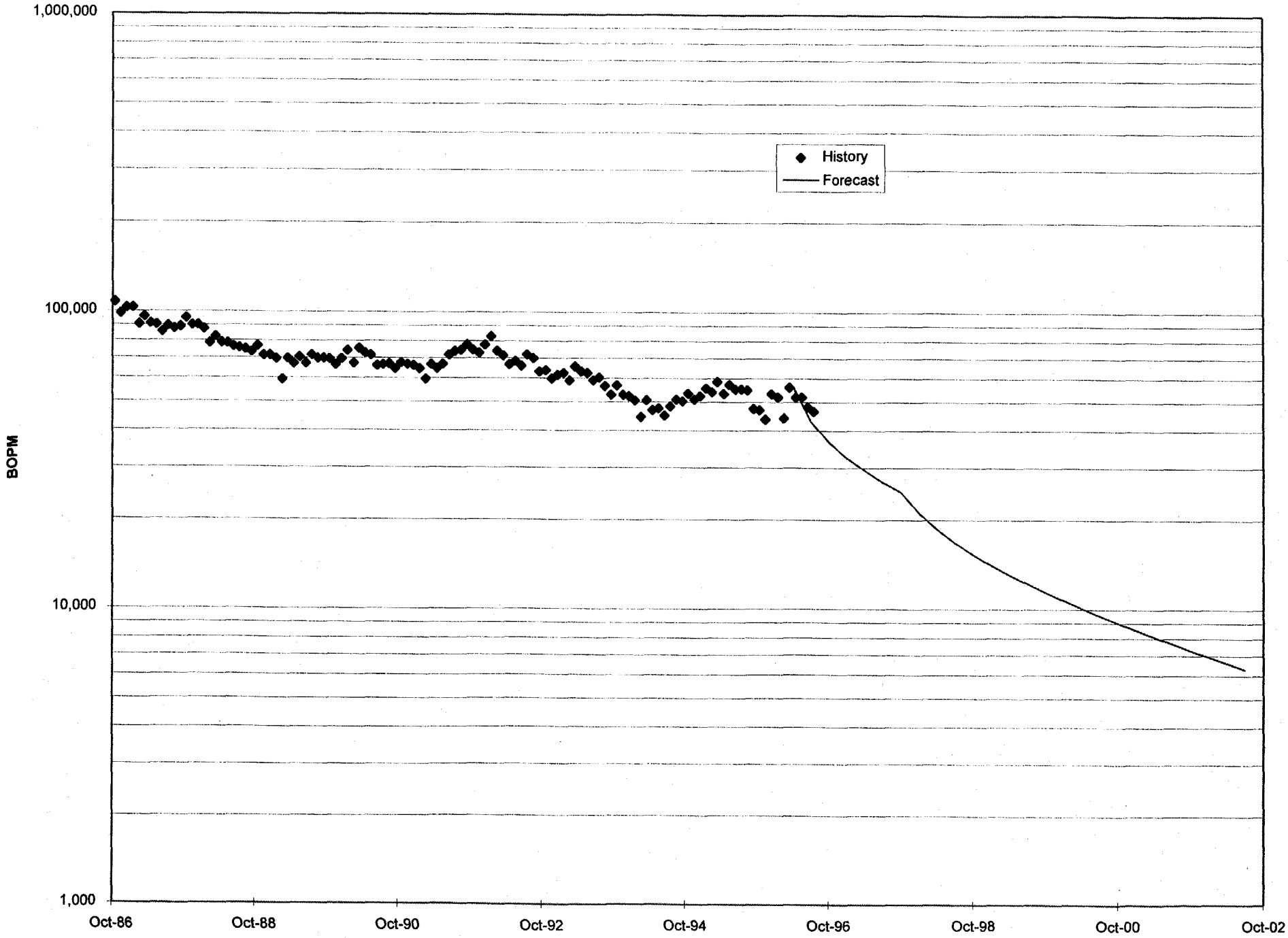
Annual Forecast NPR-3

	Shannon				2nd Wall	3rd Wall				TOTAL	Tensleep				TOTAL	
												New				
	Steamflood	Primary	Steele	Niobrara	Creek	Creek	Muddy	Dakota	Lakota	SWEET	Old	76-TPX-10	73-TPX-10	63-TPX-10	SOUR	TOTALS
D Factor	*various*	*18.1%*	*100.0%*	*120.0%*	*34.9%*	*12.0%*	*15.0%*	*19.0%*	-		*16.3%*	*380.0%*	*380.0%*	*380.0%*		
n Factor	*various*	*0.00*	*0.80*	*0.70*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*		*0.00*	*0.70*	*0.70*	*0.70*		
10/96 Rate	*10,977*	*8,933*	*2,690*	*2,146*	*2,973*	*374*	*179*	*48*	*0*	*28,319*	*1,634*	*529*	*3,430*	*2,558*	*8,151*	
FY97	109,928	98,974	26,636	20,075	30,108	4,223	1,998	522	0	292,464	18,096	4,574	19,508	22,496	64,674	**357,138**
FY98	49,903	82,572	19,114	13,123	21,233	3,744	1,720	432	0	191,842	15,379	2,669	9,661	9,310	37,019	**228,861**
FY99	18,483	68,889	14,718	9,471	14,974	3,320	1,480	357	0	131,692	13,069	1,811	6,076	5,473	26,429	**158,121**
FY00	9,652	57,617	11,890	7,284	10,584	2,951	1,277	296	0	101,552	11,135	1,339	4,300	3,736	20,510	**122,061**
FY01	5,903	47,925	9,864	5,810	7,440	2,609	1,096	244	0	80,892	9,435	1,040	3,243	2,754	16,471	**97,363**
FY02	3,993	39,983	8,405	4,791	5,247	2,313	943	202	0	65,877	8,018	841	2,569	2,148	13,575	**79,452**
FY03	2,880	33,357	7,293	4,043	3,700	2,051	812	167	0	54,304	6,814	699	2,103	1,739	11,354	**65,658**
FY04	2,181	27,899	6,438	3,483	2,616	1,823	701	138	0	45,279	5,805	595	1,769	1,450	9,619	**54,897**
FY05	1,701	23,206	5,719	3,028	1,839	1,612	601	114	0	37,819	4,919	512	1,508	1,228	8,168	**45,987**
FY06	1,367	19,361	5,145	2,672	1,297	1,429	517	94	0	31,882	4,180	448	1,310	1,061	7,000	**38,882**
FY07	1,122	16,152	4,667	2,382	914	1,267	445	78	0	27,028	3,553	397	1,153	930	6,032	**33,060**
FY08	940	13,509	4,275	2,147	646	1,126	384	65	0	23,093	3,027	356	1,028	825	5,235	**28,328**
FY09	795	11,237	3,918	1,939	454	996	330	53	0	19,723	2,565	320	919	736	4,540	**24,262**
FY10	683	9,375	3,620	1,768	320	883	284	44	0	16,977	2,179	290	831	664	3,964	**20,942**
FY11	593	7,821	3,361	1,620	226	783	244	36	0	14,686	1,852	265	756	602	3,476	**18,162**
FY12	521	6,542	3,142	1,497	160	696	211	30	0	12,798	1,578	244	694	552	3,068	**15,866**
FY13	459	5,441	2,932	1,381	112	615	181	25	0	11,147	1,337	224	637	505	2,704	**13,851**
FY14	409	4,540	2,753	1,284	79	545	156	21	0	9,786	1,136	208	589	466	2,399	**12,185**
FY15	366	3,787	2,593	1,197	56	483	134	17	0	8,633	966	193	546	432	2,138	**10,771**
FY16	331	3,168	2,455	1,123	39	430	116	14	0	7,675	823	181	510	403	1,917	**9,592**
20 YR TOTALS	**212,212**	**581,355**	**148,938**	**90,116**	**102,047**	**33,899**	**13,630**	**2,951**	**0**	**1,185,148**	**115,864**	**17,205**	**59,711**	**57,512**	**250,292**	**1,435,441**
10 YR TOTALS	**205,991**	**499,783**	**115,222**	**73,779**	**99,039**	**26,076**	**11,145**	**2,567**	**0**	**1,033,602**	**96,849**	**14,527**	**52,047**	**51,396**	**214,819**	**1,248,421**
Predicted Cumulative Production - 10/1/96	10,282,275		2,402,343	1,315,555	10,033,762	343,954	745,187	73,603	22,562		1,421,004	27,975	63,350	48,826		**26,780,398**
Estimated Ultimate Recovery (20 yrs)	11,075,842	581,355	2,551,282	1,405,671	10,135,809	377,854	758,817	76,554	22,562		1,536,868	45,180	123,061	106,338		**28,215,839**
Estimated Ultimate Recovery (10 yrs)	10,988,049	499,783	2,517,566	1,389,334	10,132,801	370,030	756,332	76,170	22,562		1,517,853	42,502	115,397	100,223		**28,028,819**

NOTE: Economic limit not considered.

FIG 1.5

NPR-3 Total Field Production History and Forecast
(Existing Wells Only)



new Tensleep wells. Forecasts should be reviewed on a reservoir by reservoir basis as presented in Appendix C.

Production was forecast for twenty years from October 1, 1996, with no consideration made at this time for economic limit. The Shannon forecast reflects the steep decline which began in 1995 with the scaling back of the steamflood. The Shannon, Steele, and Niobrara reservoirs, and the three new Tensleep wells were forecast using hyperbolic decline curves, while the other reservoirs were predicted to follow an exponential decline. For the new Tensleep wells, the shape of the production forecast curves was based on the performance on the oldest of the three wells, 76-TPX-10, because the other two wells have been producing for too short a time to independently establish their decline parameters.

Estimated oil production from NPR-3 over the next twenty years totals 1.57 million barrels for all reservoirs. For the next ten years, this total is 1.26 million barrels. Only currently producing wells are included; therefore, these forecasts will yield estimates of Proved Developed Producing reserves. This is not considered to be a reserve estimate at this time since economic factors have not yet been incorporated. Economic considerations will be accounted for in our Phase II work, and would be expected to reduce these estimates. Total reserves estimated by Fluor Daniel as of June 30, 1995, were 1.55 million barrels of oil. That estimate also did not include consideration of economic factors.

1.7.1.3 Additional Reserves from Infill Drilling

The DOE has had an active infill drilling program at Teapot Dome over the last several years. Results of this program have been reviewed along with geologic data, in order to determine how much remaining undeveloped potential there may be at NPR-3.

Tensleep

The recent drilling program in the Tensleep at Teapot Dome has proved to be quite successful, although not without risk. Of the five Tensleep wells drilled since early 1995, three have come

in at high initial oil rates ranging from 160 to 789 BOPD and quickly paid out their drilling costs. The other two have been non-commercial, with only a show of oil from the 52-1-TPX-10 and 12 BOPD from the 46-X-10. (Figure 1.6 is a map showing Tensleep structure, productive area, and well locations.)

Of these, the 52-1-TPX-10 was determined to be in a separate nonproductive fault block. The 46-X-10 was a stepout location, and was structurally the highest Tensleep well drilled to date at Teapot Dome. It is not uncommon for Tensleep reservoirs in Wyoming to have a tilted water/oil contact due to a dynamic, steady state condition with continued aquifer flow under and past an oil accumulation. This may be the case at Teapot Dome. It has also been suggested by Mr. Jay LeBeau of Fluor Daniel that the high rates of water production from Well 46-X-10 are due to water channelling up from a deeper oil/water contact via an enhanced natural fracture system associated with flexure at the structural crest. Whatever the reason for the lack of productivity at 46-X-10, it essentially condemns any other potential infill locations in that area of the reservoir, from the point of view of attributing them any significant value. The DOE plans to test this section of the reservoir again at the end of September.

The DOE has planned two additional drilling locations in the Tensleep, the 72-X-10 and 75-X-10 as shown on Figure 1.6. In the opinion of this Consultant, the 72-X-10 could be credited with Probable reserves at this time, since it is downdip of the lowest commercially productive wells nearby. Further, this Consultant classifies a location in the general vicinity of the planned 75-X-10 as Proved Undeveloped. However, we would suggest locating the well further to the south and west (as shown on Figure 1.6) to minimize the possibility of encountering reservoir that has already been drained by production from Well 74-CMX-10-WD. We have just learned that Well 75-X-10 has recently been drilled and is awaiting completion. Classification of reserves in this area will be finalized in Phase II of this study as more data become available.

Additional infill locations have been identified and indicated on Figure 1.6. These include two more classified as Proved Undeveloped, two more classified as Probable, and three classified as Possible, for a total of nine remaining infill locations. Reserves for these locations are expected

Figure 1.6

to be variable; however, an average of the expected ultimate recoveries for the three most recent commercial wells, or about 80 MBO, is a reasonable estimate of reserves for the additional locations. Risk factors vary with the category of reserves. We estimate a chance of success of 80 percent for the Proved Undeveloped locations, 60 percent for the Probable, and 40 percent for the Possible. The DOE has proposed drilling seven additional Tensleep wells over the next five years, including three in FY 1996. Based on these assumptions, a forecast of annual production of the Tensleep Proved Undeveloped and Probable reserves will be prepared for use in Phase II of this project. The Possible reserves are considered to be too uncertain to justify preparation of a production forecast. They will be valued using alternate methods in Phase II.

Other Reservoirs

The success of infill drilling in other reservoirs at Teapot Dome has been more questionable. In Fluor Daniel's 1995 reserve report, reserves were estimated for each infill well drilled in the 1994 and 1995 drilling programs. These estimates have been reviewed and found to be reasonable. Results for infill drilling in the Shannon, Steele, and Niobrara are presented in the form of a frequency histogram in Figure 1.7. For the 58 wells included in this analysis, the average reserves are 5 MBO, while the mode, or most frequent reserves were in the category from 0 to 2,500 barrels, or 1,250 barrels on the average. The DOE's average cost to drill these wells is $69,400. This includes using a DOE-owned drilling rig. The cost for a private oil company to contract a drilling rig would be considerably higher. (Most oil Companies contract out drilling services; a prospective purchaser of the DOE assets at NPR-3 would be likely to sell off assets such as the drilling and workover rigs and contract out these services).

It is our opinion that a continued infill drilling program in the shallower reservoirs at Teapot Dome would be marginal for the DOE and uneconomic for an operator using contract drilling services. Despite the fact that the DOE has planned to drill several additional wells in these shallower reservoirs, this Consultant has assigned no Proved Undeveloped reserves to these wells. Possible reserves of 5 MBO per well are considered to be reasonable for this program, falling under the portion of the SPE reserve definitions covering reserves which are expected to be recoverable but may not be economic under current conditions.

FIGURE 1.7 NPR-3 '94-'95 Drilling Program Results - Excluding Tensleep

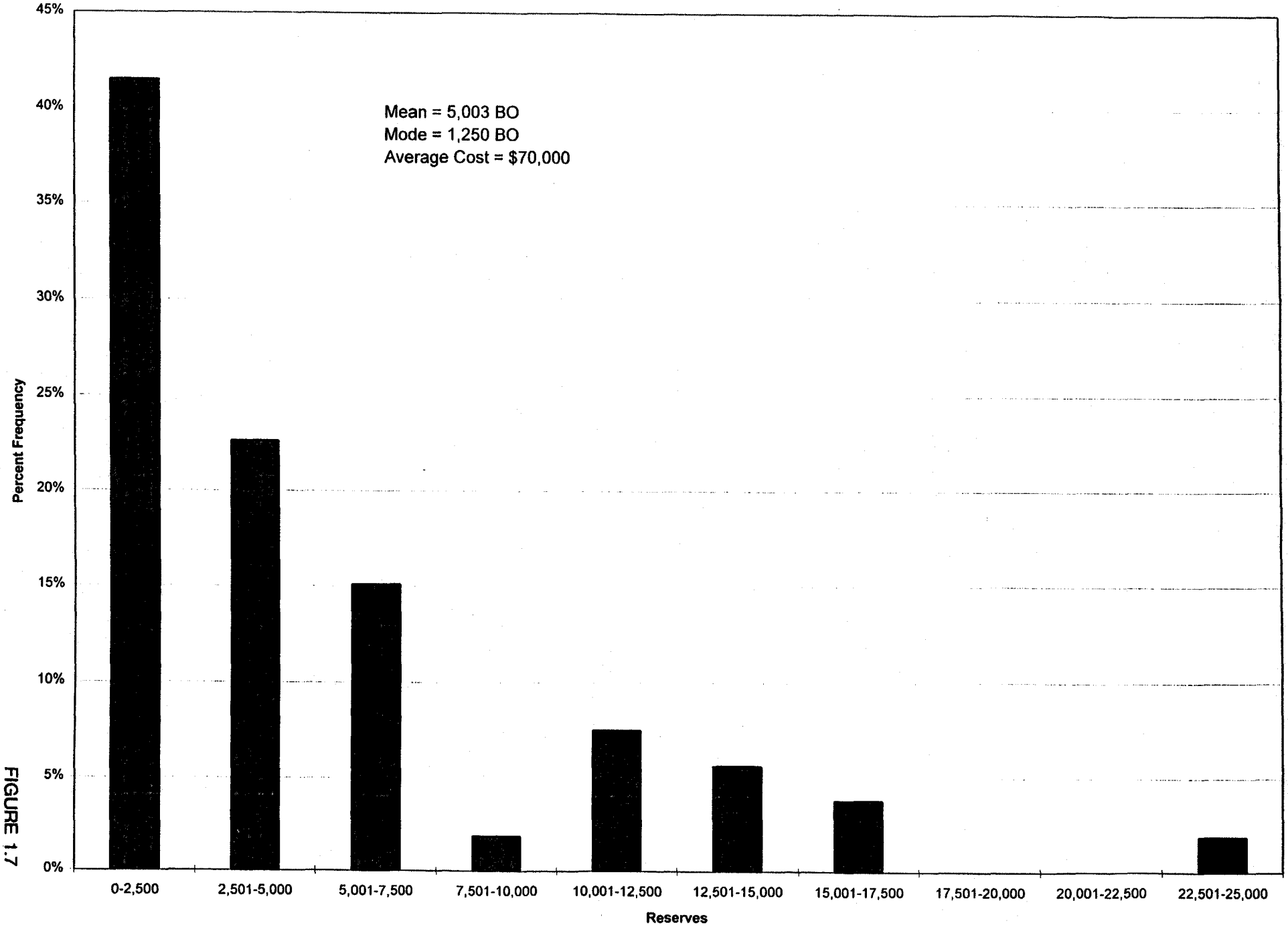


FIGURE 1.7

The economics of deepening a Shannon well to the Steele or Niobrara shale are expected to be somewhat better, but still marginal at best, for about the same average reserves of 5 MBO per well but a DOE cost of only $33,000. Again, this cost would be higher for a private operator contracting out drilling services. The DOE has planned to deepen several wells over the next five years, with four planned in FY 1996. Therefore, possible reserves will be considered in association with these deepenings. All these possible reserves will be valued as part of Phase II of this project.

1.7.1.4 Natural Gas Reserves

No natural gas is currently sold from Teapot Dome. Essentially all produced gas is reinjected into the Second Wall Creek. Gas injection was initiated into the Second Wall Creek as part of a pressure maintenance program. This program was abandoned in 1994; current gas injection is for the purpose of storing gas for later use as fuel for the Shannon steamflood project. However, initiation of gas sales by diverting gas from this reinjection program would undoubtedly affect oil production from the Second Wall Creek. Thus, no gas reserves can be assigned in the Proved Developed Producing category.

Gas reserves were estimated in the Fluor Daniel reserve report as follows:

Northern Second Wall Creek	1,874 MMCF
Southern Second Wall Creek	1,153 MMCF
Muddy	107 MMCF
Total	**3,134 MMCF**

An intra-DOE memo was provided discussing this gas reserve estimate. The memo indicated that Casper DOE personnel are of the opinion that the Southern Second Wall Creek "has a good chance of recovering most of the 1.1 BCF assigned to it." However, other reservoirs, including those listed above and the Shales and Shannon reservoirs, are expected by the DOE to be able to recover only up to 400 MMCF. As they state, "NPR-3 gas reserves are probably in the 1.0 to 1.5 BCF range."

Apparently no rigorous evaluation has been made of gas reserves at NPR-3 for some time. It is the opinion of this Consultant that such a rigorous evaluation would be inappropriate due to the speculative nature of future gas sales and the uncertainty as to whether such a venture would be economically feasible. Therefore, remaining gas reserves at NPR-3 are considered to be in the Proved undeveloped classification, and the DOE estimate of 1.5 BCF is judged to be reasonable and suitable for our further evaluation of this property. These reserves will be valued as part of Phase II of this project.

1.7.1.5 Natural Gas Liquids Reserves

As mentioned previously, the gas cycled through the Second Wall Creek reservoir is processed at the NPR-3 gas plant prior to use in the steamflood. Natural gas liquids production is currently at about 1200 gallons per day of propane and 4000 gallons per day of butane. Recent recovery has been 0.27 gallons/MCF of propane, and 0.86 gallons/MCF of butane (see Figure 1.8). A slowly declining trend has been projected, as shown on Figure 1.8.

Based on the current gas throughput of the gas plant, future natural gas liquids production has been estimated as shown in Table 1.3. This yields a total forecast production for the next ten years of 3,984,750 gallons of propane and 15,477,000 gallons of butane. This calculation assumes no additional gas throughput from the VA gas storage program nor any other source. Additional gas throughput from the Second Wall Creek reservoir associated with a gas storage project would be expected to increase liquids recovery.

1.7.2 Economic Factors

1.7.2.1 Economic Evaluation

The production forecast discussed above will be evaluated under the four scenarios described in the Introduction of this Report during Phase II of this project. In order to evaluate the cash flow associated with the future production stream, an economic model has been developed which

FIGURE 1.8

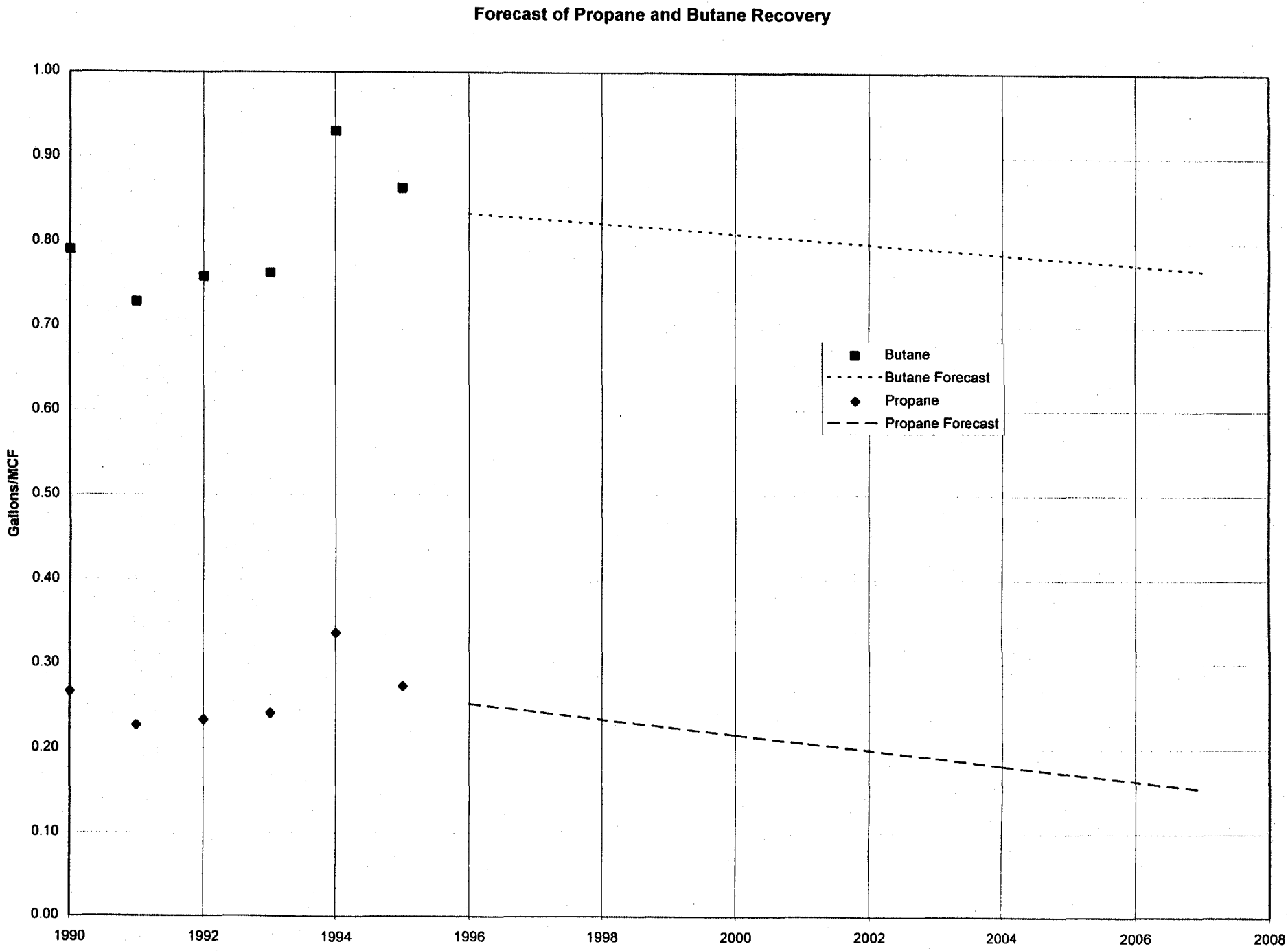

Forecast of Propane and Butane Recovery
Gallons/MCF
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Butane
Butane Forecast
Propane
Propane Forecast

Table 1.3

Propane and Butane Production Forecast

YEAR	PROPANE PRODUCTION (GAL/YEAR)	BUTANE PRODUCTION (GAL/YEAR)
1996	441,000	1,459,500
1997	425,250	1,449,000
1998	409,500	1,438,500
1999	393,750	1,428,000
2000	378,000	1,417,500
2001	362,250	1,407,000
2002	346,500	1,396,500
2003	330,750	1,386,000
2004	315,000	1,375,500
2005	299,250	1,365,000
2006	283,500	1,354,500
TOTAL	3,984,750	15,477,000

calculates an estimated cash flow stream to the U.S. government under various assumptions. This model is described in detail in Appendix D.

Phase II analysis will include review of appropriate oil prices and escalation, capital expenditures, operating costs. (discussed further below), and other economic factors.

1.7.2.2 Operating Costs

General Field Direct and Indirect Operating Costs

A preliminary review of operating expenses incurred by the DOE at Teapot Dome indicates that their costs are somewhat higher than would be expected for a typical oil and gas company operating a similar property. The costs, however, have shown a downward trend in recent years since DOE began implementation of their "right sizing" program for the field operations. These costs will be evaluated in more detail in Phase II of this project, and three cost scenarios will be considered:

1. Continued operation by the DOE with an M&O contractor such as Fluor Daniel,
2. Continued operation by the DOE acting without an M&O contractor, and
3. Operations by an independent oil and gas company.

Some adjustments to the oil production forecast may be required in conjunction with these scenarios. For example, timing of discontinuation of the Shannon steamflood may vary among these scenarios. Indirect operating costs are likely to be considerably lower for a private company than for the DOE.

Environmental Compliance and Staff Costs

In order to determine environmentally-related operating costs a "Sitewide Environmental Assessment" conducted by the DOE in 1995, a "Phase I Preliminary Assessment" for

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) compliance, and an "Environmental Safety, and Health Management Plan" for the NPOSRs provided information for the Phase I Fact Finding portion of this study. Additionally, correspondence with DOE Environmental Specialists and Engineers was instrumental in identifying operational requirements and estimated costs.

Included in operating costs are ongoing environmental costs associated with regulatory compliance programs and Environmental, Safety, & Health (ES&H) staffing requirements. Environmental programs categorized as operating costs are as follows:

1. Characterization, reporting, and disposal of hazardous and extremely hazardous waste for chemicals and non-exempt waste as required by the Resource Conservation and Recovery Act (RCRA) and the Superfund Amendment Reauthorization Act (SARA).

2. The "Major Source" status for air emissions at NPR-3 requires air quality monitoring and permitting under the Clean Air Act (CAA).

3. Water quality monitoring and permitting as it applies to National Pollution Discharge Elimination System (NPDES) permits and groundwater monitoring at the solid waste landfill according to Clean Water Act (CWA) guidelines.

4. Employee Safety and Health programs concerning walking and working surfaces, machine guarding, storage and handling of chemicals as required by the Occupational Safety and Health Act (OSHA). The estimated environmental operating costs are based on an annual average provided by the ES&H Management Plan Information System. These costs will apply to NPR-3 until the site is decommissioned.

The total estimated DOE annual environmental operating costs are $555,720. The total estimated Private Sector operating costs are $332,965. Operational requirements and management styles between the public and private sector are varied. With regard to compliance, DOE Orders require

a higher standard of compliance with more rigorous standards which can escalate operating costs. Should a transfer to the Department of Interior occur, current costs for the DOE will apply. Another cost differentiation between the two entities is that contract labor is common in the public sector, where a private company would tend to maintain compliance and safety with their own staff. The DOE has costs associated with twelve ES&H employees estimated at $395,288 annually. The current staffing also provides support for RMOTC. The required compliance tasks for the private sector can be accomplished with as few as four employees estimated at $199,683 annually. Environmental, Safety & Health staff requirements include personnel for Safety Monitoring, Environmental Management, Environmental Monitoring, and Administrative Support for the DOE and for the private sector.

If the DOE were to continue operating without Flour Daniel as a Contractor, it was confirmed by DOE staff that they would operate at the same level as a private operator with regard to staffing requirements. The DOE Orders would remain and compliance costs would be unchanged. Environmental compliance costs are detailed in Table 1.4. Table 1.5 details estimated environmental staffing costs. Environmental liability capital costs for NPR-3 are summarized in Section 1.12.

1.8 LEASEHOLD EQUIPMENT

The true value of most of the surface equipment associated with oil field operations is tied to the value of the oil production itself. For instance, the piping for flowlines from the wells to the production facilities have no real value alone but are intrinsically tied to the value of the oil production from that well.

With that philosophy, we have not attempted to value equipment that is required for primary oil production. Wellheads, flowlines, well testing facilities and production tanks were not valued. If operatorship is transferred, this equipment will be required to realize the primary value of the oil-producing property. Even with a field abandonment scenario, this particular equipment has no market value beyond a salvage value. The salvage value is assumed to compensate for field disassembly and reclamation and hence is a "wash" in value.

TABLE 1.4

ESTIMATED ENVIRONMENTAL, SAFETY & HEALTH COMPLIANCE COSTS

Item	Description	DOE Cost	Private Industry Cost
Occupational Safety & Health Act (OSHA)	Medical services, safety programs, fire protection, radiation protection, etc.	$88,000	$69,766
Clean Water Act (CWA)	Routine environmental monitoring: National Point Discharge Elimination System (NPDES), potable and groundwater testing; Bio-Treatment Facility	$28,833	$28,833
Resource Conservation and Recovery Act (RCRA)	Hazardous waste characterization and disposal; equipment maintenance; UST and soil testing	$17,350	$17,350
Environmental Safety & Health (ES&H) Equipment	Miscellaneous ES&H equipment/general supplies	$11,000	$11,000
Radiological Testing	Testing of Naturally Occurring Radioactive Materials at workover rigs	$3,083	- 0 -
Clean Air Act (CAA)	Air quality permits (Title v); payments of fees for emissions	$6,333	$6,333
National Environmental Policy Act (NEPA)	Noxious weed control	$5,833	- 0 -
Total Annual ES&H Compliance Costs		**$160,432**	**$133,282**

TABLE 1.5

ENVIRONMENTAL STAFF EXPENSES

Position	Description	DOE Cost	Private Industry Cost
Safety Specialist - Contractor	Provide guidance and oversite of the day-to-day activities at NPR-3	$60,833	- 0 -
Environmental Coordinator	Monitors waste stream management, spill prevention, clean-up and compliance	$54,933	$54,933
Environmental Specialist	Identifies and characterizes waste streams, responds to crude oil and chemical materials spills	$51,250	$51,250
Environmental Monitoring and Oversight	50% of one Federally Trained Employee (FTE) to monitor and oversee environmental activities	$49,666	-0-
Safety Monitoring and Oversight	50% of one FTE to monitor and oversee safety and health activities	$49,666	-0-
Environmental Manager	66% of one FTE to monitor, oversee and guide on-site contractor in environmental duties	$43,500	$43,500
Safety Monitoring ES&H Clerk		$21,000	-0-
Safety & Health (S&H) Manager	Provide oversight of Safety & Health (S&H) programs; Safety Officer; Quality Assurance Officer	$18,500	-0-
Environmental Safety & Health (ES&H) Secretary	50% of salary for an ES&H secretary to handle increased paperwork	$11,840	-0-
Environmental Manager 15% - Contractor	An Environmental Manager for the operating contractor at NPR-3.	$11,400	-0-
Safety & Health Manager - Contractor	15% of salary for S & H Manager for the Operating Contractor NPR-3	$11,400	$50,000
Environmental Technician III	Conducts ground and surface water sampling, air quality monitoring, and assists Environmental Coordinator	$11,300	-0-
Total Environmental Staff Costs		**$395,288**	**$199,683**

Well specific equipment such as pumping units and tubing is expected to have some salvage value which is used to offset the costs of plugging and abandoning the wells. This is discussed further in Section 1.11 of this Report.

1.9 PROSPECTS

1.9.1 Enhanced Recovery

Expansion proposals for the Shannon Steamflood have been evaluated. A mini-expansion (converting oil producing wells to steam injectors and using used equipment from some abandoned steamflood patterns) would keep capital requirements low but, economics of such an expansion at $20 per barrel oil price are marginal at best. Rate of return was calculated from DOE's projected cash flows for this project at less than 4 percent with an assumed oil price of $20 per barrel. No private operator would undertake such a project. Economics of larger, more capital-intensive expansions are expected to be even worse. Therefore, the Shannon steamflood project is not expected to have any upside potential.

Ideas have been suggested for various enhanced oil recovery (EOR) opportunities in the Second Wall Creek, such as a polymer-augmented waterflood, or an immiscible CO_2 flood as has been suggested for this reservoir at the nearby Salt Creek Field. However, none of these potential projects have been pursued sufficiently to add value to the Second Wall Creek.

The idea of waterflooding the Tensleep has also been mentioned, on the premise that the existing water drive may be only partial. Such a project would require a great deal more data gathering and planning before it would significantly affect the value of the Tensleep. Other reservoirs at Teapot Dome are not expected to have any EOR potential.

1.9.2 Exploratory

Pre-Tensleep sedimentary rocks range in age from Cambrian to Pennsylvanian and include the Amsden Formation (Pennsylvanian) and the Madison Limestone (Mississippian), both of which

are productive elsewhere in Wyoming, but not in the immediate area. Petroleum potential of these two zones (and other pre-Tensleep units) in NPR-3 is strictly speculative.

This Appraiser reviewed the Completion Report of exploratory well 1-G-10 which was drilled as a granite (basement) test in 1951 and 1952. This well was drilled on the crest of the Teapot Dome in NW/4 NE/4 SE/4 of Section 10-T38N, R78W to evaluate all potential reservoirs below the Second Wall Creek. Potential was established in the Muddy and Tensleep. Below the Tensleep, the following formations were penetrated:

- Amsden Formation at 5,538
- Madison Limestone at 5,800
- Cambrian at 6,045
- Granite at 6,849

All pre-Tensleep units were found to be either wet or impermeable, based on sample examination, cores, tests and logs. This is the only basement test this Appraiser is aware of. Any pre-Tensleep hydrocarbon potential is strictly speculative.

1.9.3 Gas Storage

DOE currently uses the Northern and Southern Second Wall Creek and the Muddy reservoir for gas storage for steamflood fuel. (Extra gas is purchased at lower summer prices for winter use.) There are sandstone structural traps containing oil with a gas cap. DOE estimates that there are 29 BCF in the Southern, 16 BCF in the Northern, and 3 BCF in the Muddy reservoir in the original gas cap that can be used to store gas. Additional gas volumes may be available from reservoir volumes that formerly contained oil. No physical testing has been done (for example, pressure buildup tests) to verify the volume available for storage.

Based upon experience for storing gas for their steamflood, DOE does not anticipate any capital expenditures to use up to 4 BCF of the reservoirs as a gas storage facility. For the past three

summers, DOE stored between one half and one BCF for their steamflood fuel. Seven wells are currently available to inject gas into the reservoirs. DOE used these wells to inject up to 8,000 MCF per day. DOE can produce and process up to 10,000 MCF per day. The steam flood requires approximately half of this processing capacity. The remainder could be available for the gas storage customer. Access to market is provided via a pipeline to Casper where there is a connection with the Kansas-Nebraska (KN) pipeline.

DOE expects to minimize operating costs during gas storage by shifting existing personnel into areas where extra help is needed. DOE plans to charge approximately $0.50 per MCF injected to cover compression, monitoring and accounting costs. This is comparable to industry gas storage charges, which typically include $0.25 per MCF when gas is put into storage, and $0.25 per MCF when it is removed.

The Department of Veteran Affairs (VA) is expected to store approximately three quarters of a BCF this summer in NPR-3, thereby generating $375,000 in revenue to DOE to offset operating expenses. Most of the revenue received for performing this service will be required to cover additional power and maintenance needs. Since no additional personnel or overhead costs are expected by NPR-3 staff, the remaining balance of the revenue will result in an uncosted balance. This uncosted balance can be expected to be carried over to the next year's budget -- with NPR-3's appropriations, reduced by an equal amount. As such, the only net additions expected are increases due to cover the additional power and maintenance needs.

The cycling of additional gas volumes through the Second Wall Creek reservoir would be expected to generate increased production of natural gas liquids at the plant and possibly increased oil production. However, this increased production is too speculative to be forecast at this time.

The value to VA of using gas storage is unclear. Actual storage value will be determined when VA uses the stored gas. The value is the savings obtained by comparing VA's cost of gas using the storage against the cost of gas at the point in time that VA uses the gas. VA's cost of gas

is a combination of the initial price, that is, the summer price, plus transportation (into and out of DOE facilities), storage costs, and time value of money. However, without rigorous analysis of the market prices for gas and transportation, estimating future gas prices would be based upon speculation. As a result, future savings is a difficult number to determine.

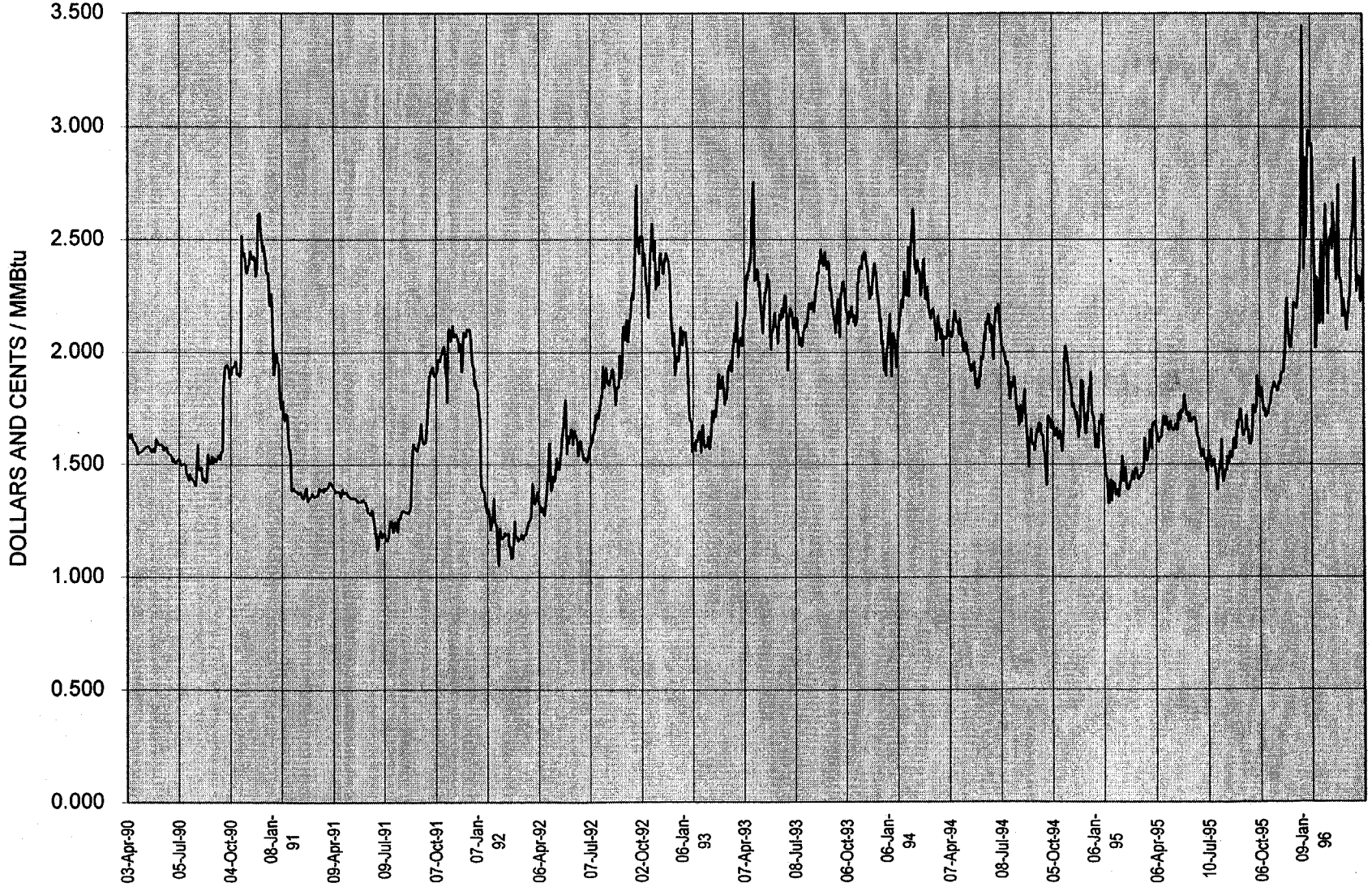
Some insight is available using current information. Operating costs for the storage are estimated to be $0.50 per MCF. Transportation will be higher for the gas stored at DOE's facilities. Based upon conversations with George Simmons of KN Pipelines and Bill Mitten of VA, estimates for the additional transportation range from an additional $0.10 to $0.30 per MCF. Thus, the summer-winter price spread must be as much as $0.80 per MCF in order for the VA to realize any financial benefit.

Unfortunately, a summer-winter price spread is unpredictable. As the attached graph shows (Figure 1.9), the price of gas in the past five years has not followed a consistent pattern. The prices shown here are the spot month settlement for a Million British Thermal Units (MMBTU) of gas on the New York Mercantile Exchange (NYMEX). Since these are prices for delivery at Henry Hub, Louisiana, there will be some variations due to transportation costs. Regional well head prices in the Rocky Mountains have tended to be lower due to higher transportation costs to get the gas to major markets; however, the trend has been the same. The graph shows a summer-winter price spread as great as $2.00 per MMBTU on a given two days. However, seasonal average is much closer, and between the summer of 1994 and the following winter, average prices actually dropped.

Although DOE has experience storing their own gas for use in the steamflood, they have not operated a commercial facility. They signed an agreement with the VA to provide up to 20 BCF storage capacity at NPR-3; however, VA has not committed to storing any gas as of the date of this Report. This agreement is not designed to provide additional value to NPR-3, but it may allow the VA to continue to minimize energy costs for the medical facilities they manage.

Figure 1.9

NYMEX NATURAL GAS - SPOT MONTH SETTLEMENT



1.10 ADDITIONAL SURFACE EQUIPMENT

Some of the surface equipment at NPR-3 has market value that could be realized relatively quickly if (1) operations are scaled back, and (2) only basic producing operations continue. The steamflood would be discontinued. Drilling and workover operations would be minimized and any required well work would be contracted. The maintenance work would be contracted also. This basic producing operation would allow the sale of the following equipment:

- Steam Generators
- Water Treating Facilities
- Drilling and Workover Units
- The Gas Processing Facilities
- Heavy Maintenance Equipment

Table 1.6 contains a list of all the equipment which we believe will have a market value beyond its value to continuing NPR-3 operations. This table summarizes the acquisition cost of the equipment, the year the equipment was acquired and our estimate of the market value of that equipment today. These estimates of market value were based on a field visit to assess the condition of the equipment, and a survey of the equipment market, as discussed in Section 2.3. Table 1.6 also includes an estimate for the disassembling, demolition and reclamation of this equipment. Disassembly includes all costs to prepare marketable equipment for sale. This does not include any transportation costs. Demolition and reclamation are costs to remove any auxiliary equipment associated with the marketable equipment and reclaim the area associated with the marketable equipment. We include these demolition and reclamation costs here, and we are burdening the market value of this equipment with these costs.

An additional group of equipment, the field electrical equipment, is necessary for continued field production. However, as opposed to other necessary items such as tank batteries and flow lines, this electrical equipment is expected to have a significant value after reclamation costs, as discussed below.

Table 1.6
SURFACE EQUIPMENT WITH MARKET VALUE

Description	Manufacturer	Cost New	Year New	Market Value	Demob Demolition	Net Market Value
Steam Generator #1	Struthers	$355,000	1987	$20,000	$12,400	$7,600
Steam Generator #2	CE Natco	$395,000	1988	$20,000	$12,400	$7,600
Steam Generator #3	Daniels ENFAB	$342,000	1990	$20,000	$12,400	$7,600
Steam Generator #4	Daniels ENFAB	$352,000	1991	$20,000	$12,400	$7,600
Steam Generator #5		$50,000	1991	$20,000	$12,400	$7,600
Water Treatment	Monarch				$65,000	$95,000
Tanks		$400,000	1992	$50,000		
Filtration/Softening		$700,000	1992	$100,000		
Instrumentation		$75,000	1992	$10,000		
W/O Rig P-6		$150,000	1970	$15,000	$0	$15,000
W/O Rig #2	Kremco	$300,000	1983	$30,000	$0	$30,000
W/O Rig #3	Kremco	$300,000	1984	$30,000	$0	$30,000
Drilling Rig #2 & #3		$1,000,000	1976/80	$50,000	$0	$50,000
Warehouse		$711,711		$70,000	$12,400	$57,600
Heavy Equipment						$0
Grader (2)	Champion	$200,000	1980/83	$20,000	$0	$20,000
Dozer w/Blade	Cat	$100,000	1979	$10,000	$0	$10,000
Vac Truck (2)	Kenworth	$180,000	1979/80	$18,000	$0	$18,000
Hot Oil Truck	International	$100,000	1980	$10,000	$0	$10,000
Ditcher	Ditchwitch	$85,000	1985	$5,000	$0	$5,000
Backhoe (2)	Deere	$110,000	1985/89	$25,000	$0	$25,000
Chemical Truck	GMC	$41,000	1989	$13,000	$0	$13,000
GMC Winch Truck	GMC		1972	$0	$0	$0
International Winch	International	$32,000	1982	$5,000	$0	$5,000
Champ Forklift	Champion	$44,000	1983	$2,000	$0	$2,000
Lincoln welder (3)	Lincoln		85/89/91	$15,000	$0	$15,000
Forklift	International	$14,776	1977	$2,000	$0	$2,000
Landfarm Tractor	Ford	$21,234	1994	$15,000	$0	$15,000
Electrical Equipment				$1,295,000	$341,310	$953,690
TOTALS		$6,058,721		$1,890,000	$480,710	$1,409,290

The total market value of the surface equipment after the associated demolition and reclamation costs is $1.4 million.

1.10.1 Steam Generators

Under the scenario of operatorship transfer and the "downsizing" to primary oil production operation at NPR-3, the steamflood project would be discontinued. There are five 50 MMBTU steam generators that may have some market value. Figure 1.10 is a photograph of one of these generators.

The nearest steamflood operations to Wyoming are the heavy oil fields in either California or Canada with the South American operations also being a possible market for these generators. A brief survey of operators in California reveals that the trend is toward the larger cogeneration units for their steam, but smaller units like these 50 MMBTU units are still common. The ancillary equipment such as the generator buildings, the insulated piping and instrumentation are not necessarily of use to other steam generator users and have not been considered in this market estimate.

Transportation is a big consideration when estimating the market value of these generators. These units can only be disassembled into several large sections and the weight of these sections is many tons each. Transportation costs may preclude the South American market for these particular units.

California market estimates for relatively new 50 MMBTU generators range from $25,000 to $50,000. With transportation costs being somewhat uncertain, we have estimated the older two units to have a value of $20,000 each. These values include an estimated transportation cost because the market location for these units is fairly certain.

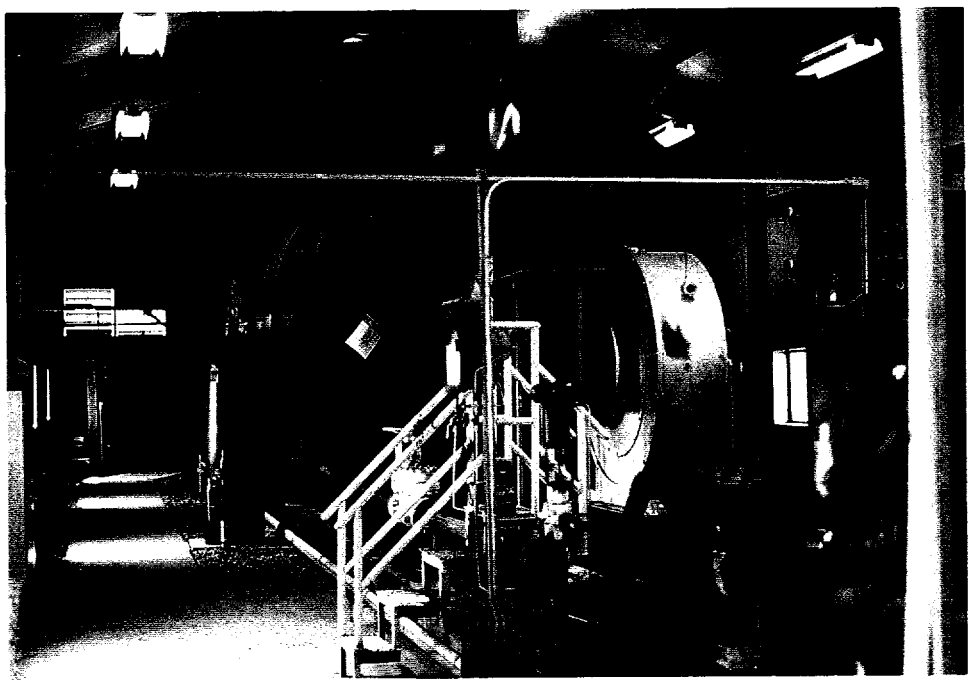


FIGURE 1.10- NPR-3 Steam Generator.

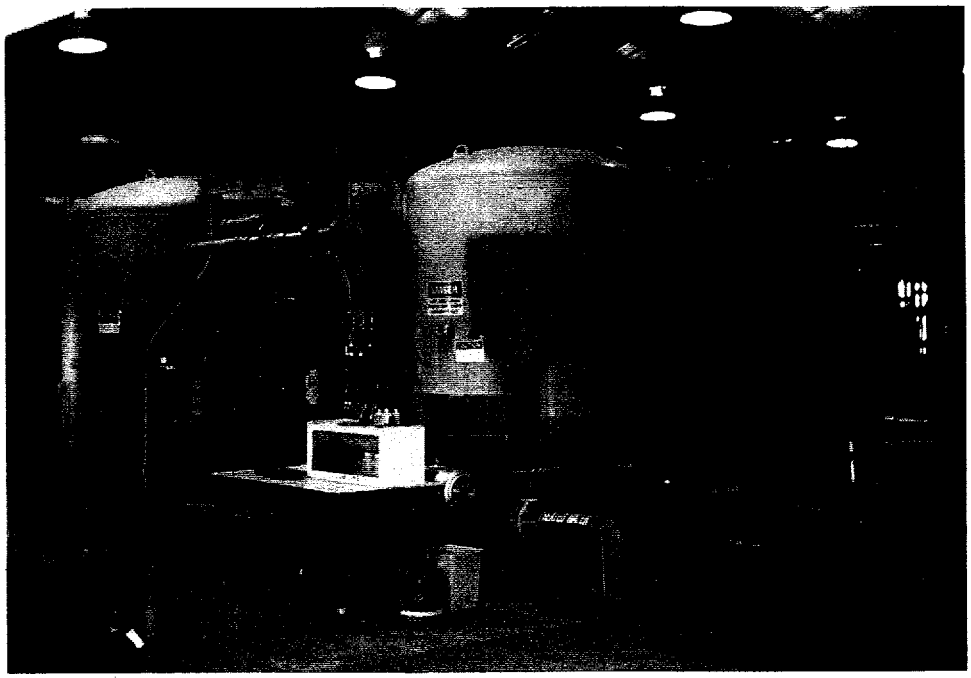


FIGURE 1.11- NPR-3 Water treatment facilities for steam generation, interior.

1.10.2 Water Treating Facilities

The water treating facilities that we are considering to have market value are the facilities that treat the water for the steam generators. Photographs of these facilities are shown as Figures 1.11 and 1.12. Other water treatment equipment used for treating produced water is considered necessary for primary oil production and is not seen as having additional market value.

Water treating equipment such as this has a broad range of applications outside the petroleum industry. This particular equipment produces very clean water that can be used in many different industrial applications. New water treating equipment comparable to this would cost $3,500 per gal/min in 1996. We have conservatively estimated that the water treating equipment at NPR-3 could realize $800 per gal/min, or a total of $160,000. No transportation costs are included in this estimate.

1.10.3 Drilling and Workover Units

DOE-owned equipment at NPR-3 includes two drilling rigs and three workover rigs (see photograph, Figure 1.13). Although this equipment is easily portable, the current market reflects a large supply of "stacked" drilling and workover units (a stacked rig is partially disassembled and stored due to low demand for its services). There may be some local interest in certain pieces of the rig such as the blow-out preventor. For the drilling and workover rigs the market value is estimated at 5 percent of acquisition cost or approximately $125,000 for all five rigs. No disassembly, demolition or remediation costs are expected.

1.10.4 The Gas Processing Facilities

The gas plant at NPR-3 has the capacity to process ten million cubic feet of gas per day, and is currently operating at five million cubic feet per day (see Figure 1.14 for a photograph of the plant). Two considerations are required when estimating the market value of the gas plant equipment: the market value of the entire processing facility as a unit, and the market value of

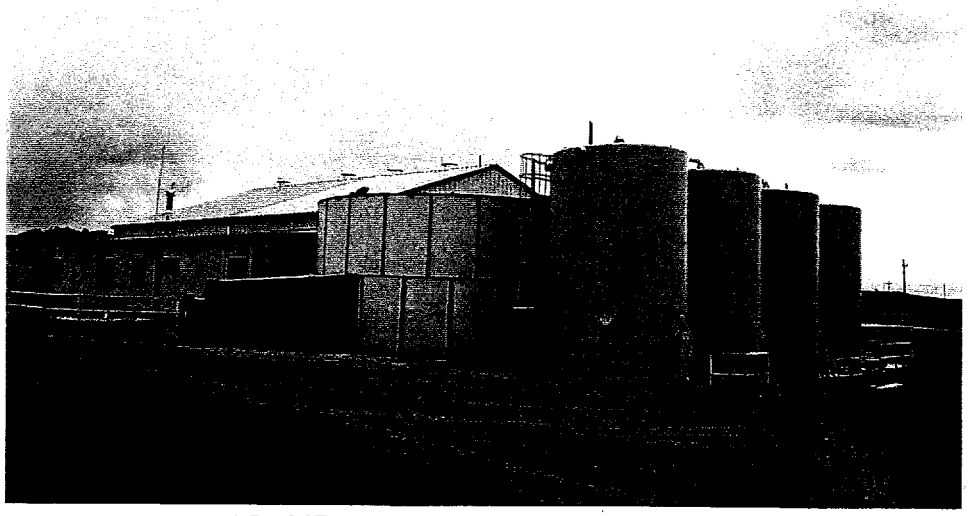


FIGURE 1.12-NPR-3 Water treatment facilities for steam generation, exterior.

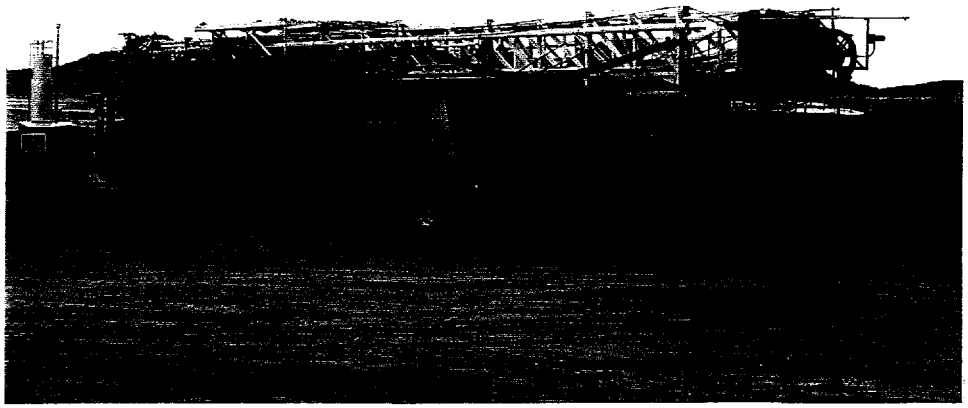


FIGURE 1.13-NPR-3 Workover Unit.

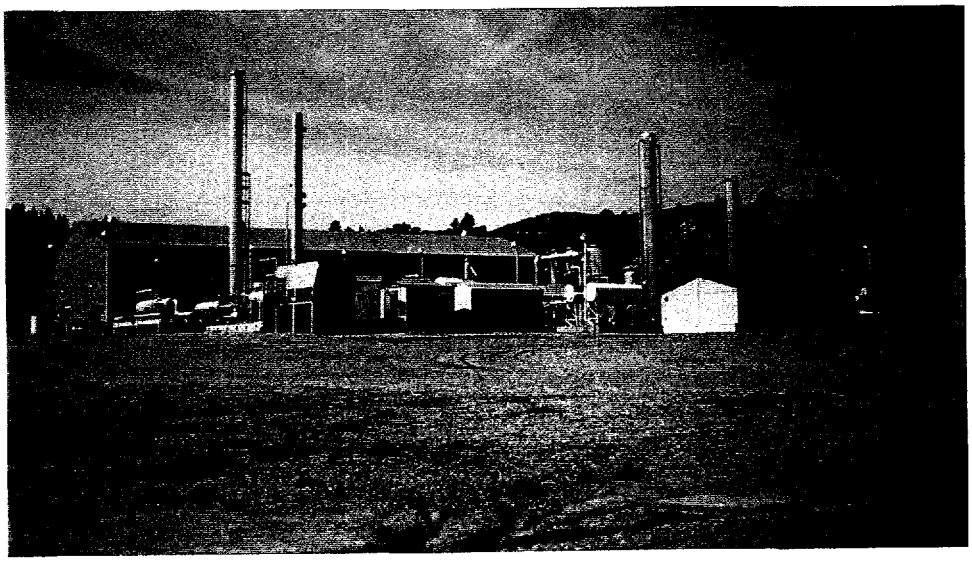


FIGURE 1.14-NPR-3 Gas Processing Plant.

the individual pieces of equipment. Several operators are attempting to sell entire plants. These operators are hoping for 5 to 10 percent of acquisition cost for plants that are 10 to 15 years old. In the case of the NPR-3 plant, that would yield a value range of $250,000 to $500,000. The operators have also invested 1 to 2 years in marketing these plants.

Equipment such as the compressors, the towers and the high-pressure storage tanks may bring more value if sold separately. The market value estimate for this type of equipment sold separately is $500,000.

The disassembly, demolition and reclamation of the gas plant are major considerations. The estimate for this is approximately $1,000,000. There are additional uncertain costs associated with marketing and transporting which could easily exceed another $200,000. Thus, the market value of the gas plant facilities is expected to be outweighed by the costs of realizing that value.

1.10.5 Heavy Maintenance Equipment

The heavy maintenance equipment should be relatively easy to monetize. Graders, dozers and trucks have a wide range of uses and are easy to transport. To estimate a market value for this equipment, this Consultant has used a wholesale pricing estimate based on 10 percent depreciation per year. The market value for all this equipment is estimated to be $140,000. Again, no demolition or transportation costs are associated with this equipment.

1.10.6 Electrical Equipment

Like the heavy maintenance equipment, the electrical equipment should be easy to monetize. This equipment includes 350+ transformers, wire, poles, and other minor electrical equipment. The electricians have itemized nearly all the electrical equipment in the field and have estimated that the net market value after the cost of "disassembly" is approximately $950,000. This value can be realized only at the time of field abandonment.

1.11 PLUGGING AND ABANDONMENT LIABILITIES

1.11.1 Summary

The largest single liability facing the NPR-3 operation is the number of wells that will ultimately require plugging and abandonment (P&A). The latest information (Table 1.7) indicates that there are 1170 wells in the field that will require P&A.

The total P&A liability is estimated to be $4.2 MM. Tables 1.8 and 1.9 summarize this liability estimate. The cost to P&A all 1170 wells is summarized in Table 1.8. This table includes an estimation of salvageable well equipment such as tubing. Table 1.9 summarizes the salvage value estimate of the 666 pumping units and credits this salvage against the P&A cost from Table 1.8 to arrive at a P&A liability of $4.2 MM. This is a substantial liability that ultimately may rest with the DOE. This is an estimate of the entire liability that will be required to abandon the field.

Recently Conoco had to post a surety bond for $296,838 for plugging 31 wells in Wyoming as part of their property transfer to Westport Oil. Wyoming Oil and Gas Conservation Commission rule 304 states that a bonding of $2.00 per foot of dormant wells in excess of 12,500 total feet may be required. The responsibility of this bond may rest with either the buyer or the seller, depending on the financial condition of the two parties. This bond is returned once the P&A requirements associated with the bond are fulfilled. Under the scenario of a small private entity purchasing NPR-3, these same requirements could be the responsibility of the DOE, and the bond amount could exceed $600,000.

1.11.2 Wyoming Requirements for Plugging and Abandonment

The Wyoming Oil and Gas Conservation Commission has a set of requirements for plugging wells which basically protect all water, oil and gas bearing formations. These requirements are summarized as follows:

TABLE 1.7

WELL STATUS SUMMARY - NPR-3

	Shannon	Steel Shale	Niobrara Shale	2nd Wall Creek	1st/3rd Wall Creek	Muddy Mowry	Dakota	Lakota	Morrison	Tensleep	Crow Mtn Potable x Madison	TOTAL
Temporarily Abandoned	1	1	0	6	0	1	1	0	0	0	0	10
	1	1	0	6	0	1	1	0	0	0	0	10
Producers	414	40	35	69	4	5	2	0	0	8	0	577
Intermittent PR-SI Cycle	16	15	12	8	1	0	1	0	0	0	0	53
Gas Injectors	0	0	0	3	0	0	0	0	0	0	0	3
Water Injectors	10	0	0	0	0	0	0	0	0	0	0	10
Steam Injectors	29	0	0	0	0	0	0	0	0	0	0	29
Observors	1	0	0	0	0	0	0	0	0	0	0	1
Water Source	0	0	0	0	0	0	0	0	0	0	0	2
Water Disposal	0	0	0	0	0	0	0	0	0	0	2	3
Operating Wells	470	55	47	80	5	5	3	0	0	0	3	678
Shut-In	157	27	10	92	4	6	1	3	1	3	4	308
Dormant	82	10	3	53	1	1	0	1	0	2	10	163
Plugged & Abandoned	23	7	22	42	3	6	1	1	7	4	43	159
Non Producing Wells	262	44	35	187	8	13	2	5	8	9	57	630
Awaiting Completion	4	1	0	0	0	0	0	0	0	0	6	11
Drilling/Completion Wells	4	1	0	0	0	0	0	0	0	0	6	11
GRAND TOTAL	**737**	**101**	**82**	**273**	**13**	**18**	**6**	**6**	**8**	**17**	**68**	**1,329**

Table 1.8

PLUG & ABANDONMENT COST ESTIMATES

PRODUCING ZONE	PBTD	PRODUCING INTERVAL	RIG COST TO PULL TUBING	PLUGGING COST PER WELL	RECLAIM COST PER WELL	NUMBER OF WELLS (as of 6/5/96)	P&A COST FOR ALL WELLS IN THIS ZONE	SALVAGE FOR TUBING
Shannon	750	620-700'	$500	$2,802	$1,000	714	$3,071,628	$174,038
Steele Shale	2,700	1200-2700'	$625	$5,272	$1,000	94	$648,318	$91,650
Niobrara Shale	2,500	900-2500'	$625	$5,555	$1,000	60	$430,800	$54,000
Second Wall Creek	3,200	3100-3150'	$750	$3,702	$1,000	231	$1,259,412	$268,538
Muddy Sand	4,200	4092-4100'	$750	$4,240	$1,000	33	$197,670	$50,738
Tensleep	5,600	5500-5520'	$750	$7,186	$1,000	38	$339,568	$78,375
TOTALS						1,170	$5,947,396	$717,338

TOTAL P&A COST $5,230,059

ASSUMPTIONS
Workover rig cost $125/hr (to pull tubing and prep well)
All wells plugged without using rig except Tensleep wells
Reclamation cost includes grading location and road and reseeding ($700 for location $300 for road)
Assume tubing is 100' off bottom and 75% salvage rate
Tubing salvage=tubing length x $.50/ft (redband tubing)

Table 1.9
PUMPING UNIT SALVAGE SUMMARY

UNIT SIZE	NUMBER	AVG COST NEW	TOTAL COST NEW	MANUFACTURER	MARKET VALUE per UNIT	TOTAL VALUE
10-30-3	60	$1,200	$72,000	LUFKIN	$750	$45,000
16-53-30	50	$1,700	$85,000	LUFKIN	$1,000	$50,000
25-53-30	290	$2,900	$841,000	JENSEN	$800	$232,000
57--89-42	135	$6,000	$810,000	AMERICAN	$1,500	$202,500
114-143-64	56	$12,000	$672,000	AMERICAN	$2,500	$140,000
228-173-86	75	$15,000	$1,125,000	NATIONAL	$5,000	$375,000
TOTALS	666		$3,605,000			$1,044,500

TOTAL P&A COST $5,230,059

TOTAL P&A LIABILITY $4,185,559 (with Pumping Unit Salvage)

A minimum cement plug length of 100' must be set over the following:

- all open hole formations
- every 2500' feet if no other reasons justify a plug
- the stub of the casing
- the base of the surface casing

In addition:

- two sacks of cement are required on top of bridge plugs
- open perforations must be squeezed
- horizontal wells must have at least 100' of the lateral and 100' of the vertical section full of cement

1.11.3 Valuation Methodology

We did not estimate P&A costs for each individual well in the field. P&A expenses were estimated for typical wells completed in different producing zones. Those costs were multiplied by the total number of those types of wells in the field. The following items are included in the P&A expenses:

- Inspection Cost
- Rig Cost
- Cement Cost
- Mud Cost
- Reclamation Cost

All of these costs have been summarized in Table 1.8.

1.11.4 Plugging Costs

To obtain the actual plugging costs, this consultant obtained cost estimates from two small service companies that work in this part of Wyoming and have had their P&A work approved by the state of Wyoming. These two companies considered the total number of each type of well so that volume discounts could be incorporated into their estimates.

1.11.5 BLM Requirements for Abandonment

In addition to plugging costs, the well locations must be reclaimed and remediated. On federal land the BLM has established requirements for returning the well locations to original condition. Mr. Bob Anderson, a former BLM employee, informed us that this is a requirement for all wells drilled since 1978. All but 155 of the 1170 wells have been drilled since then, so we assumed that all well locations and roads to the wells must be returned to "pristine condition". Although some DOE personnel have indicated that such reclamation would be voluntary rather than required within the NPRs, it is our opinion that the DOE would abide by the BLM standards for reclamation even if not legally required to do so. Those cost estimates are included in Table 1.8.

1.11.6 Salvage

In addition to these P&A costs are salvage value estimates for tubing and pumping units. Some "redband" tubing was recently sold for approximately $18 per joint (approximately $0.50 per foot). Assuming 75 percent tubing recovery at $0.50 per foot, we have calculated a salvage for tubing in Table 1.9. The market is also paying $750-$5000 per pumping unit, depending primarily on the size and age of the unit. That salvage value has been credited directly against the P&A cost to arrive at a total P&A liability as shown in Table 1.9.

Salvage for wellheads and flowlines is not included, because the salvage value will only pay for the field reclamation of that equipment.

1.11.7 Timing

Under the rules of the Wyoming Oil & Gas Conservation Commission, a well may not be maintained as shut-in (SI), temporarily abandoned (TA) or dormant for more than 24 months without an approved extension. A prudent operator of a field such as NPR-3 would implement a fairly aggressive P&A schedule to prevent incurring a large abandonment cost in the last year or two of operation. With previous ownership transfers, extensions have not been so readily approved until the appropriate bond (see Section 1.11.1) is posted to cover P&A liabilities. As part of this evaluation, the P&A schedule for evaluation purposes will be prudently aggressive. There is presently a P&A plan compiled by Fluor Daniel to P&A 50 wells by October 1996, 100 wells in 1997, 100 wells in 1998 and 100 wells in 1999. Beyond that, the wells are assumed to be P&A'd according to a schedule that will follow a similar P&A quantity per year that will arrive at all wells being P&A'd during the last year of field life. This schedule will probably be refined during Phase II.

A weighted-average cost to P&A all the wells in the field was utilized to arrive at an annual P&A cost schedule to incorporate in our valuation. This is a preliminary schedule which will be refined based on field economics during Phase II of this study. That schedule is shown in Table 1.10.

TABLE 1.10

PLUGGING AND ABANDONMENT SCHEDULE

YEAR	WELLS P&A'd	TOTAL P&A COST
1996	50	178,870
1997	100	357,740
1998	100	357,740
1999	100	357,740
2000	100	357,740
2001	150	536,610
2002	150	536,610
2003	150	536,610
2004	150	536,610
2005	120	429,288
TOTALS	1,170	4,185,559

Contacts made as part of the effort to access plugging and abandonment liability are summarized in Table 1.11.

TABLE 1.11

List of Sources for Plugging and Abandonment Evaluation

1. John Kerns, Rocky Mountain Cementers; Gillette, WY; (307) 682-9291.
2. Frank Hutto, H&S Well Services; (970) 432-5285.
3. George Grame, C&G Equipment.
4. Doug Strangfeld, Sunward, Louviers, CO (303) 791-9790.
5. Carol Baker, City of Colorado Spgs; (719) 488-1549.
6. Bob Anderson, (ex BLM) Heitzman Well Services, Casper WY; (307) 473-1268.
7. Mel Grimes, Grimes Sales & Services, Lampman Sask; (306) 487-2525.

1.12 ENVIRONMENTAL LIABILITIES

1.12.1 Introduction

In order to provide an accurate estimate of the value of and liabilities against the petroleum reserve at NPR-3, this Consultant contacted the DOE Environmental Specialist and Engineers to determine the nature and type of environmental remediation costs, including plugging and abandonment costs (reference Section 1.11), in accordance with all applicable Federal, State and local laws. Liabilities and capital costs for environmental remediation, mitigation and for decommissioning NPR-3 are identified in this portion of the study.

The National Environmental Policy Act (NEPA) required that a Sitewide Environmental Assessment (EA) be prepared in July, 1995 for the proposed continued development of Teapot Dome. The NPR-3 EA provided a baseline of current site conditions and potential and current environmental liabilities. The EA was concluded with the classification of "Finding of No Significant Impact" for current and future development on NPR-3. Therefore, an Environmental Impact Statement was not required for the continued development of NPR-3. However, a new EA will be required for the sale or leasing of NPR-3.

Under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), a Phase I Preliminary Assessment was conducted in 1990 to identify and evaluate hazardous waste disposal sites on NPR-3 including drilling operation mud pits and buried herbicide containers. The Environmental Assessment, Preliminary Assessment, and the Environmental, Safety, and Health (ES&H) Management Plan for NPOSRs provided the necessary information for the Fact-Finding phase of the NPR-3 valuation study. It is this Consultant's opinion that the DOE reports described above provided the documentation necessary to assess the environmental liabilities for NPR-3.

David Miles, DOE Environmental Manager for NPOSR sites, provided the Management Plan documentation and correspondence necessary to estimate costs associated with environmental staff

requirements, Federal regulatory compliance, and clean-up efforts for current and future environmental activity at NPR-3.

1.12.2 Summary of Environmental Issues

From 1915 to the present, 1623 acres at NPR-3 have been disturbed by oilfield operations. Over half of the disturbed areas have been reclaimed (revegetated). The area that has not been reclaimed and continues to be developed includes approximately 784 acres. This area requires environmental regulation compliance, mitigation, remediation, and decommissioning.

The following items are considered to be the major items which will require environmental remediation at NPR-3.

1. Decontamination and decommissioning of eight oil battery sites and removal, which is expected to take place on an annual basis as tank batteries are abandoned (Figures 1.15 and 1.16).

2. Remediation of ten buried herbicide barrels according to compliance with CERCLA;

3. Netting operational and removing unused water disposal ponds is necessary to prevent migratory birds from landing in ponds and is required by the Migratory Bird Act. Netting and removal of ponds is a recurring cost over several years prior to closure of NPR-3 (Figure 1.17 and 1.18).

4. Decommissioning production facilities at field abandonment such as the landfill, underground storage tanks, infrastructure demolition, electrical system removal, and hazardous waste disposal (Figure 1.19).

NPR-3 INFRASTRUCTURE DEMOLITION LIABILITY

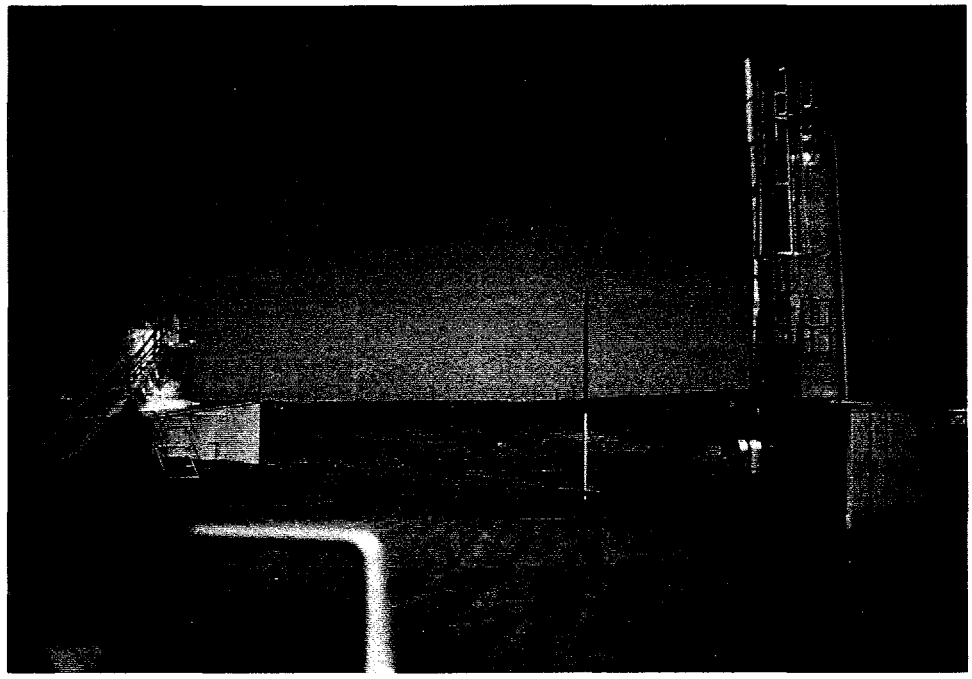


FIGURE 1.15-NPR-3 Tank & 3-phase separator.

FIGURE 1.16-NPR-3 Tank battery.

NPR-3 ENVIRIONMENTAL MITIGATION, REMEDIATION, & RECLAMATION LIABILITY

FIGURE 1.17- NPR-3 Waste water disposal pit.

FIGURE 1.18- NPR-3 Netted disposal pond.

FIGURE 1.19-NPR-3 Wildlife (pronghorned antelope).

Total estimated environmental capital costs for the DOE are $3.15 million, as detailed in Table 1.12. The capital cost estimates are based on DOE costs for environmental regulation compliance, remediation, mitigation, demolition and reclamation. Based on our review of these cost estimates, it is our opinion that they are reasonable.

Further, it is the opinion of this Consultant that generally, a private operator could not perform the required remediation and decommissioning work at NPR-3 at a significant cost savings over the DOE estimated costs. However, with regard to the buried herbicide barrels, it is likely that a private operator would simply cap the affected area at an estimated cost of $20,000 at the time of decommissioning NPR-3, as contrasted with the DOE's plan to remove and reclaim the contaminated area in question at a cost of $500,000. It should be noted that the DOE has budgeted $500,000 for cleanup, although the extent of contamination will determine requirements for compliance. Capping at a cost of $20,000, may be all that is required. If that is the case, the DOE cost will be the equivalent of industry capital expenses. Thus, total estimated environmental capital costs for the Private Sector are $2,674,054 (Table 1.12).

1.13 SPECIAL ASSETS/LIABILITIES -- ROCKY MOUNTAIN OILFIELD TESTING CENTER (RMOTC)

As part of the NPR-3 study, visits were made to RMOTC. RMOTC personnel have been interviewed, substantial amounts of material have been received, and a large number of interviews with oil companies and equipment manufacturers testing at RMOTC have been contacted. Also, trainees and interns who have received oilfield training at RMOTC have been interviewed.

The findings from this work have revealed a substantial amount of activities and expenditures; however, at the date of this writing, differing opinions are being presented by RMOTC personnel and by various parts of industry. In some cases there is agreement between the parties with regard to success or failure of a particular activity; in other cases there are strong differences in opinion. Consequently, since most of the findings to date are based on interviews, additional fact finding is necessary prior to our committing this material as facts in a report form.

TABLE 1.12

ENVIRONMENTAL CAPITAL EXPENSES

Item	Description	DOE Cost	Private Industry Cost
Abandoned Oil Battery Sites	Decontamination and decommissioning activities on eight tank batteries (Figure 1.16)	$675,000	$675,000
Herbicide Barrels Removal	Remove ten buried barrels of pesticides; remediate and reclaim contaminated area	$500,000	$20,000
Pond Netting and Removal	Migratory Bird Act requirements to net ponds and remove ponds that are not needed ($75,000/year for 1977-2002) (Figure 1.18)	$450,000	$450,000
FIELD DECOMMISSIONING AND RECLAMATION			
NEPA Compliance	An environmental assessment will be required by NEPA for field decommissioning	$82,662	$82,662
Battery Demolition and Remediation at Abandonment		$387,581	$387,581
Pit Closure	Soil remediation and reclamation for 18 NPDES permitted pits, 25 slowdown pits and 26 boxes (Figure 1.17)	$818,642	$818,642
South Terminal Demolition		$58,400	$58,400
Concrete and Foundation Removal		$46,200	$46,200
Hazardous Waste Disposal		$23,178	$23,178
Office/Shop Demolition		$24,600	$24,600
North Waterflood Demolition		$18,400	$18,400
Landfill Closure		$14,594	$14,594
Polymer Building Demolition		$14,400	$14,400
Welding Shop Demolition		$12,400	$12,400
Warehouse Demolition		$12,400	$12,400
Records Disposition		$6,759	$6,759
Sludge Disposal		$4,345	$4,345
Landfarm Closure		$2,384	$2,384
Underground Storage Tank Removal		$2,109	$2,109
Total Capital Costs		**$3,154,054**	**$2,674,054**

Therefore, instead of including the material in this particular volume we have prepared a separate report and only in draft form. This way, we are indicating that our findings are very preliminary, that additional fact finding is necessary, and that the various parties involved need to be contacted with regard to the widely varying statements of results from the work. Only through this process can this Appraiser reach a point of factual information on the basis of which the value, positive or negative, of RMOTC to the U.S. Government can be estimated.

1.14 EFFECT OF TAXES

Taxes, levied by federal, state and local authorities, reduce the income to the property owner. The effect of taxes on the value of the federal government's interest in NPR-3 can be shown by comparing Case 1 (the current situation) to the other three cases.

1.14.1 Federal Income Taxes

The private ownership of mineral interests are taxable to the extent that taxable income is generated from the sale of those minerals. As for Case 1, NPR-3 currently generates income that is not taxable: all revenue goes to the Treasury Department. Transfer within the federal government (Case 2) would not be expected to change the flow of revenue to the Treasury Department. Case 3, that is DOI leasing of the properties, transfers a portion of the mineral ownership to the individuals and companies that will continue to produce oil and gas from NPR-3. Taxable income may be generated by the leases. Likewise, the transfer of fee interest in the properties through outright sale (Case 4) is expected to produce taxable income.

Federal Income tax liability will impact the value of the mineral interest in NPR-3 that is transferred to private individuals or companies. Correspondingly, a federal income tax stream would be generated, contributing to the future cash flow to the federal government. Estimating the new owner's tax liability is a rigorous process based upon ever changing IRS regulations. There are tax differences, such as tax rates, between individuals and corporations. Similarly, there are tax differences due to variations between corporations. During Phase II of this project,

we will explore the impacts of federal income taxes by evaluating sensitivity to various reasonable assumptions.

1.14.2 Wyoming Income Taxes

Wyoming does not have a state income tax. The transfer of ownership of the properties in Cases 2, 3, or 4 will not change the state tax liability from Case 1. State income taxes do not impact the value of NPR-3.

1.14.3 Ad Valorem Taxes

Local taxing authorities levy taxes against property owners when the property is located within the authority's taxing district. Based upon the value of the NPR-3 properties, as determined by the county tax assessor, the new owner would be liable for ad valorem taxes. These taxes are estimated to be 7.5 percent of the previous year's wellhead revenue; that is, revenue after transportation charges but before operating expenses. A knowledgeable potential purchaser would be expected to consider the effects of such taxes when considering a purchase price of the property. Thus, these taxes will affect our estimation of Fair Market Value in Phase II.

1.14.4 Severance Taxes

In lieu of a state income tax, Wyoming levies taxes based upon the wellhead value of produced oil and gas. Like ad valorem taxes, severance taxes are independent of the profitability of the owner. The new owner would be liable for severance taxes for their portion of the production. Severance taxes are estimated to be 5 percent of the current year's well head revenue. As stated above, a knowledgeable potential purchaser would be expected to consider the effects of such taxes when considering a purchase price of the property. Thus, these taxes will affect our estimation of Fair Market Value in Phase II.

2. MARKET

2.1 CURRENT LEASING ACTIVITIES

2.1.1 Methodology

Market data were obtained from the Cheyenne office of the Bureau of Land Management for recent competitive oil and gas lease sales on federal lands in eastern Wyoming. Research was also conducted in certain county courthouses in eastern Wyoming in order to obtain information on lease transactions for fee lands. Information on state lease sales was also obtained as part of this market assessment. This lease information was obtained for use in valuing certain undeveloped portions of NPR-3.

2.1.2 Area of Investigation

Research for the leasing activity described above was conducted in Natrona, Johnson, Campbell and Converse Counties, Wyoming. Oil and gas activity in these counties is considered comparable to the conditions present on NPR-3. Incorporating these areas of the Powder River basin as part of the study area allowed for a good statistical sampling of market data.

2.1.3 Assessment of Current Lease Rates for Undeveloped Properties

The results of Wyoming federal and state leasehold transactions are presented in Appendices E and F, and shown on Plate 1. Information on fee leases was only recently obtained and is in the process of being tabulated. Lease transactions on federal lands report all pertinent information regarding the transaction including bonus amount, royalty rate, rental and term. Fee lease transactions typically only report royalty rate and term on the lease document. Acreage rentals and bonus amounts usually are not reported and must be obtained from the parties involved.

Leasing activity in the area of investigation was moderately active over the past three years. A considerable amount of acreage was leased in the vicinity of NPR-3. A map showing the location of these transactions is currently being prepared and will be submitted under separate cover. For the federal lease transactions, bonus amounts range from a low of $2.00 per acre to a high of $80 per acre. Bonus amounts for state leases ranged from $1.00 to $107 per acre (Figure 2.1). Bonus amounts in the $2.00 per acre range were for those lands that were undeveloped and/or located some distance from production. The data is presented statistically on Table 2.1. Higher bonus amounts are paid for those lands closer to production and/or considered prospective by the oil and gas operator.

Based on the market data obtained, royalty rates for federal acreage is always 1/8 or 12.5 percent while the State of Wyoming receives 1/6 or 16.7 percent royalty (Figure 2.2). Acreage rentals do not vary much: the lessor typically receives one to two dollars per acre over the term of the lease.

The lease term for federal and state acreage is ten and five years respectively. On fee leases, the lease term is typically three to five years with options to renew for an additional two years.

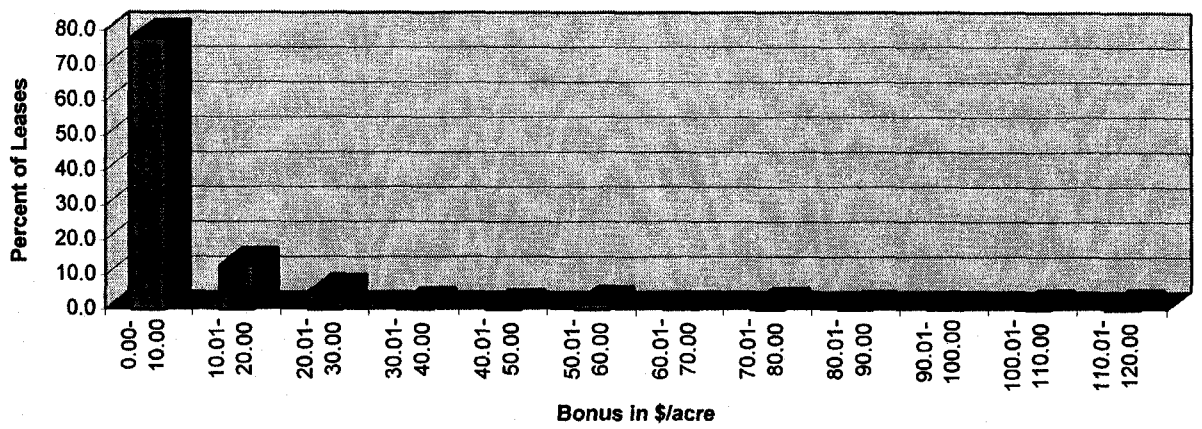
2.2 RECENT MINERAL SALES

2.2.1 Methodology

An assessment of the current market was conducted in order to find transactions of mineral properties recently sold in the area of study. Market data were gathered for producing oilfields since the NPR-3 is a mature oilfield with established historical production in various zones.

Research was conducted at the Wyoming Oil and Gas Commission in order to identify recent operator transfers of producing properties in the Powder River Basin. These transfers often indicate a sale and the legal instruments associated with this transaction were then obtained from the county courthouse records.

A



B

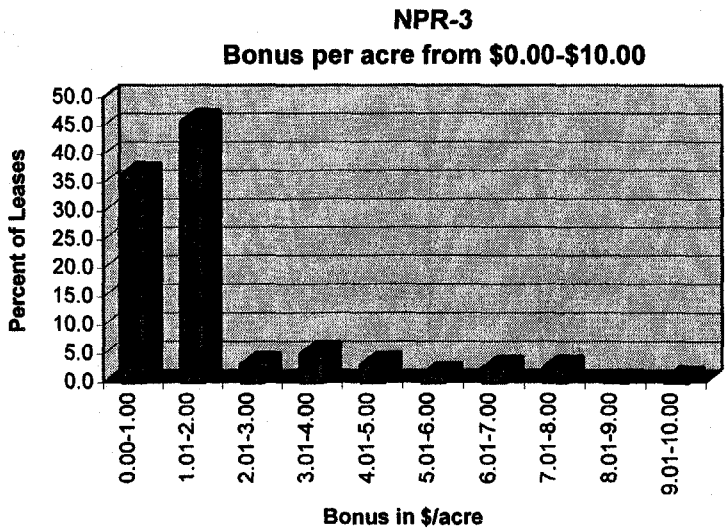


Figure 2.1 A:Federal and State bonus bids.

Figure 2.1 B: Breakdown of the bonuses paid between $0.00 and $10.00.

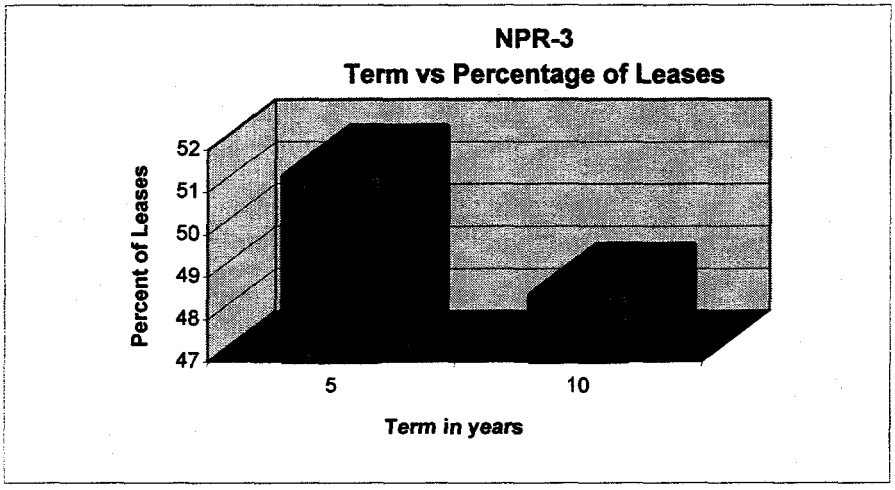


Figure 2.2: Federal and State oil and gas lease terms.

Table 2.1
Statistical data for state and federal oil and gas leases

		Bonus $/acre	Term years
Federal	**Mean**	$7.26	10
	Median	$2.00	10
	Mode	$2.00	10
State	**Mean**	$8.79	5
	Median	$1.00	5
	Mode	$1.00	5
Total	**Mean**	$8.05	7.4
	Median	$2.00	5
	Mode	$2.00	5

Assessment of the current market can also be performed using mineral conveyances in the area. In this regard, this Consultant searched and obtained information on mineral deeds and conveyances that were recorded in the county courthouse.

2.2.2 Area of Investigation

Research for the transactions described above was conducted in Converse, Campbell, Johnson and Natrona Counties, Wyoming. Oil and gas activity in these counties is considered comparable to the conditions present on NPR-3. Incorporating these areas of the Powder River Basin allowed for a good statistical sampling of market data as part of the study area.

2.2.3 Assessment of Current Market

2.2.3.1 Producing Oil and Gas Properties

A courthouse search was conducted to obtain mineral deed and royalty sales, assignments and/or transfer data for the region surrounding NPR-3 in Natrona County, Wyoming. This search included lands surrounding NPR-3 for a radius of approximately 30 miles. Over 125 records of such sales, transfers and assignments were recovered for a two-year period dating back to mid-1994. A preliminary analysis of these records was performed in order to determine the type of transaction that occurred, the parties that were involved and the status of the property which was conveyed or transferred (Appendix G).

Records and documents retrieved include mineral deeds, assignments of interests or royalties, bills of sale and subleases. The majority of the transactions involved assignments of leases on federal acreage. There were only a handful of state and fee lease assignments. Transactions involved very small amounts of acreage (40 gross acres) to very large areas of up to 16,000 gross acres. Most of the transactions involved a few hundred to approximately 1000 gross acres. Where working interests were conveyed and amounts were recorded, they varied from a few percent to up to 100 percent working interest. Only a few documents actually recorded the cash value of the transaction.

Transactions were eliminated from the overall list if they did not appear to be 'arms-length' in nature, or were not subject to normal market conditions. Such transactions included those where companies or individuals assigned royalties or rights to related or affiliated companies or individuals; for example, estate transfers involving trusts and/or wills. This eliminated approximately 25 of the transactions.

The remaining records were further analyzed for properties which consisted of primarily producing vs. nonproducing acreage. The majority of the transactions (over 60 percent) involved producing wells and/or acreage. The remainder involved predominantly nonproducing acreage. Most of the transactions found involving producing acreage were deemed to be somewhat to very comparable geologically. In addition most of these transactions were within 20 miles of NPR-3 and are considered to represent good market data in highly comparable areas. Further analysis should reveal the exact terms of each transaction, the actual area and amount of interest transferred and the price per net mineral acre paid or received.

Transactions involving producing acreage were retrieved for areas within several nearby fields, including Salt Creek, Sage Spring Creek, Burke Ranch, Cole Creek, Brooks Ranch and Big Muddy. These fields have established production from many horizons but produce primarily from the Frontier (Second Wall Creek Member), Dakota and Shannon formations which are similar to Teapot Dome field.

Salt Creek Field, only five miles to the northwest of NPR-3, has had as many as 630 productive wells covering an area of 9400 acres. Estimated Ultimate Recovery (EUR) was not readily available for this field although it has produced in excess of 515 million barrels of oil mostly from the Frontier. Sage Spring Creek eight miles south of NPR-3, produces from Frontier and Dakota sands in some 36 (plus) wells. The EUR for Sage Spring Creek is 8.5 MMBO (11.6 MMBO Primary and Secondary recovery).

Average primary recovery at Sage Spring Creek is 240,000 BO per well. Burke Ranch field is seven miles south of NPR-3 and produces from the Dakota Formation over an area of 1840 acres.

The eight wells at Burke Ranch have an EUR of 250,000 barrels of oil per well. The Cole Creek field produces oil from 50 wells covering 3000 acres and is situated 20 miles south of NPR-3. The EUR for Cole Creek is 7 MMBO (Primary) for an average of 140,000 BO per well from the Dakota and Lakota formations. Brooks Ranch field 33 miles south of NPR-3, covers an area of 3300 acres and consists of 20 Frontier wells. Brooks Ranch averages 130,000 BO (EUR) per well. The Big Muddy field located 30 miles south of NPR-3 is comprised of nearly 300 Shannon and Frontier wells on 4040 acres. EUR from the Frontier and Shannon at Big Muddy is approximately 30 MMBO. The average recovery per well is 100,000 BO.

The actual terms of these transactions (purchase price, reserves etc.) are currently being researched as part of Phase II.

2.2.3.2 Mineral Deeds

Research in the county records over the past three years found seven transactions involving mineral conveyances or mineral deeds where fee mineral interest was sold between two parties (Appendix H). A cursory glance indicates that most of these transactions involved mineral interests with production already established on the acreage. Most of the transactions are in the vicinity of the subject properties. The terms of the deal and an accurate description of the mineral interest purchased is currently being researched by this Consultant as part of Phase II.

2.3 FACILITY AND EQUIPMENT MARKET

Rather than value the equipment described in Section 1.10 of this Report by depreciation methods, we have estimated the market value. Basically we have canvassed the domestic industry and have determined a value for this equipment which reflects what a buyer is willing to pay. A listing of contacts made in this effort is included as Table 2.2. If we have obtained a quantified estimate, that is the value we will allocate for that piece of equipment. In the case of equipment with no such estimate, we may have arrived at a market value by using a percentage of original cost. For instance, we know the market supports 10-year-old gas processing equipment at 10 to 15 percent of original cost with a specific customer identified. A salvage yard will pay 5 percent of original cost for the same equipment with no identified customer.

TABLE 2.2

Contacts for Survey of Equipment Market

1. Terry Kloth, Torch, Bakersfield, CA.
2. Roger or Terry Hilton, Andersonics, Santa Paula, CA.
3. John Higgins, Marathon Oil Co. Mosherville MI.
4. Bill Young, ex-Struthers Co, (steam generators & water treatment), Winfield, KS 31621-0672.
5. Dave Burkhalter, Delhi. Gas Pipeline, Dallas, Texas
6. Bob Fair or Guy Johnson, Rino Equip, Odessa, Texas
7. Paul Morrow, South Texas Treaters, Midland, Texas
8. George Grame, C&G Equipment, Midland, Texas

NPR-3 has a substantial amount of warehouse stock. This equipment inventory is basically comprised of numerous small ticket items needed for the daily field operations. This equipment may hold a percentage value like that described above. A maximum value may be realized by entering an alliance agreement with a supply company where they can service the NPR-3 operations and others using the inventory in the warehouse at the time of transfer.

Finally there is a salvage value to some producing equipment. Tubing and pumping units from wells that are plugged and abandoned (P&A'd) should have some market value. That value is captured in the P&A liability and has been credited toward that P&A liability, as discussed in Section 1.11 of this Report.

It may take some time and effort to realize the maximum market value for all of this equipment. For evaluation purposes, we have assumed that all of this equipment, with the exception of the electrical equipment to be salvaged at the end of field life, will be marketed in the year after ownership transfer. To be consistent with this assumption, the market value of all equipment has been conservatively estimated.

3. HIGHEST AND BEST USE DETERMINATION

3.1 INTRODUCTION

In conformance with standard appraisal techniques the property to be appraised must first be examined for its *Highest and Best Use*. This Appraiser is using the following definition for *Highest and Best Use*:

> "Either some existing use on the date of the transaction, or one which the evidence shows was so reasonably likely in the near future that the use would have affected its market price on the date of the transaction and would have been taken into account by a purchaser under fair market conditions" (emphasis added).

This definition has been adopted from the *Uniform Appraisal Standards for Federal Land Acquisitions*, 1992.

With this in mind, it becomes clear that an oil or gas property will have substantially different *Highest and Best Uses,* depending on its stage of development. Clearly, the *Highest and Best Use* of a producing oil or gas property is to produce income from the sale of production. Likewise, on the other end of the development spectrum, the *Highest and Best Use* of rank wildcat acreage, is the present value of the future bonuses and rentals that the property will bring to the landowner. Between these two extremes, properties may be nonproducing, although the reserve may be proven, or the property may be a prospect defined by seismic, by subsurface control, or by other means.

The *Highest and Best Use* of a nonproducing property may occasionally be related to the ability to produce income, if such income is shown to be reasonably close in the future. On the other hand, a prospect cannot be considered to be anywhere near the stage of income from oil production, partially because there may be a very substantial question with regard to actual discovery of reserves, and partially because the timing of drilling may be impossible to determine.

The acreage in NPR-3 presents properties with three types of *Highest and Best Use*. The types of uses are known in the oil and gas industry, in simplistic terms, as:

1. producing properties (wells),
2. undrilled development sites offsetting producing wells, and
3. nonprospective acreage.

Properties with the first two of these uses are represented by market transactions on the high end of the spectrum with unit values on a per-barrel-of oil or per-acre basis increasing in value from the development locations to the producing wells. Nonprospective acreage typically has the lowest per-acre value. Figure 3.1 shows typical unit values as well as the apportionment thereof between the owners of various parts of the mineral estate.

Apportionment is an appraisal of the portion of the overall Fair Market Value accruing to each of dissimilar types of interests, such as leasehold versus executory versus nonparticipatory royalty interests and others. This is in contrast to Division, which is a clerical division of a Fair Market Value within a group of similar rights owners, such as leasehold interests, overriding royalty interests, unitized land owners' interests, etc.

3.2 PRODUCING PROPERTIES

The producing wells in NPR-3, in Teapot Dome Field, Natrona County, Wyoming, have as their Highest and Best Use the generation of income from oil and gas production. The 632 active producing wells comprise the vast majority of the acreage being appraised at NPR-3. The reserves associated with these producing wells will be valued for the purposes of estimating Fair Market Value using the Income Method. This method is based on predicting the future cash flow associated with sales of future oil and gas liquids production.

OIL PROPERTY ALLOCATIONS

(TYPICAL)

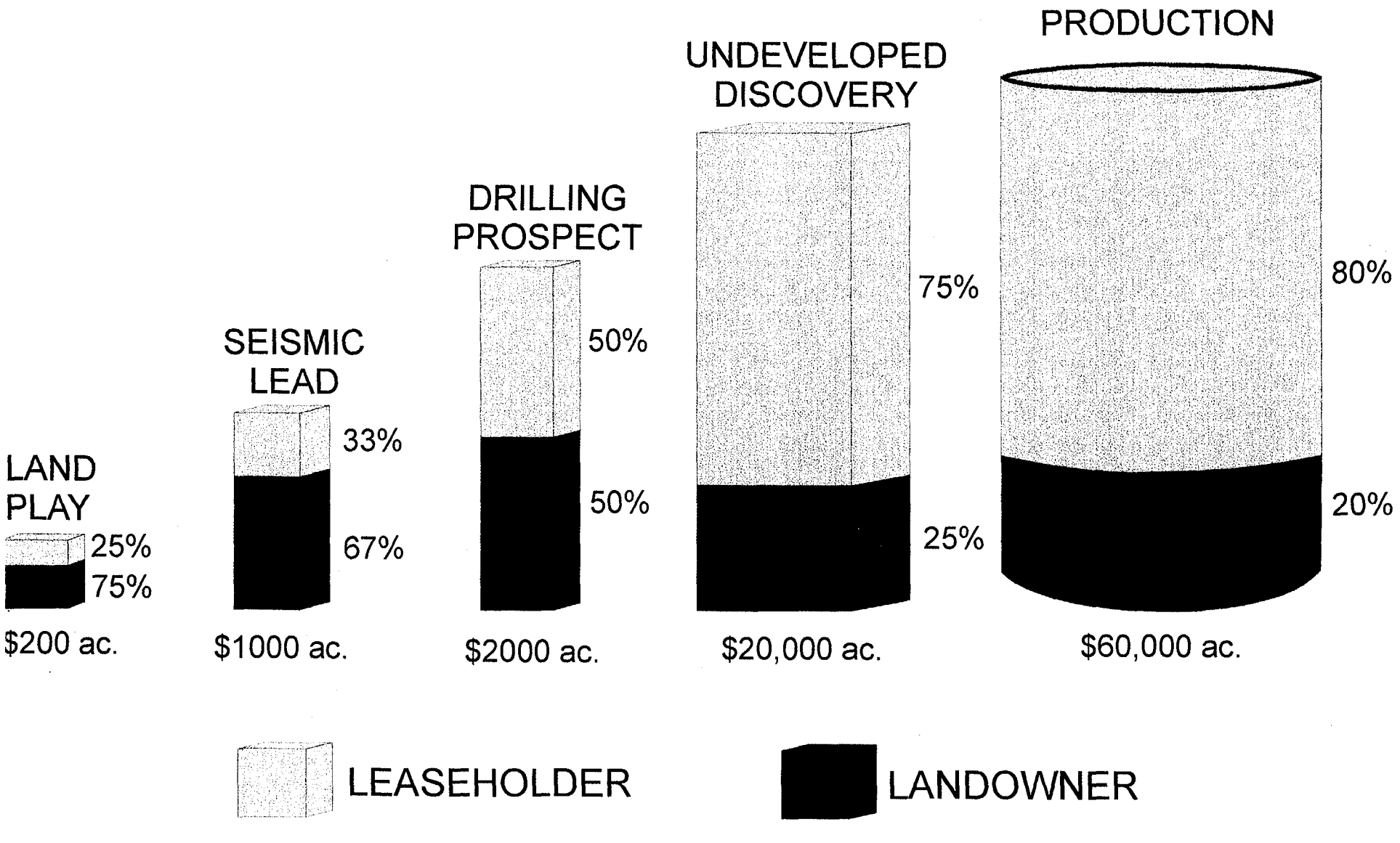


FIGURE 3.1

3.3 UNDRILLED DEVELOPMENT LOCATIONS

3.3.1 Proved Undeveloped and Probable Locations

There are also six likely developmental locations immediately offsetting some of the producing wells which, until they are drilled, would represent the second category of *Highest and Best Use* of undrilled development sites. These locations represent Proved Undeveloped and Probable locations for exploiting reserves from the Tensleep reservoir, as discussed in more detail in Section 1.7.1.3 These wells are judged to be reasonably certain to be drilled and to encounter commercially productive hydrocarbons. They will also be valued using the Income Method, with appropriate adjustments for the geologic risk associated with each well.

3.3.2 Possible Locations

Several additional development well locations have been identified by this Appraiser and/or planned to be drilled by the DOE, which have a higher associated risk of being uneconomic. These locations include three Tensleep locations and several Shannon and Shale wells. In addition, several wells have the potential to be deepened to the Shales, which are considered to be possible by this Appraiser. They cannot be considered to be more likely than not to recover commercial quantities of hydrocarbons. Their *highest and best use* is as drilling prospects, with a higher value per acre than rank exploratory acreage, but insufficient with which to project cash flow in the future from drilling and selling oil and gas production. However, since these are infill locations within the existing productive acreage, it would not be practical to trade this acreage separately. It will be valued with existing production.

3.4 NONPROSPECTIVE ACREAGE

NPR-3 also includes acreage which would fall into the nonprospective acreage designation. This is acreage that is structurally low on the producing anticline. Generally, this may also include acreage over which seismic data may or may not have been acquired, but where the interpretation

has shown no specific promise of any prospects. It can also be acreage where no data are available or which is so far removed from any type of data that it must be considered rank exploratory acreage. Still, oil companies will be willing to lease such acreage from time to time to conduct exploration. We note that much of the nonprospective acreage at NPR-3 would be considered held by production (HBP) and not available for leasing. The present value of the future income from bonuses and rentals represents the overall value of the property, while the oil company's actual cost for such leases comprises its share of the overall value. This will be quantified in Phase II.

3.5 HIGHEST AND BEST USE OF THE PROPERTY INTERESTS APPRAISED

The *Highest and Best Use* of the property interest appraised herein is therefore the following:

1. For generation of income from producing properties: the 632 active producing wells.

2. For evaluation of undrilled development locations: the six Proved Undeveloped and Probable locations in the Tensleep.

3. For leasing: all those remaining tracts.

3.5.1 Comparison with Appraisal Institute Standards

An alternate approach is recommended by the Appraisal Institute (1992), which defines *Highest and Best Use* as: "The reasonable probable and legal use of vacant land or improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value." Each of these criteria must be met sequentially.

For oil, gas and mineral properties the comparable definition can be applied by testing the candidate uses sequentially against each of five criteria:

1. Physically possible. The property must possess adequate size, dimension, shape, quality of reservoir and resource, and geotechnical quality to support the proposed use. As an example, an oil reservoir consisting of many, very thin interfingering sands and shales may not be physically possible to produce.

2. Legally permissible. The proposed use of the property must conform to all local, state and federal zoning and use restrictions for the property. A negative example is an otherwise well-tested stone quarry, ready to develop except for the lack of a mining permit.

3. Financially feasible. The proposed use must be capable of providing a net return to the property owner or leaseholder. Here, the uncertainty of, for example, the amount and category of gas reserves could reduce an undeveloped location to an exploratory drilling prospect.

4. Maximally productive. Of those physically possible, legally permissible, and financially feasible uses, the *Highest and Best Use* for a property is that use which results in the highest value; that is, the use that provides the greatest net return to the property owner and leaseholder in combination, and as of the date of the evaluation or firmly planned for the immediate future.

5. Economically fitting. This fifth criterion adds: the proposed use must fit with the constraints with regard to oil and mineral development of relevant firms, institutions, governments, and markets. For example, impending environmental or surface access regulations on the area as a whole may make the proposed use of a mineral property problematic.

3.5.2 Application to NPR-3

Depending on the location with regard to the results of the geological and geophysical interpretation, this Appraiser searched for candidate uses ranging from leasing to oil companies

to generation of income from oil and gas production. In this section we will apply the Appraisal Institute criteria for *Highest and Best Use* to double check our prior selection. Note that once a criterion is not met, the sequential test is suspended for that possible use, and another use must be tested.

It is seen from Table 3.1 that NPR-3 fulfills all sequential criteria for the current use as producing wells, development locations and as exploratory acreage; but not for use as drilling prospects or seismic options.

3.5.3 Conclusions with Regard to Highest and Best Use

The Fair Market Value is to be estimated with reference to the property's *Highest and Best Use* -- that is, the highest and most profitable use for which the property is suited and needed or likely to be adapted to in the near future without speculation.

Specifically, this Appraiser has carefully studied the production history and geology of the property. We have fairly shown that producing wells and development locations offsetting these wells exist. Also, exploratory drilling for oil and gas is not reasonably likely. These considerations would be brought forward and given substantial weight in a bargaining over the property between willing and knowledgeable buyers and sellers. The remainder of the appraisal property does not even contain seismic leads, so its *Highest and Best Use* is for the generation of income to the mineral rights owner by leasing of oil and gas exploration rights to oil companies.

TABLE 3.1
SEQUENTIAL TEST FOR HIGHEST AND BEST USE

Candidate Use	CRITERIA MET				
	1 Physically Possible	2 Legally Permissible	3 Financially Feasible	4 Maximally Productive	5 Economically Fitting
Producing Wells	Yes	Yes	Yes	Yes	Yes
Development Locations	Yes	Yes	Yes	Yes	Yes
Drilling Prospects	No				
Seismic Leads	Yes	Yes	Yes	No	
Exploratory Acreage	Yes	Yes	Yes	Yes	Yes

4. SURFACE AND WATER RIGHTS

4.1 INTRODUCTION

The surface and water resources at NPR-3 are managed by the DOE out of their Casper office. An independent limited appraisal of the surface and water rights at NPR-3 has been prepared by a Certified General Real Estate Appraiser, under the direction and supervision of this Appraiser. The surface appraisal report is presented in its entirety in Appendix I of this Report. A summary of appropriate facts is included in this section.

4.2 SURFACE

The surface of the subject property is characterized by prairie with occasional sagebrush, several cut ravines and sandstone bluffs. The DOE currently leases grazing rights to local ranchers for one month per year for about 2,000 sheep. The revenue generated from this grazing is $1.50 per sheep, or $3,000 per year. BLM personnel in Casper have indicated that more intensive grazing usage could be sustained by the surface acreage at NPR-3, and that this usage is not incompatible with current oil and gas production operations. The level of usage suggested by the BLM for which they issue permits on similar nearby property is 6 to 12 acres per animal unit month (AUM), essentially all year long. An AUM is the amount of acreage of forage required to sustain one animal unit (one cow or five sheep) for one month. An average of 9 acres per AUM, results in the following calculation for the 9,321 acres of NPR-3:
9,321 acres / 9 acres per AUM x 5 sheep per AUM = 5178 sheep.

The BLM rate for issuance of grazing permits is currently $1.35 per AUM. Thus grazing at NPR-3 at 9 acres per AUM for 12 months per year could yield annual grazing income as high as $16,800.

Many species of wildlife are typically present on NPR-3, including two game species: deer and pronghorn. No hunting is permitted under DOE management.

4.3 WATER

Wyoming water is typically not purchased and sold as a commodity apart from the surface value of the property. The DOE has water rights permits for the use of 203.43 acre feet of water per year from Teapot Creek, and 5049.5 gallons per minute of ground water from water wells. This water is primarily used in the DOE's steamflood operations. If a new use of water is desired other than the one originally permitted for, a petition to the Board of Control for the change in question is required.

4.4 HIGHEST AND BEST USE

The definition of *highest and best use* has been provided previously in this Report. The subject consists of 9,321 acres of land with present surface uses of oil and gas production activities and limited livestock grazing. Use of the surface in surrounding areas is for sheep and cattle ranching. The subject acreage is considered to be too small to be an economic agricultural unit, but would be desirable acreage to add to nearby ranches. This use of the surface at NPR-3 meets all the tests for *highest and best use* described in the previous section. Therefore, the *highest and best use* of the surface acreage at NPR-3 is considered to be as livestock grazing for addition to nearby ranches. This use is compatible with existing oilfield operations.

4.5 COMPARABLE SALES

The surface appraiser searched the central and northeastern Wyoming real estate market for sales of properties comparable to the subject. Twenty sales of ranch properties that occurred from 1994 to present were analyzed. The six sales most similar to the subject are described in detail in Appendix I. These sales, three of which involved properties with producing oil and gas wells similar to those on the subject, are considered to provide reliable indications of the surface value of the Government's surface rights at NPR-3. The values of the comparable sales ranged from $50.10 per acre to $88.56 per acre. Fully adjusted (as described in Appendix I), the indicated value for the subject property is in the range of $70.05 per acre to $79.50 per acre. The three

sales of properties encumbered with oil wells indicate a value of $72.92 per acre to $79.50 per acre per the subject.

APPENDIX A

BIBLIOGRAPHY

BIBLIOGRAPHY

Bean, Daniel W., Harvey R. Duchene and Walter A. King, 1984, Edsel Field (Minnelusa), Powder River Basin, Wyoming, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton, p. 71-73.

Fluor Daniel, 1993, Steam drive economic viability, Vicki Stamp.

_____, 1995, EOR Steam Drive Project Mini-Expansion, (author unknown).

_____, 1995, NPOSR - CUW AOP status report (C. Dunn to C. Turner).

_____, 1995, Naval Petroleum Reserve No. 3, FY 1995 Oil and Gas Reserves Evaluation.

_____, 1995, Right Sizing the Naval Petroleum and Oil Shale Reserves - Colorado, Utah, and Wyoming.

_____, 1996, NPOSR-CUW orientation briefing.

Foote, Cecil G., 1996, Memo on NPR-3 Gas Reserves

Fryberger, Steven G., 1984, The Permian Upper Minnelusa Formation, Wyoming: Ancient example of an offshore-prograding Eolian sand sea with geomorphic facies, and system-b boundary traps for petroleum, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton, p. 241-247.

George, Gene R., 1984, Cyclic sedimentation and depositional environments of the Upper Minnelusa formation, Central Campbell County, Wyoming, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton, p. 79.

Gribbin, D.J., 1952, Completion Report, Exploratory Well No. 1-6-10, Naval Petroleum Reserve No. 3, Natrona County, Wyoming.

Hendricks, Marvin, 1996, Memo, Shannon Steamflood Proved Undeveloped Reserves and feasibility of future steamflood expansion.

Interagency Land Acquisition Conference, 1992, Uniform Appraisal Standards for Federal Land Acquisitions, 334 p.

Kelly, Anne O., 1984, Significance of interdune deposits in the Upper Casper formation, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton, p. 97.

Lawrence, Allison, 1987, Northern Second Wall Creek Reservoir Engineering Study.

LeBeau, Jay A., 1996, Preliminary geological characterization of the Tensleep petroleum play, Naval Petroleum Reserve #3, Midwest, Wyoming.

McBain, J. Duncan, 1984, Buck Creek Field, Niobrara County, Wyoming, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton, p. 111.

Moore, W. Richard, 1984, North Fork and Cellars Ranch Fields, Johnson County, Wyoming: Examples of Late Permian tectonism and resultant differential sedimentation, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton, p. 341.

Olsen, D.K., et al., 1993, Case history of Steam Injection Operations at Naval Petroleum Reserve No. 3, Teapot Dome Field, Wyoming: A Shallow Heterogeneous Light-Oil Reservoir, SPE 25786, presented at the International Thermal Operations Symposium, Bakersfield, California, 8 - 10 February, 1993.

Petroleum Information Corporation, 1996, Rocky Mountain Region Report, Vol. 69, No. 6, January 9, 1996.

Rhodes, R.E., 1981, Teapot (Naval Petroleum Reserve No. 3), in Wyoming Geological Association, Powder River Basin, Oil and Gas Fields Symposium (two volumes), pp. 413-417 plus map in pocket.

Trekel, C.A., 1930, Compilation of data on Naval Petroleum Reserve No. 3 (Teapot Dome), Natrona County, Wyoming: Submitted to Director, Naval Petroleum and Oil Shale Reserves.

Trotter, John F., 1984, The Minnelusa Revisited, 1984, *in* Wyoming Geological Association, 35th Annual Field Conference, Guidebook, 1984, The Permian and Pennsylvanian geology of Wyoming, ed. Jim Goolsby and Doug Morton.

U.S. Department of Energy, 1994, Fiscal Year 1995 Annual Operating Plan.

_____, 1995, Final statewide environmental assessment, EA-1008, for continued development of Naval Petroleum Reserve No. 3 (NPR-3), Natrona County, Wyoming.

_____, 1996, Naval Petroleum Reserve No. 3 FY 1996 drilling program and field profitability, November 1995 analysis.

_____, 1996, Listing of NPR-3 development wells drilled after 01 October, 1995, and NPR-3 developmental wells remaining to be drilled in FY 1996.

Wyoming Oil and Gas Conservation Commission, 1995, Report of the Commission on Cause No. 1, Order No. 6, Docket No. 3-96, regarding bonding requirements for Plugging and Abandonment of wells changing hands between Conoco, Inc. and Westport Oil and Gas Co.

APPENDIX B

DESCRIPTION OF LANDS BEING APPRAISED

APPENDIX B

Description of Lands Within
Naval Petroleum Reserve #3

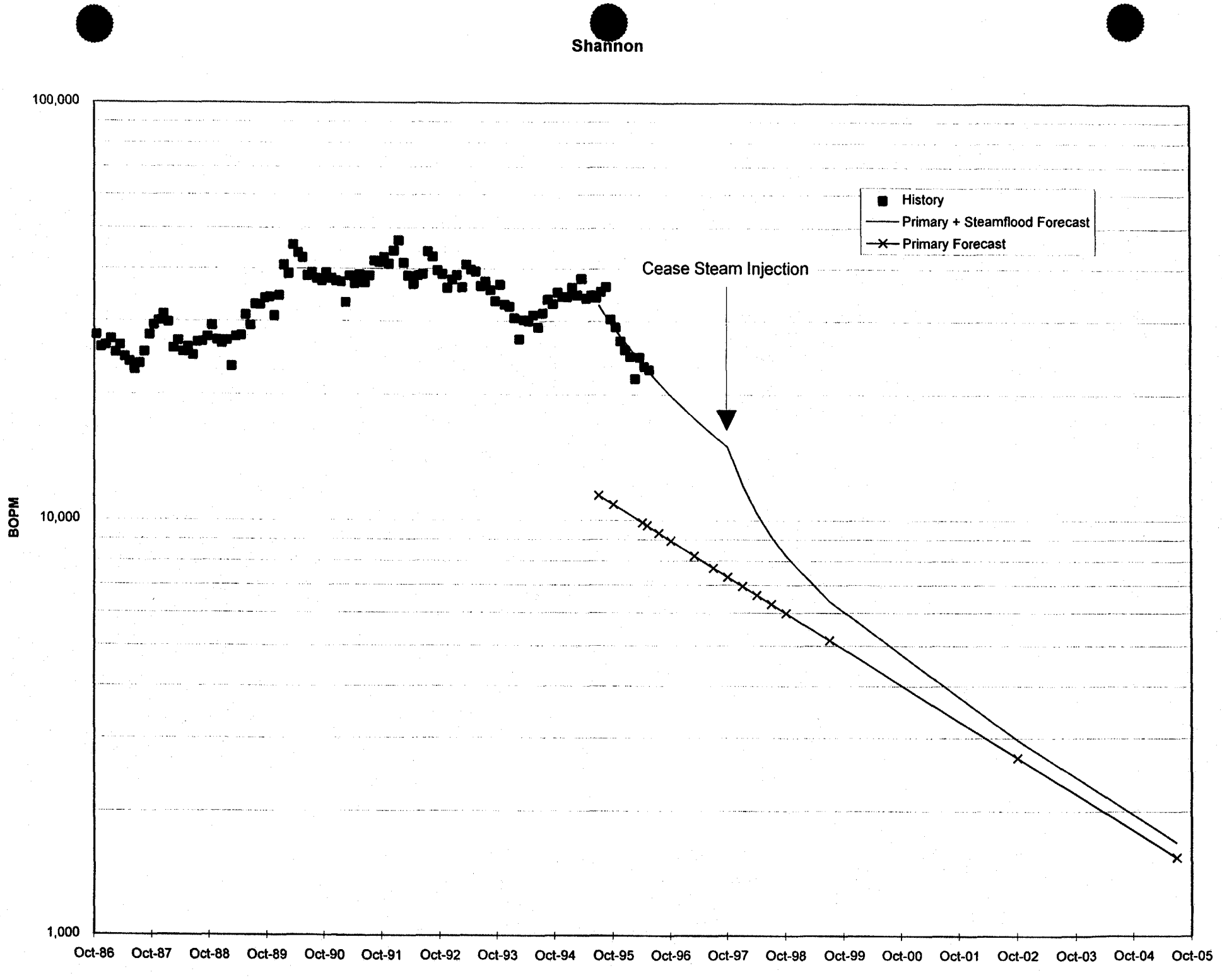
On April 30, 1915, President Wilson created from lands forming a part of Petroleum Reserve No. 8 withdrawn July 2, 1910, Naval Petroleum Reserve No. 3 to "be held for the exclusive use or benefit of the United States Navy until the order is revoked by the President or Congress". The lands included therein and totaling 9,481 acres were described as follows:

T. 38 N., R 78 W.,	Sec. 2, Lots 3 and 4, S½ of NW¼, SW¼, SW¼ of NE¼, W½ of SE¼;
	Sec. 3, all;
	Sec. 4, Lots 1, 2, S½ of NE¼, NE¼ of NW¼, N½ of SE¼, SE¼ of SE¼;
	Sec. 9, E½ of NE¼, NE¼ of SE¼;
	Sec. 10, all;
	Sec. 11, W½ of NE¼, W½, SE¼;
	Sec. 14, all;
	Sec. 15, N½, N½ of SW¼, SE¼ of SW¼, SE¼;
	Sec. 22, NE¼, NE¼ of NW¼, E½ of SE¼;
	Sec. 23, all;
	Sec. 26, NW¼ of NE¼, N½ of NW¼;
T. 39 N., R. 78 W.,	Sec. 16, NE¼ of SW¼, S½ of SW¼, SW¼ of SE¼;
	Sec. 20, E½ of NE¼, SE¼;
	Sec. 21, all;
	Sec. 22, SW¼ of SW¼, SW¼;
	Sec. 27, W½ of NE¼, W½, SE¼;
	Sec. 28, all;
	Sec. 29, E½, E½ of NW¼, N½ of SW¼, SE¼ of SW¼;
	Sec. 32, N½ of NE¼, SE¼ of NE¼;
	Sec. 33, N½, N½ of SW¼, SE¼ of SW¼, SE¼;
	Sec. 34, all;
	Sec. 35, SW¼ of NW¼, W½ of SW¼, SE¼ of SW¼.

While included in Naval Petroleum Reserve No. 3 by the order of April 30, 1915, the 160 acres in Section 16, T. 39 N., R 78 W., belonged to the State of Wyoming; title vested in the State to the whole of Section 16 on July 10, 1890, the date of entry of Wyoming into the Union, by virtue of the provisions of Section 14 of the Act of Congress approved July 25, 1868, (15 Stat. 178) (covering school sections) inasmuch as this section was not known to be of mineral character on July 10, 1890 (confirmed by report of February 13, 1929 of H.W. MacFarren, Mining Engineer of the General Land Office). Excluding these 160 acres the area of Naval Petroleum Reserve No. 3 is therefore 9,321 acres. (See Compilation of Data on Naval Petroleum Reserve No. 3 (Teapot Dome), May 31, 1930, by Inspector, Naval Petroleum and Oil Shale Reserves, at Pages 13-14.)

APPENDIX C

PRODUCTION DECLINE CURVES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1,000
BOPM
History
Primary + Steamflood Forecast
Primary Forecast
Cease Steam Injection
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Oct-87
Oct-88
Oct-89
Oct-90
Oct-91
Oct-92
Oct-93
Oct-94
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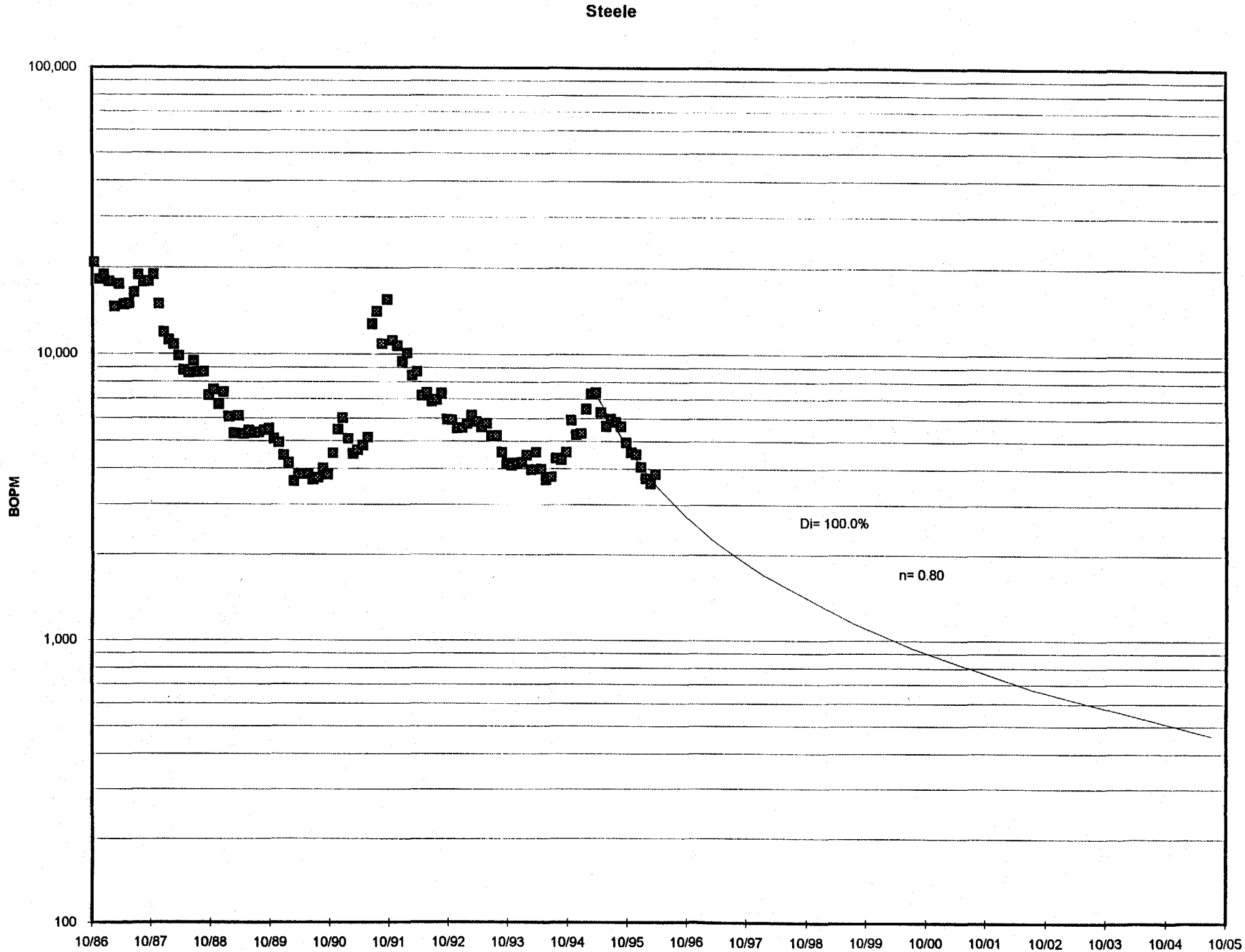
Oct-05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10/87
10/88
10/89
10/90
10/91
10/92
10/93
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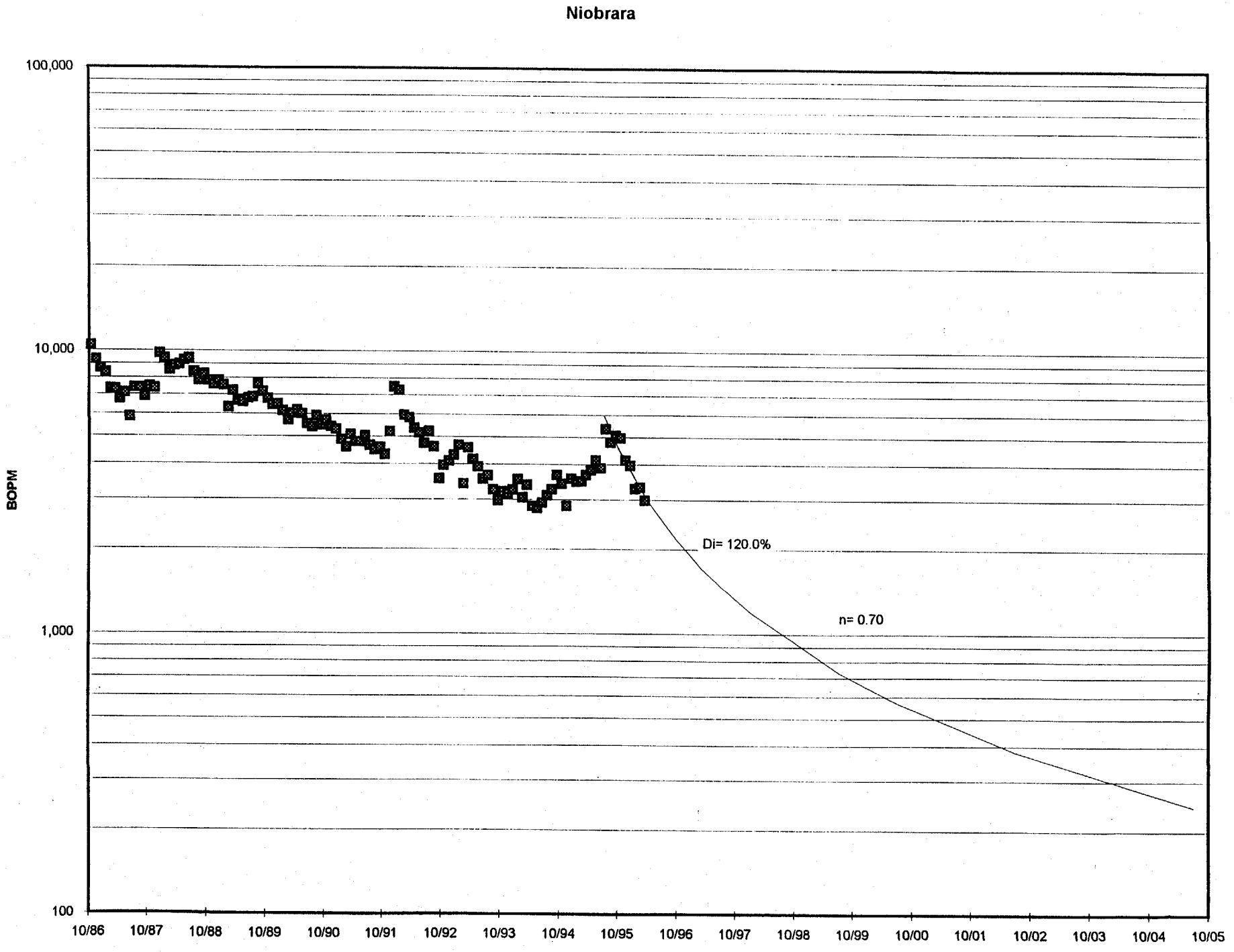
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10,000
1,000
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BOPM
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10/87
10/88
10/89
10/90
10/91
10/92
10/93
10/94
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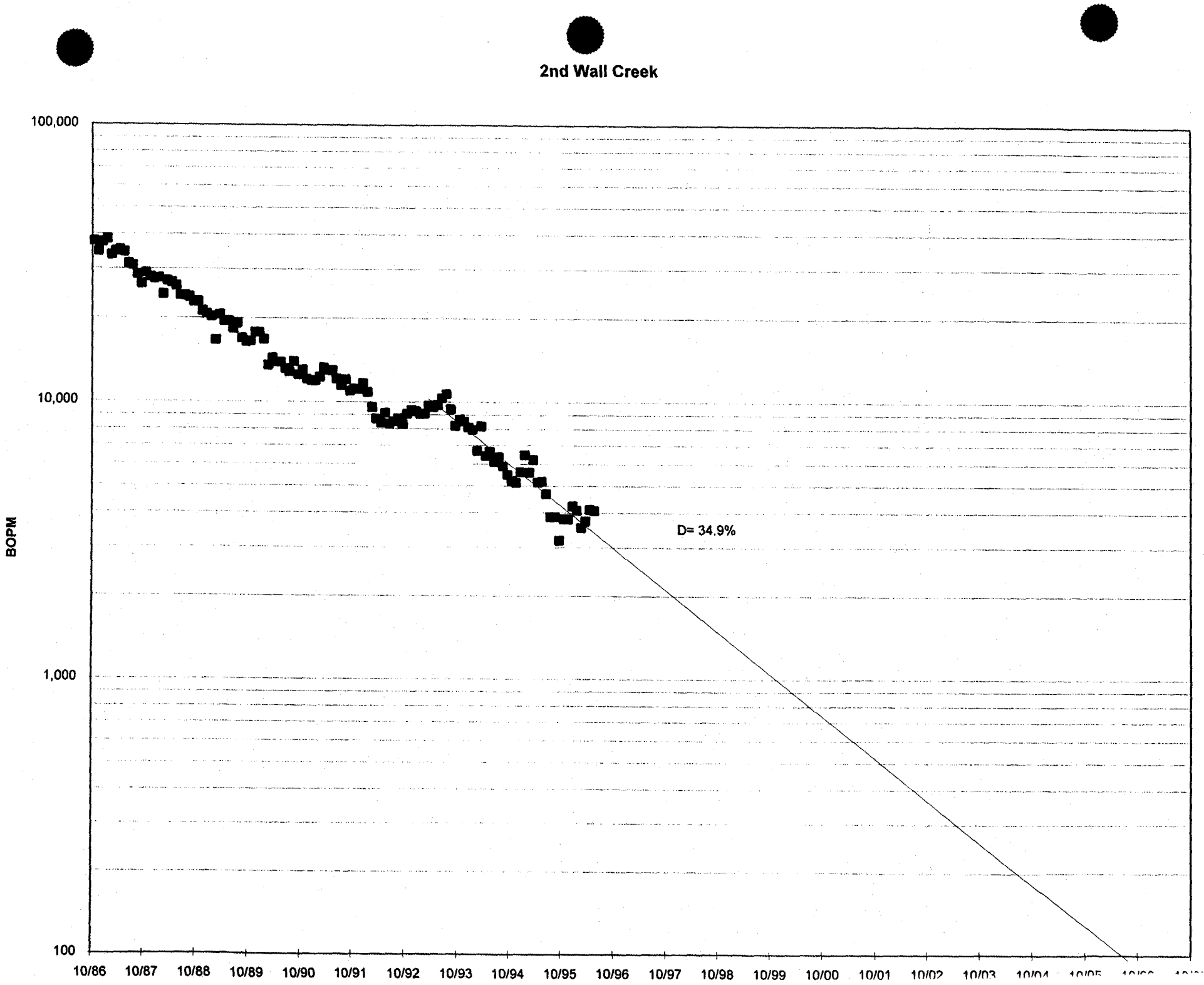
10/05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1,000
100
BOPM
D= 34.9%
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10/88
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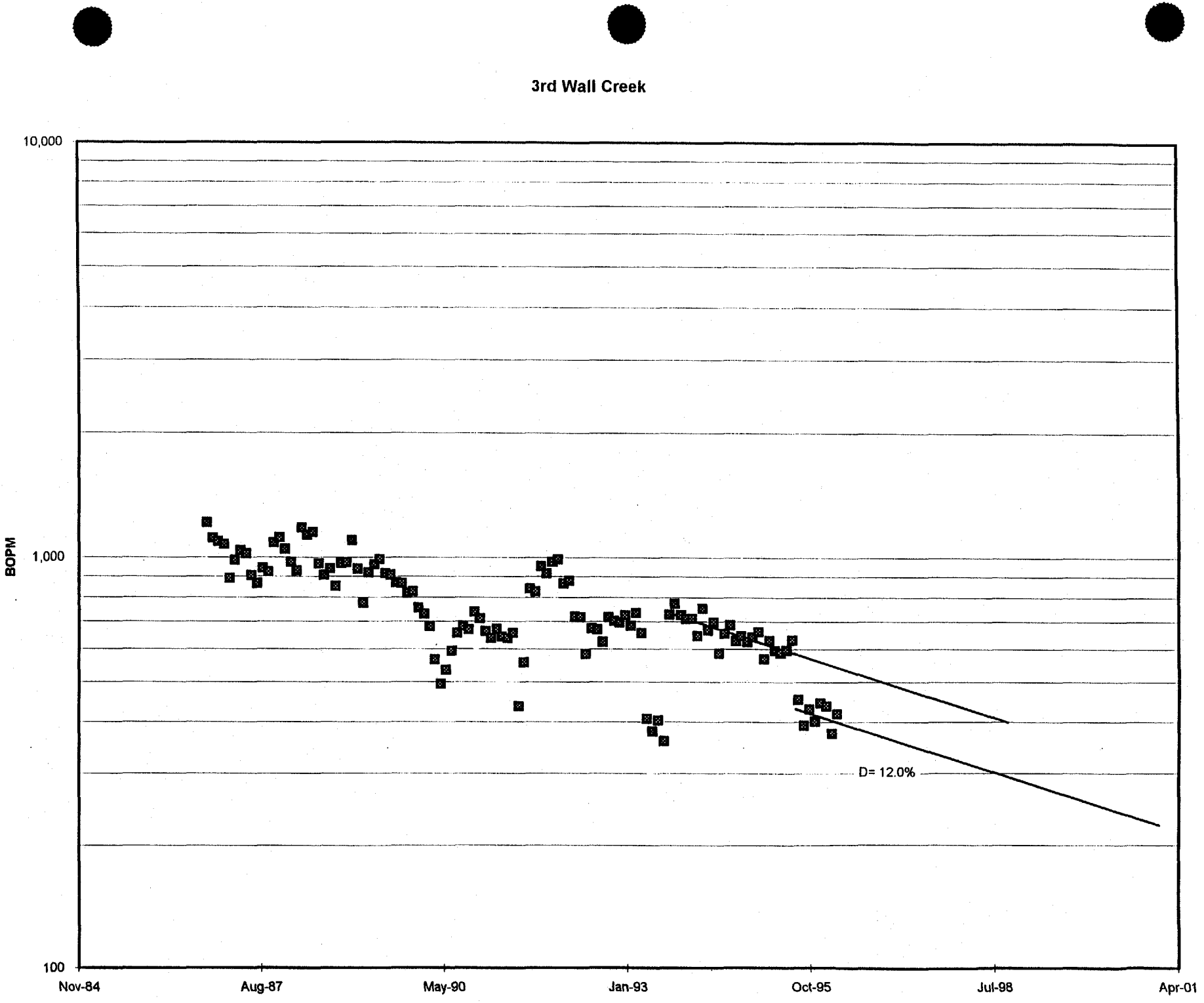
10/03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Jan-93
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Apr-01
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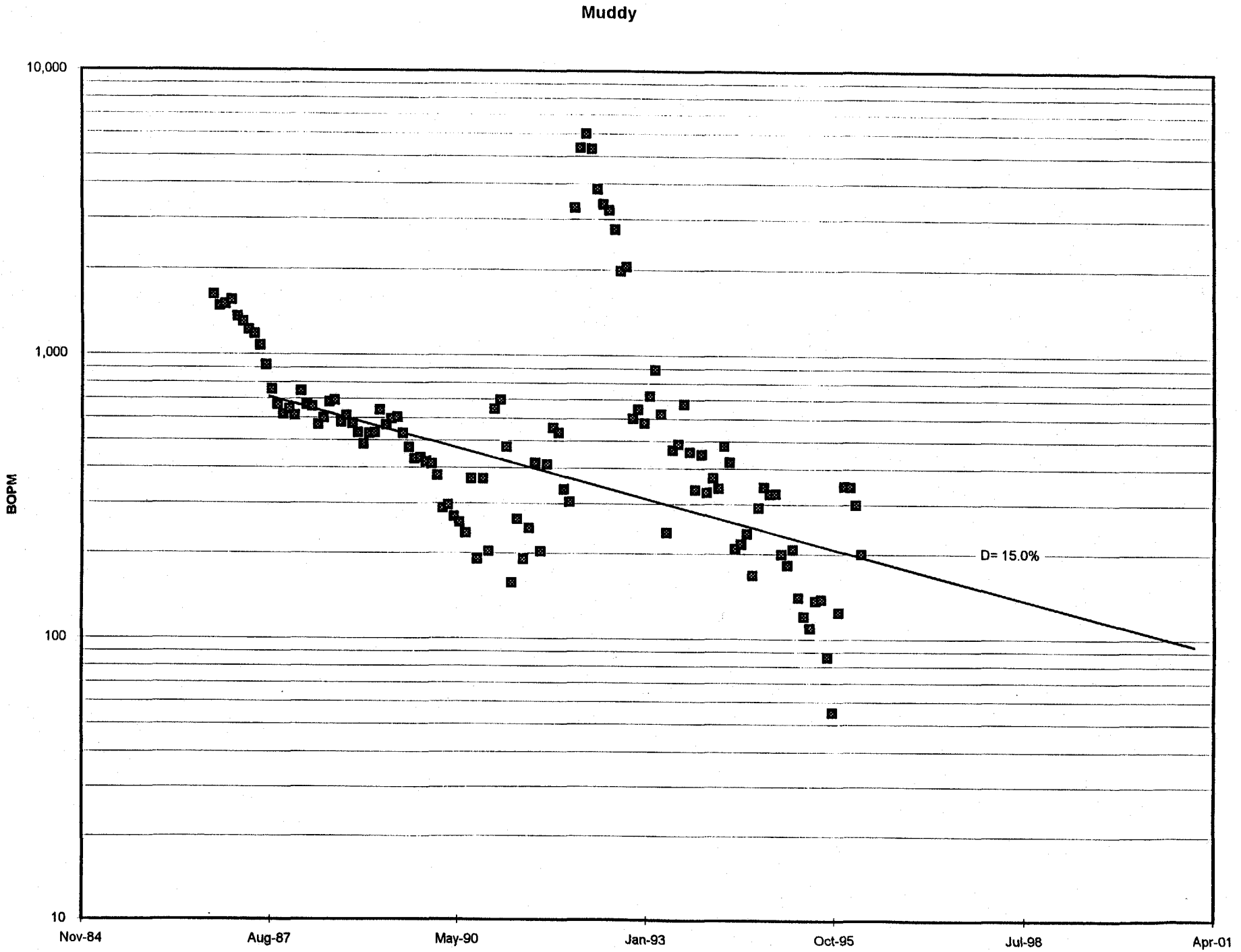
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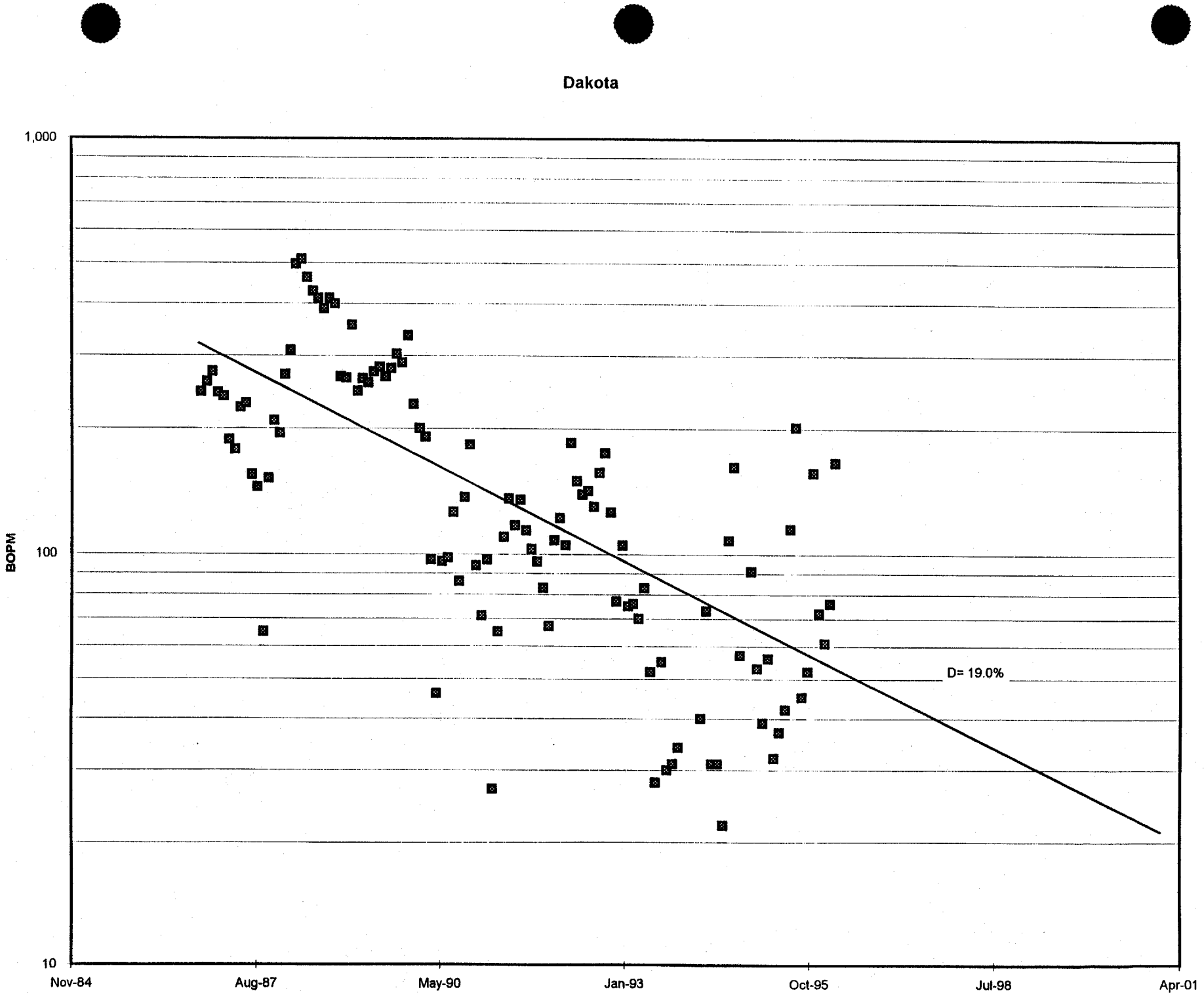
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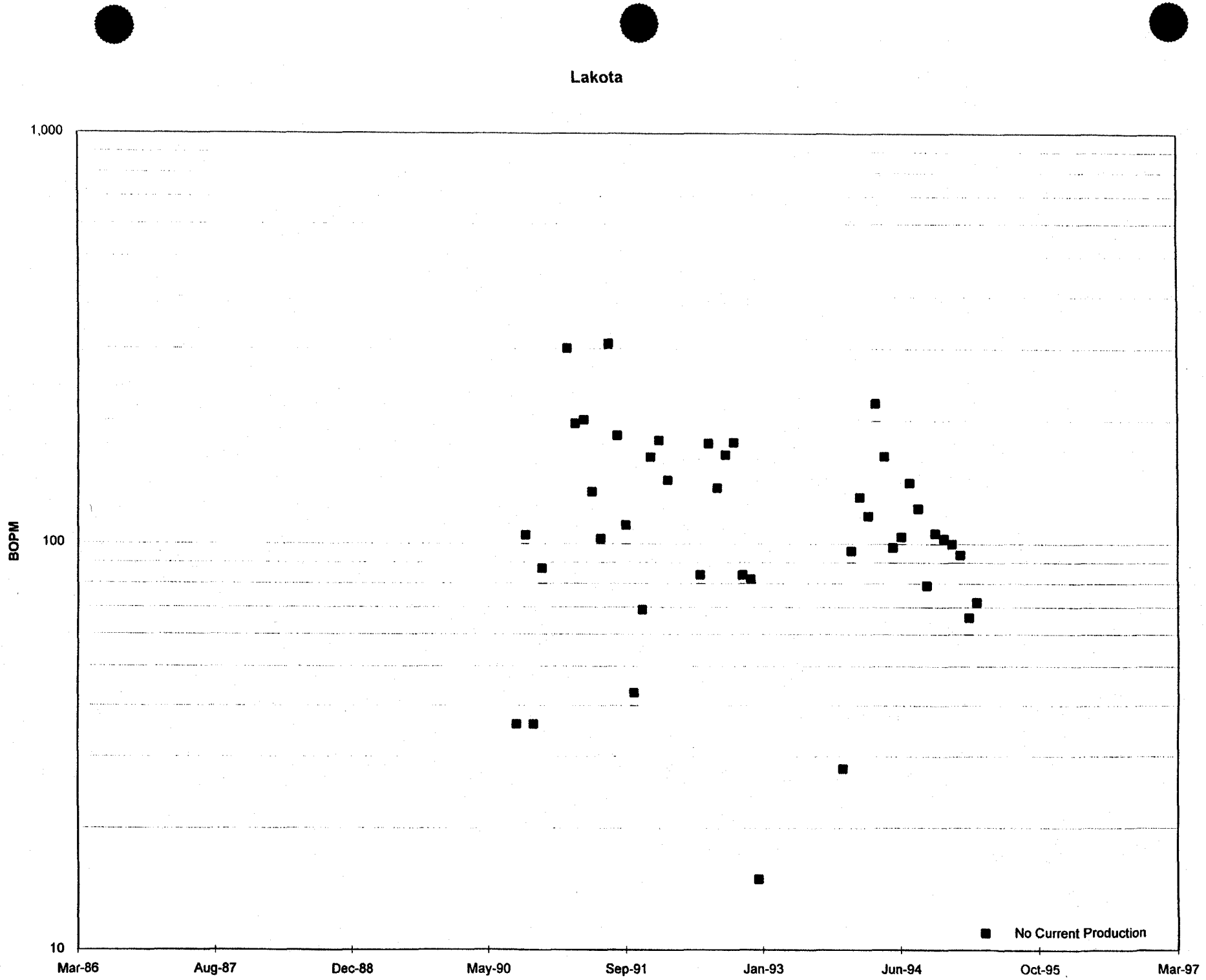
Lakota
1,000
100
10
BOPM
Mar-86
Aug-87
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Jan-93
Jun-94
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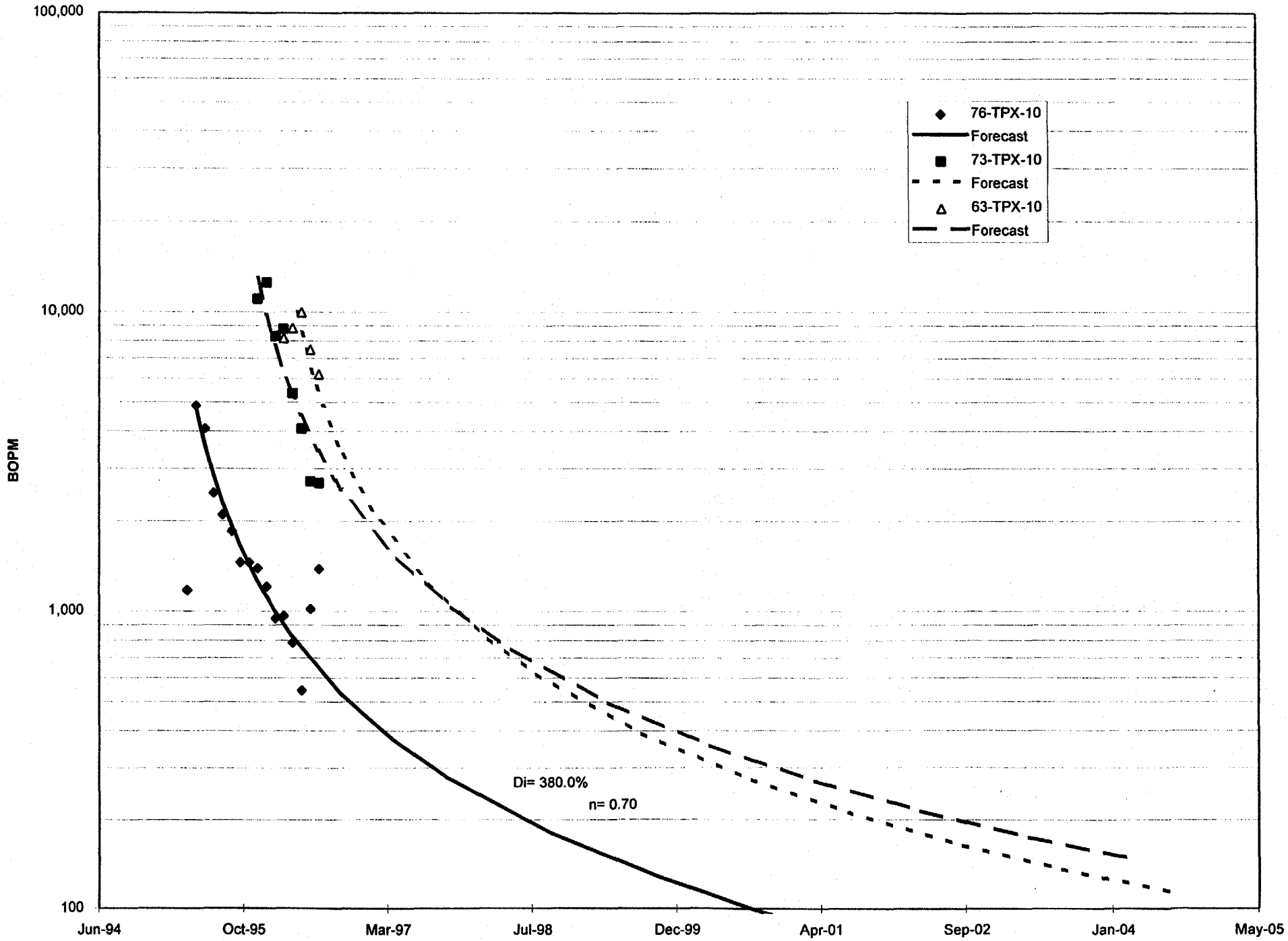
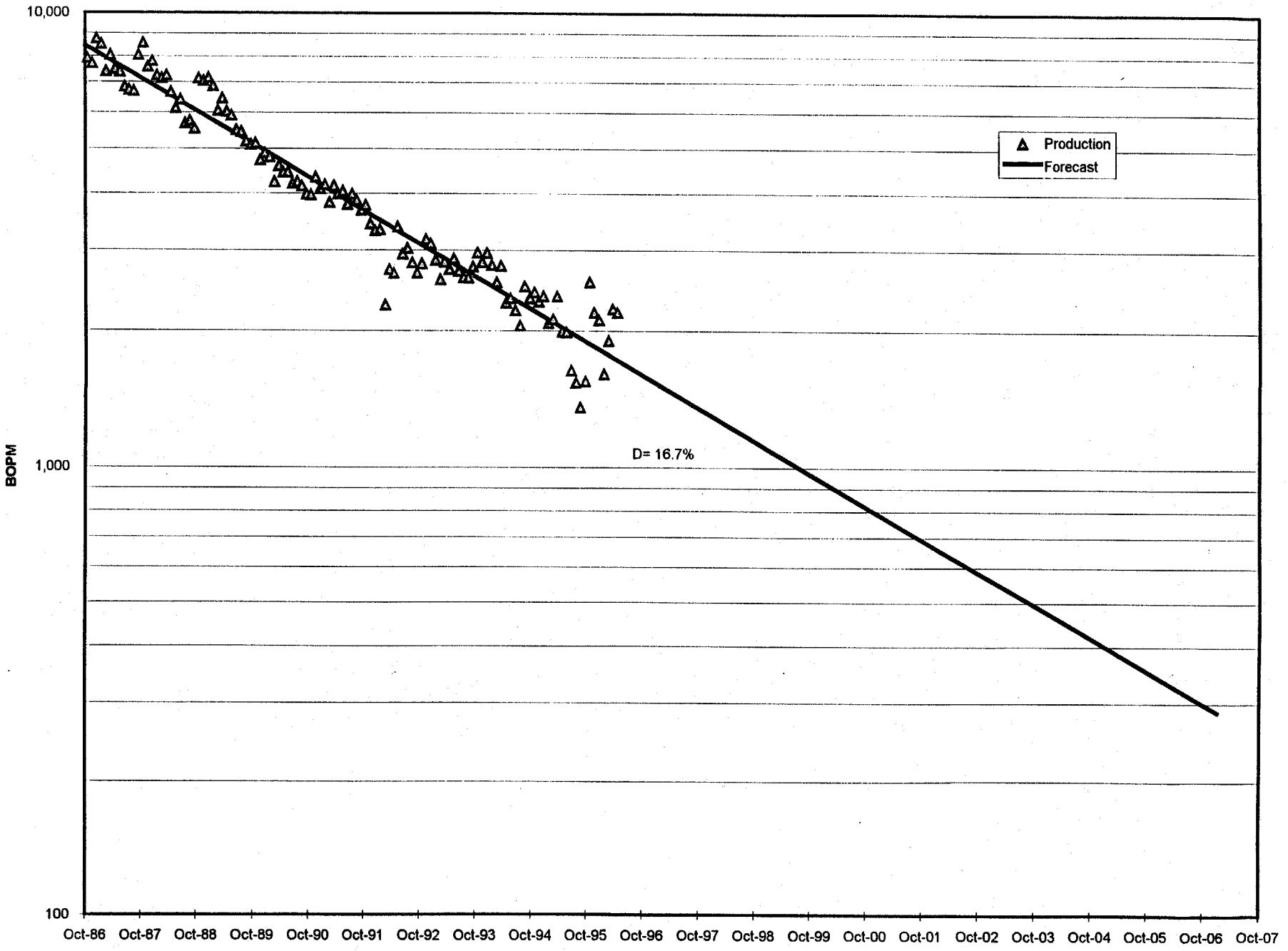
Mar-97
No Current Production

New Tensleep Wells



Other Tensleep Wells



APPENDIX D

DESCRIPTION OF FEDERAL BENEFITS EVALUATION MODEL

Federal Benefits Evaluation Model

Preliminary Discussion and Model Description

as of July 1, 1996

Under DOE Contract #DE-AC01-96FE64202

The Federal Benefits Evaluation Model is being constructed by Gustavson Associates Incorporated as part of the evaluation of the Naval Petroleum Reserve (NPR) -1, NPR -2, the Naval Oil Shale Reserves (NOSR) -1, NOSR-2, and NOSR-3. The following description is based upon the status of the model as of July 1, 1996. This description nor the model are complete at this time. Due to the ongoing work, there will be minor changes and additions to the description and model.

Formatting

Colors have been added in order to improve the ability to view the data in the spreadsheet. All column titles are displayed in bold with a blue-gray background. Income columns are shaded in light green and expense columns are in light red.

The year which corresponds to the numbers to the right beginning with the next fiscal year (October 1, 1996 through September 31, 1997) and the following 20 years. "Thereafter" is meant to be a place holder for values in excess of 22 years. The total is a place for the sum of all the years.

The description explains the origin of the numbers. The numbers are either copied from another location or calculated. Calculations performed in cells are shown in **bold** in the description. Locations are shown as FILE.WK4-Page:ColumnRow for example, INPUT.WK4-General:B4. For the model file's locations, the file name (MODEL.WK4) is not included.

Discussion

Page	Column-Rows	Title	Description of MODEL.WK4
Main	A1-13	Prices	These three buttons apply different pricing scenarios used to calculate gross revenue. To activate the macro, "push" the button. The model retrieves the specific array (from the Prices:E12-M56), copies it into Prices:B12-D56 and calculates the Property Pricing Factors (see description below). As the final function of this macro, the spreadsheet is calculated. The calculation alters the prices used on the individual cash flows (see description on prices under the Cash Flows page). The name of the price scenario used is then copied to Main:D2.
Main	B1-13	Property	These are five buttons whose names correspond to the five properties being evaluated. To evaluate a property, "push" the appropriate button. The activated macro retrieves product and expenditure forecasts from the appropriate page of the INPUT.WK4. In addition, the macro copies property-specific data to Main:D4-9 (see following description). As the final function of this macro, the spreadsheet is re-calculated. The name of the price scenario used is then copied to Main:D3.
Main	C1-D13	Current	These columns display the criteria used in the current evaluation. "Price" shows the pricing scenario chosen from the three options (see Prices description above.) "Property" shows the property chosen from the five options (see Property description above.) The value shown for the following six items (Working Int., Revenue Int., Bonus, Severance, Advalorem, and State Tax) are copied from the INPUT.WK4 by the macro when the property button is "pushed". Discussions on these input values can be found in the description on the INPUT.WK4. The following three items are entered here. "Fed. Tax Rate" is the federal tax rate, "MCF/bbl" is the conversion rate (usually on a BTU basis as per the IRS), and "Disc. Rate" is the annual percentage at which the future cash flows are discounted to the present value.
Main	E1-F13	Printing	These are five buttons used to simplify and standardize the printing of model results. To activate the print commands, "push" the button.
Main	B20	Initial Income	Copies the bonus number shown in Main:D6 which is copied from the Input when the property button is "pushed". This value may be either a lease bonus or sales price.

Page	Column-Rows	Title	Description of MODEL.WK4
Main	C20-42	Royalties	**= 50% * (1-Main:D5)*Tax Calculation:B*row#*; where *row#* = 5 to 27** The royalties are a function of the federal government's interest and the well head revenue. The federal government's interest in the properties is the difference between 100 percent and the leasee's interest. The leasee's Revenue Interest is obtained from Main:D5. The well head revenue is calculated on the BFIT page and is an array called Total Gross Revenue (see description below). In order to calculate royalties, only annual values are used. The federal government shares half of the royalties collected on federal lands with the state. As a result, the federal government's share of the royalties as shown here is 50 percent of the collected royalties.
Main	D20-42	Income Taxes	This array is copied from the Federal Income Tax array on the Tax Calculation page (see description below).
Main	E20-42	Total Annual Income	**= @Sum(Main:B*row#*...Main:D*row#*); where *row#* = 20 to 42.** The total of Initial Income, Royalties and Income Taxes by time period.
Main	F20-42	Cumulative	**= Main:E*row#* + Main:F{*row#*-1}; where *row#* = 20 to 42.** Current year's income plus cumulative income from prior year
Main	G20-42	Discounted @ xx %	For this column of numbers, the Total Annual Income is discounted to present worth based upon receiving income in the middle of the year. The discount rate, i.e., XX, is from Main:D12. The Initial Income is expected to be received at the first of the year; and as such, it is not discounted.
Main	H20-42	Cumulative Discounted	**= Main:G*row#* + Main:H{*row#*-1}; where *row#* = 20 to 42** Current year's discounted income plus cumulative discounted income from prior year.
Prices	A4-E6	Premium or Discount Factors	**Oil = INPUT.WK4-General:*column#*3/Prices:B12,** **Gas = INPUT.WK4-General:*column#*4/Prices:C12, and** **NGLs = INPUT.WK4-General:*column#*5/Prices:D12; where *column#* = B to F** The factor is the ratio of the first month's price (from INPUT.WK4) and the initial price from the price scenario (Prices:B12-D12). A factor is calculated for each property and product.

Page	Column-Rows	Title	Description of MODEL.WK4
Prices	B9-D56	Factors and Prices Used in This Run	The first three values are copied from the Premium or Discount Factors Table (Prices:A1-E6) for the chosen property (as shown in Main:D3). Below the factors, the monthly and annual product prices are shown before factors are applied. These values are copied from one of the pricing scenarios (shown on the right) when the scenario is chosen by "pushing" the appropriate button on the Main page.
Prices	E12-G56	EIA	These values are model inputs. Comments concerning the input number may be captured below the column of numbers (Prices:E56).
Prices	H12-J56	Inflation	These values are model inputs. Comments concerning the input number may be captured below the column of numbers (Prices:H56).
Prices	K12-M56	NPOSR	These values are model inputs. Comments concerning the input number may be captured below the column of numbers (Prices:K56).
Prices	N1-Z56	Charts	These six charts are a graphic representation of the three available pricing scenarios. The left hand charts (Prices:N1-R56) show the prices for the first 24 months. The right hand charts (Prices:S1-Z56) show the prices for the next 18 years. The price scenario that has been chosen for the evaluation is identified by black diamond symbols on the appropriate line.
Tax Calculations	B5-B27	Revenue	**= BFIT Summary:H*row#*; where *row#* = 18 in the first year, then 31 to 52.** Annual values from the before tax calculations are copied here. For the last 15 years and thereafter, a test is made to see if net revenue is greater than zero. If net revenue is zero, then a zero is entered in this location.
Tax Calculations	C5-C27	Roy., 80 % of CapEx, OpEx, OH, and Sev. Tax	**= BFIT Summary:I*row#* + 80% * BFIT Summary:J*row#* + BFIT Summary:K*row#* + BFIT Summary:L*row#* + BFIT Summary:M*row#*; where *row#* = 18 in the first year, then 31 to 52.** This column represents certain cash expenditures that are IRS allowed deductions to revenue. It includes royalties (Roy), 80 percent of capital expenditures (CapEx), operating expenditures (OpEx), allocated overhead costs (OH), and severance taxes (Sev. Tax). A discussion of these values is provided below in the descriptions on the BFIT Summary page. For the last 15 years and thereafter, a test is made to see if net revenue is greater than zero. If net revenue is zero, then a zero is entered in this location.

Page	Column-Rows	Title	Description of MODEL.WK4
Tax Calculations	D5-D27	Ad Valorem Tax	**= Main:D7 * (Tax Calculations:B*row#1*-BFIT Summary:I*row#2*); where *row#1* = 18 in the first year, then 31 to 52 and *row#2* = 5 to 27.** Advalorem taxes are paid in arrears based upon the previous year's revenue less royalties. These values are calculated by taking the previous year's revenue from column B on this page and subtracting the previous year's royalties as shown on the BFIT Summary page. Then the difference is multiplied by the advalorem tax rate as shown on the Main page. For the last 15 years and thereafter, a test is made to see if net revenue is greater than zero. If net revenue is zero, then a zero is entered in this location.
Tax Calculations	E5-E27	Depreciation	**= D and D:J*row#*; where *row#* = 5 to 27.** These values are copied from the depreciation and depletion page. Further discussion on depreciation is provided below in the D and D page description.
Tax Calculations	F5-F27	Depletion	**= @IF D and D:G*row#* > D and D:E*row#* then use D and D:G*row#* otherwise use D and D:E*row#*; where *row#* = 5 to 27.** The value obtained using cost depletion (D and D:G*row#*) is compared to percentage depletion (D and D:E*row#*). The greater of the two is used. The allowable deduction is 15 percent of gross revenue not to exceed net revenue. Owner can choose percentage or cost depletion <u>each</u> year. Further discussion on depletion is provided below in the D and D page description.
Tax Calculations	G5-G27	Total Deductions	**= Sum (Tax Calculations:C*row#* through Tax Calculations:F*row#*) ; where *row#* = 5 to 27.** The total amount of annual tax deductions shown on columns C through F are entered in this column.
Tax Calculations	H5-H27	State Taxable Income	**= Tax Calculations:B*row#* - Tax Calculations:G*row#* ; where *row#* = 5 to 27.** The taxable income is the difference between revenue and taxable deductions. This value is calculated on an annual basis and entered here. State income is a taxable deduction that is not included here. There is more discussion of state taxes the description on Prior Year State Income Taxes.

Page	Column-Rows	Title	Description of MODEL.WK4
Tax Calculations	I5-I27	State Income Taxes	**= Main:D9 * Tax Calculations:H*row#*; where *row#* = 5 to 27.** The state income tax liability is a function of the current year's federal tax liability prior to deductions for state income taxes. Assuming that accrual accounting is used, the state tax deduction to income for federal tax calculation is allowed in the same year that the state taxes are paid. To determine federal tax liability, the state tax is estimated by multiplying the year's State Taxable Income by the appropriate tax rate for the state. This tax rate is provided in the INPUT.WK4 file and shown on the Main page.
Tax Calculations	J5-J27	Federal Income Taxes	**= Main:D10 * (Tax Calculation:H*row#* - Tax Calculation:I*row#*); where *row#* = 5 to 27.** Federal income taxes allow the tax payer to deduct taxes paid to the state prior to determining the federal tax liability. Therefore, federal taxes are estimated by multiplying the federal tax rate by state taxable income less state taxes. Although the IRS has a graduated tax rate, the tax rate used in the model is fixed.
Tax Calculations	K5-K27	Net Cash Income	**= Tax Calculation:B*row#* - (Tax Calculation:C*row#* + Tax Calculation:D*row#* + (Main:D9 * Tax Calculation:H*row#* + Tax Calculation:J*row#*); where *row#* = 5 to 27** The net cash income is revenue less cash payments. Cash payments include royalties, expenses, overhead, and taxes.
Tax Calculations	L5-L27	Cumulative	**= K*row#* + L(*row#* -1); where *row#* = 5 to 27.** Current year's income plus cumulative from prior year
Tax Calculations	M5-M27	Discounted @ XX%	For this column of numbers, the Total Annual Income is discounted to present worth based upon receiving income in the middle of the year. The discount rate, i.e., XX, is from Main:D12. The Initial Income is expected to be received at the first of the year; and as such, it is not discounted.
Tax Calculations	N5-N27	Cumulative Discounted	**= M*row#* + N{*row#*-1}; where *row#* = 5 to 27.** Current year's discounted income plus cumulative discounted income from prior year.

Page	Column-Rows	Title	Description of MODEL.WK4
BFIT Sum	B6-D53	PRODUCTION Oil, Gas and NGLs	**= Cash Flows:*column#row#* + Cash Flows:*column#{row#+53}* + Cash Flows:*column#{row#+107}* + Cash Flows:*column#{row#+161}*; where *column#* = B to D and *row#* = 18 then 31 to 52.** This matrix of numbers are the four categories (PDP, PD-NP, PUD, and Unproven) totaled on an annual basis for each product (oil, gas, and NGLs). Detail on the source of these values can be found in the following description of the reserves category's pages.
BFIT Sum	E8-H55	REVENUE Oil, Gas, NGLs, and Total	**= Cash Flows:*column#row#* + Cash Flows:*column#{row#+53}* + Cash Flows:*column#{row#+107}* + Cash Flows:*column#{row#+161}*; where *column#* = H to K and *row#* = 18 then 31 through 52.** This matrix of numbers are the four categories (PDP, PD-NP, PUD, and Unproven) totaled on an annual basis for each product's revenue stream and the total revenue stream. Detail on the source of these values can be found in the following description of the reserves category's pages.
BFIT Sum	I8-N55	COSTS Royalty, CapEx, OpEx, OH, Sev. Taxes, and Total	**= Cash Flows:*column#row#* + Cash Flows:*column#{row#+53}* + Cash Flows:*column#{row#+107}* + Cash Flows:*column#{row#+161}*; where *column#* = L to Q and *row#* = 18 then 31 through 52.** This matrix of numbers are the four categories (PDP, PD-NP, PUD, and Unproven) totaled on an annual basis for each cost stream (royalty, capital expenses, operating expenses, overhead) and the total revenue stream. Detail on the source of these values can be found in the following description of the reserves category's pages.
BFIT Sum	O8-R55	FUTURE NET INCOME Net Revenue, Cumulative, Discounted, Cumulative Discounted	**= Cash Flows:*column#row#* + Cash Flows:*column#{row#+53}* + Cash Flows:*column#{row#+107}* + Cash Flows:*column#{row#+161}*; where *column#* = R to U and *row#* = 18 then 31 through 52.** This matrix of numbers are the four categories (PDP, PD-NP, PUD, and Unproven) totaled on an annual basis for each of the future net revenue streams. Detail on the source of these values can be found in the following description of the reserves category's pages.

Page	Column-Rows	Title	Description of MODEL.WK4
Cash Flows	B6-D53, B59-D106, B113-D160, B167-D214	PRODUCTION Oil, Gas and NGLs	This series of matrices are copied into this page when the appropriate property is chosen (see Main page, Property description). These numbers are originally input into INPUT.WK4.
Cash Flows	E6-G52, E59-G105, E113-G159, E167-G213	PRICES Oil, Gas and NGLs	**= Prices:*column#row#* * Prices:*column*#10; where *column#* = B to D and *row#* = 12 to 23, 23 to 35, and 36 to 56.** (The model uses monthly prices in the first two years. The break in rows is to allow for annual detail in other parts of the table.) This series of matrices are a result of multiplying the product's forecast monthly (or annual) price by the appropriate Premium/Discount factor. The resultant prices shown in this page are the expected regional prices. A zero price seen here indicates that no production of that particular product is expected and the Premium/Discount factor is equal to zero.
Cash Flows	H6-J53, H59-J106, H113-J160, H167-J214	REVENUE Oil, Gas, NGLs	**= Cash Flows:B*row#* * Cash Flows:E*row#* for oil, Cash Flows:B*row#* * Cash Flows:E*row#* for gas, and Cash Flows:B*row#* * Cash Flows:E*row#* for NGLs; where *row#* = 6 to 52 for PDP, 59 to 105 for PD-NP, 113 to 159 for PUD, and 167 to 213 for Unproven.** To determine the revenue by product, the product's volume is multiplied by it's price for each time period. For the first two years, the annual values are calculated by adding the prior twelve months of revenue (=@Sum(Oct. through Sept. revenues). Likewise, the total for all time periods is calculated by adding together the annual
Cash Flows	K6-K53, K59-K106, K113-K160, K167-K214	REVENUE Total	**= Cash Flows:H*row#* + Cash Flows:I*row#* + Cash Flows:J*row#*; where *row#* = 6 to 53 for PDP, 59 to 106 for PD-NP, 113 to 160 for PUD, and 167 to 214 for Unproven.** The revenues for each of the products in each time period are added together to calculate the potential total revenues for each time period.
Cash Flows	I5-I53, I58-I106, I112-I160, I166-I214	COSTS Royalty @ xx %	**= Main:D5 * Cash Flows:K*row#*; where *row#* = 6 to 53 for PDP, 59 to 106 for PD-NP, 113 to 160 for PUD, and 167 to 214 for Unproven.** (The percent value that precedes the row of forecast royalties is copied from Main:D5.) The revenue for each period is multiplied by the royalty interest to determine the future royalties.

Page	Column-Rows	Title	Description of MODEL.WK4
Cash Flows	M6-O53, M59-O106, M113-O160, M167-O214	COSTS CapEx, OpEx, OH,	This series of matrices are copied into this page when the appropriate property is chosen (see Main page, Property description). These numbers are originally input into the INPUT.WK4 file.
Cash Flows	P6-P53, P59-P106, P113-P160, P167-P214	COSTS Sev. Taxes	**= Main:D7 * Cash Flows:K*row#*; where *row#* = 6 to 53 for PDP, 59 to 106 for PD-NP, 113 to 160 for PUD, and 167 to 214 for Unproven.** (The number that precedes the severance tax row is copied from Main:D7.) The revenue for each period is multiplied by the severance tax factor to determine the future severance taxes.
Cash Flows	Q6-Q53, Q59-Q106, Q113-Q160, Q167-Q214	COSTS Total	**= @Sum(Cash Flows:L*row#*...Cash Flows:P*row#*); where *row#* = 6 to 53 for PDP, 59 to 106 for PD-NP, 113 to 160 for PUD, and 167 to 214 for Unproven.** The costs for each time period are added together to calculate the potential total cost for each time period.
Cash Flows	R6-R53, R59-R106, R113-R160, R167-R214	FUTURE NET INCOME Net Revenue	**Until Fiscal Year 2004 = Cash Flows:K*row#* - Cash Flows:Q*row#*; where *row#* = 6 to 36 for PDP, 59 to 89 for PD-NP, 113 to 143 for PUD, and 167 to 197 for Unproven.** **After Fiscal Year 2004 = @IF Cash Flows:K*row#* - Cash Flows:Q*row#* < 0 or Cash Flows:R{*row#*-1} = 0, then = 0, otherwise = Cash Flows:K*row#* - Cash Flows:Q*row#*; where *row#* = 37 to 53 for PDP, 90 to 106 for PD-NP, 144 to 160 for PUD, and 198 to 214 for Unproven.** The net revenue are the total revenues from production of all the products less the total costs associated with that production. Net revenue is calculated using this formula for each time period. Net revenue is allowed to be less than zero in the first seven years due to capital expenditures presumably to develop the field. After the seventh year, if the net revenues are less than zero in any year, the project is assumed to be uneconomical from that point forward and future cash flow is set to zero.
Cash Flows	S6-S52, S59-S105, S113-S159, S167-S213	FUTURE NET INCOME Cumulative	**= Main:R*row#* + Main:S{*row#*-1}; where *row#* = 6 to 52 for PDP, 59 to 105 for PD-NP, 113 to 159 for PUD, and 167 to 213 for Unproven.** (Annual values for Fiscal Year 1997 and Fiscal Year 1998 are shown in the Sep-97 and Sep-98 time period.) Current time period's net revenue plus cumulative net revenue from prior time period.

Page	Column-Rows	Title	Description of MODEL.WK4
Cash Flows	T6-T53, T59-T106, T113-T160, T167-T214	FUTURE NET INCOME Discounted	For this column of numbers, the Future Net Revenue is discounted to present worth based upon receiving income in the middle of the time period. The annual discount rate, i.e., XX, is from Main:D12.
Cash Flows	U6-U52, U59-U105, U113-U159, U167-U213	FUTURE NET INCOME Cumulative Discounted	**= Cash Flows:T*row#* + Cash Flows:U{*row#*-1}; where *row#* = 6 to 52 for PDP, 59 to 105 for PD-NP, 113 to 159 for PUD, and 167 to 213 for Unproven.** (Annual values for FY97 and FY98 are shown in the Sep-97 and Sep-98 time period.) Current time period's discounted net revenue plus cumulative discounted net revenue from time period.
D and D	B4 - B26	Revenue	**= Tax Calculation:B*row#*; where *row#* = 5 to 27.** This copies the annual revenue values from the tax calculation page.
D and D	C4 - C26	Maximum % Depletion	**= 15% * B *row#*; where *row#* = 4 to 26.** Percent depletion is no greater than 15 percent of total revenue. Purchased proved reserves are assumed eligible for percentage depletion because the former owner (i.e., DOE) did not use percentage depletion in the past.
D and D	D4 - D26	Taxable Income w/o Depletion	**= Tax Calculation:B*row#* - @SUM(Tax Calculation:C*row#*...Tax Calculation:E*row#*); where *row#* = 5 to 27.** The amount of percentage depletion that an operator is allowed to take is limited by the taxable income. The percentage depletion amount cannot exceed taxable income before depletion. Taxable income before depletion is equal to the total revenue less applicable deductions (royalty, 80% of capital expenditures, operating expenses, allocated overhead, severance and ad Valorem taxes, and depreciation).

Page	Column-Rows	Title	Description of MODEL.WK4
D and D	E4 - E26	Allowable % Depletion	**= @IF(D*row#* < 0), then = 0, otherwise, @IF(C*row#* < D*row#*), then = C*row#*, otherwise = D5; where *row#* = 5 to 27.** The allowable depletion is a function of the taxable income before depletion (TIBD). The first test is to ensure that TIBD is positive, if not then percentage depletion is not allowed. The second test is to determine the lessor of calculated percentage depletion or TIBD. Percentage depletion is not allowed for royalty interest owners who receive more than 1,000 bopd (gas is converted to oil on a 6 MCF/bbl basis).
D and D	F4 - F26	Cost Depletion %	**@IF (@SUM(Cash Flows:B53...Cash Flows:D53) > 0, then (Cash Flows:B*row#* + Cash Flows:C*row#* / Main:D10 + Cash Flows:D*row#* / 42) / (Cash Flows:B53 + Cash Flows:C53 / Main:D10 + Cash Flows:D53 / 42), otherwise = 0) ; where *row#* = 18 then 31 to 52.** Cost depletion allows a reduction in taxable income to the extent that purchased PDP reserves are depleted. This is a calculation to determine what percentage of the PDP reserves are produced in each future year. First, a test is made to determine if there are proved developed producing reserves. If there are, then the reserves produced in a given year is divided by the total reserves to generate a percentage produced in that year. If there are no PDP reserves, the model enters a zero. The total at the bottom of the column should show 100 percent.
D and D	C4 - C26	Cost Depletion	**= Main:D6 * F*row#*; where *row#* = 5 to 27.** The fraction of reserves produced in a time period is multiplied by the initial investment. The total at the bottom of the column should equal the initial investment.
D and D		Tangible Capital	**= 20% * BFIT Calculations:J*row#;* where *row#* = 18 then 31 to 52.** The tangible capital is calculated as 20 percent of the total capital expense as shown on the BFIT Calculations page.
D and D		Depreciation Factors	These factors are hard inputs based upon using a seven year life for capital expenditures, mid-year installation, and using double declining balance depreciation for the first 3.5 years then switching over to straight line decline for the final 3.5 years.

Page	Column-Rows	Title	Description of MODEL.WK4
D and D		Capital Depreciation	= **TBD** The capital depreciation for capital spent in year one is the appropriate annual depreciation factor times the capital expenditure beginning in year one and continuing for the next seven years. In the second year, the first year's depreciation is added to the depreciation for the second year and so on for each year.
Macros	B1	Load NPR-2 Data and Calculate	TBD
Macros	C1	Load NPR-3 Data and Calculate	TBD
Macros	D1	Load NOSR-1 Data and Calculate	TBD
Macros	E1	Load NOSR-2 Data and Calculate	TBD
Macros	F1	Load NOSR-3 Data and Calculate	TBD
Macros	G1	Print Cash Flows Individually	TBD
Macros	H1	Print BFIT Sum	TBD
Macros	I1	Print FIT Calculations	TBD
Macros	J1	Print Main page	TBD

Data Used in the current evaluati

Price=INFL
Property=NPR-3
Royalty=12.50%
Bonus=500,000
Severance=5.00%
Advalorem =7.00%
St. Tax Rate=5.00%
Fed Tax Rate= 35%
Mcf/bbl=6
Disc. Rate=10.00%

Federal Government Benefits

	Initial Income $	Royalties $	Federal Income Taxes $	Total Annual Federal Income $	Cumulative $000	Discounted @ 10%	Cumulative Discounted $000
FY-97	500,000	10,671,642	(992,365)	10,179,277	10,179	9,728,829	9,729
FY-98		5,059,235	(782,888)	4,276,347	14,456	3,706,670	13,435
FY-99		2,315,231	(1,351,342)	963,890	15,420	759,531	14,195
FY-00		1,878,306	(1,034,077)	844,228	16,264	604,763	14,800
FY-1		1,534,818	(907,404)	627,414	16,891	408,589	15,208
FY-2		1,269,442	(796,958)	472,483	17,364	279,722	15,488
FY-3		1,002,509	(715,490)	287,019	17,651	154,475	15,643
FY-4		830,146	(613,800)	216,345	17,867	105,853	15,748
FY-5		724,267	(511,216)	213,050	18,080	94,764	15,843
FY-6		4,355,260	457,794	4,813,053	22,893	1,946,212	17,789
FY-7		4,337,607	980,807	5,318,414	28,212	1,955,055	19,744
FY-8		334,249	48,287	382,536	28,594	127,837	19,872
FY-9		0	0	0	28,594	0	19,872
FY-10		0	0	0	28,594	0	19,872
FY-11		0	0	0	28,594	0	19,872
FY-12		0	0	0	28,594	0	19,872
FY-13		0	0	0	28,594	0	19,872
FY-14		0	0	0	28,594	0	19,872
FY-15		0	0	0	28,594	0	19,872
FY-16		0	0	0	28,594	0	19,872
FY-17		0	0	0	28,594	0	19,872
FY-18		0	0	0	28,594	0	19,872
Thereafter		0	0	0	28,594	0	19,872
TOTAL	500,000	34,312,711	(6,218,653)	28,594,058		19,872,301	

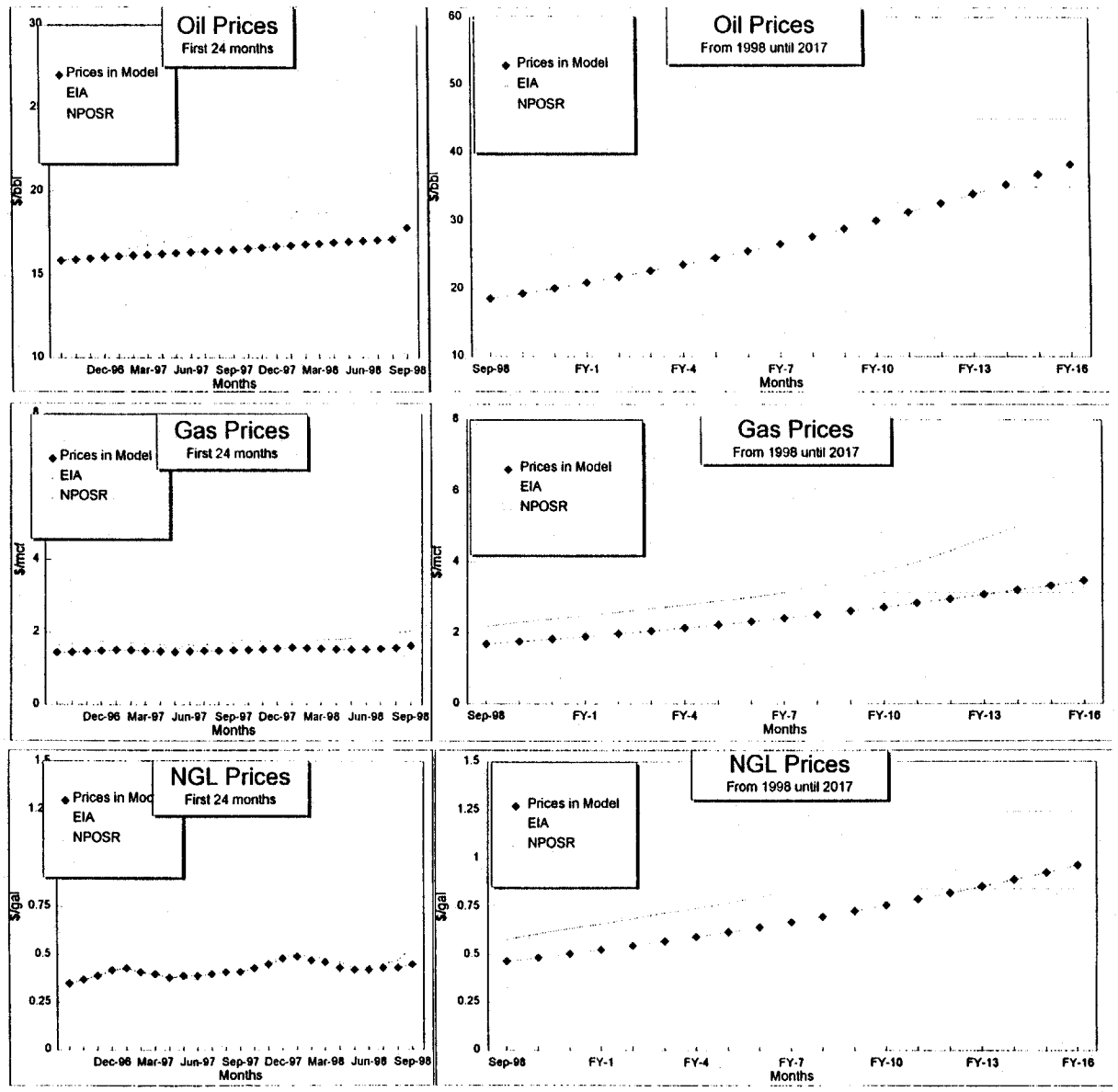
PRICING DETAIL

Regional Premium/Discount Factors					
NPR-2	NPR-3	NOSR-1	NOSR-2	NOSR-3	
0.91	1.13	0.00	0.00	0.00	Oil prices in $/bbl
1.00	1.09	0.69	0.69	0.69	Gas prices in $/Mcf
1.00	1.00	1.00	1.00	1.00	NGL prices in $/gal

NPR-3

Factors and Prices Used in This Run

	113.4% Oil	109.0% Gas	100.0% NGLs	EIA Oil	EIA Gas	EIA NGLs	Inflation Oil	Inflation Gas	Inflation NGLs	NPOSR Oil	NPOSR Gas	NPOSR NGLs
Oct-96	$15.87	$1.44	$0.35	$17.33	$1.65	$0.35	$15.87	$1.44	$0.35	$15.87	$1.44	$0.35
Nov-96	$15.92	$1.45	$0.37	$17.38	$1.69	$0.37	$15.92	$1.45	$0.37	$16.03	$1.46	$0.37
Dec-96	$15.98	$1.47	$0.39	$17.44	$1.72	$0.39	$15.98	$1.47	$0.39	$16.19	$1.47	$0.39
Jan-97	$16.05	$1.49	$0.42	$17.50	$1.75	$0.42	$16.05	$1.49	$0.42	$16.34	$1.49	$0.42
Feb-97	$16.11	$1.51	$0.43	$17.56	$1.74	$0.43	$16.11	$1.51	$0.43	$16.50	$1.51	$0.43
Mar-97	$16.16	$1.50	$0.41	$17.62	$1.72	$0.41	$16.16	$1.50	$0.41	$16.66	$1.50	$0.41
Apr-97	$16.21	$1.48	$0.40	$17.68	$1.69	$0.40	$16.21	$1.48	$0.40	$16.82	$1.53	$0.40
May-97	$16.26	$1.47	$0.38	$17.74	$1.66	$0.38	$16.26	$1.47	$0.38	$16.98	$1.56	$0.38
Jun-97	$16.31	$1.45	$0.39	$17.80	$1.65	$0.38	$16.31	$1.45	$0.39	$17.13	$1.59	$0.39
Jul-97	$16.36	$1.47	$0.39	$17.86	$1.66	$0.37	$16.36	$1.47	$0.39	$17.29	$1.62	$0.39
Aug-97	$16.41	$1.49	$0.40	$17.92	$1.67	$0.37	$16.41	$1.49	$0.40	$17.45	$1.65	$0.40
Sep-97	$16.46	$1.49	$0.41	$17.98	$1.76	$0.38	$16.46	$1.49	$0.41	$17.61	$1.68	$0.41
Oct-97	$16.52	$1.50	$0.41	$18.05	$1.77	$0.38	$16.52	$1.50	$0.41	$17.77	$1.71	$0.42
Nov-97	$16.58	$1.51	$0.43	$18.16	$1.80	$0.44	$16.58	$1.51	$0.43	$17.92	$1.74	$0.44
Dec-97	$16.65	$1.53	$0.45	$18.25	$1.83	$0.46	$16.65	$1.53	$0.45	$18.08	$1.77	$0.46
Jan-98	$16.71	$1.55	$0.48	$18.36	$1.86	$0.49	$16.71	$1.55	$0.48	$18.24	$1.82	$0.49
Feb-98	$16.77	$1.57	$0.49	$18.47	$1.85	$0.50	$16.77	$1.57	$0.49	$18.40	$1.80	$0.50
Mar-98	$16.83	$1.56	$0.47	$18.56	$1.83	$0.49	$16.83	$1.56	$0.47	$18.56	$1.78	$0.49
Apr-98	$16.89	$1.54	$0.46	$18.67	$1.82	$0.48	$16.89	$1.54	$0.46	$18.71	$1.78	$0.48
May-98	$16.95	$1.53	$0.43	$18.78	$1.80	$0.46	$16.95	$1.53	$0.43	$18.87	$1.81	$0.46
Jun-98	$17.00	$1.52	$0.42	$18.87	$1.83	$0.43	$17.00	$1.52	$0.42	$19.03	$1.83	$0.43
Jul-98	$17.05	$1.53	$0.42	$18.94	$1.85	$0.44	$17.05	$1.53	$0.42	$19.19	$1.85	$0.44
Aug-98	$17.10	$1.54	$0.43	$18.99	$1.88	$0.45	$17.10	$1.54	$0.43	$19.35	$1.95	$0.45
Sep-98	$17.15	$1.56	$0.43	$19.04	$1.90	$0.47	$17.15	$1.56	$0.43	$19.52	$2.00	$0.47
FY-99	$17.85	$1.62	$0.45	$20.30	$2.05	$0.54	$17.85	$1.62	$0.45	$20.95	$2.05	$0.54
FY-00	$18.59	$1.69	$0.47	$21.66	$2.19	$0.58	$18.59	$1.69	$0.47	$22.32	$2.19	$0.58
FY-1	$19.35	$1.76	$0.49	$23.11	$2.31	$0.61	$19.35	$1.76	$0.49	$23.76	$2.31	$0.61
FY-2	$20.14	$1.83	$0.50	$24.63	$2.40	$0.64	$20.14	$1.83	$0.50	$25.32	$2.40	$0.64
FY-3	$20.97	$1.91	$0.53	$26.11	$2.50	$0.66	$20.97	$1.91	$0.53	$26.81	$2.50	$0.66
FY-4	$21.83	$1.99	$0.55	$27.56	$2.59	$0.69	$21.83	$1.99	$0.55	$28.29	$2.59	$0.69
FY-5	$22.72	$2.07	$0.57	$29.02	$2.70	$0.72	$22.72	$2.07	$0.57	$29.76	$2.70	$0.72
FY-6	$23.65	$2.15	$0.59	$30.54	$2.79	$0.74	$23.65	$2.15	$0.59	$31.31	$2.80	$0.74
FY-7	$24.62	$2.24	$0.62	$32.05	$2.91	$0.77	$24.62	$2.24	$0.62	$32.84	$2.91	$0.77
FY-8	$25.63	$2.33	$0.64	$33.55	$3.02	$0.80	$25.63	$2.33	$0.64	$34.36	$3.01	$0.80
FY-9	$26.68	$2.43	$0.67	$35.14	$3.16	$0.84	$26.68	$2.43	$0.67	$35.00	$3.15	$0.84
FY-10	$27.78	$2.53	$0.70	$36.79	$3.32	$0.88	$27.78	$2.53	$0.70	$35.00	$3.15	$0.84
FY-11	$28.92	$2.63	$0.72	$38.51	$3.52	$0.93	$28.92	$2.63	$0.72	$35.00	$3.15	$0.84
FY-12	$30.10	$2.74	$0.75	$40.34	$3.75	$1.00	$30.10	$2.74	$0.75	$35.00	$3.15	$0.84
FY-13	$31.33	$2.85	$0.79	$42.25	$4.01	$1.06	$31.33	$2.85	$0.79	$35.00	$3.15	$0.84
FY-14	$32.62	$2.97	$0.82	$44.17	$4.32	$1.15	$32.62	$2.97	$0.82	$35.00	$3.15	$0.84
FY-15	$33.96	$3.09	$0.85	$45.00	$4.68	$1.24	$33.96	$3.09	$0.85	$35.00	$3.15	$0.84
FY-16	$35.35	$3.22	$0.89	$45.00	$5.00	$1.24	$35.35	$3.22	$0.89	$35.00	$3.15	$0.84
FY-17	$36.80	$3.35	$0.92	$45.00	$5.00	$1.24	$36.80	$3.35	$0.92	$35.00	$3.15	$0.84
FY-18	$38.31	$3.49	$0.96	$45.00	$5.00	$1.24	$38.31	$3.49	$0.96	$35.00	$3.15	$0.84
Thereafter	$40.00	$4.00	$1.00	$45.00	$5.00	$1.24	$40.00	$4.00	$1.00	$35.00	$3.15	$0.84
				EIA Annual Energy Outlook 1996			Inflation @ 4.1%			EIA + refining margin + billing mods + cap in 2008		


Oil Prices
First 24 months
Prices in Model
EIA
NPOSR
$/bbl
Months
Oil Prices
From 1998 until 2017
Gas Prices
First 24 months
$/mcf
Gas Prices
From 1998 until 2017
NGL Prices
First 24 months
$/gal
NGL Prices
From 1998 until 2017
Dec-96 Mar-97 Jun-97 Sep-97 Dec-97 Mar-98 Jun-98 Sep-98
Sep-98 FY-1 FY-4 FY-7 FY-10 FY-13 FY-16

Federal Income Tax Calculations

NPR-3

	Revenue	Royalty, 80% Cap, OpEx, OH, and Sev. Tax	Ad Valorem Taxes	Depreciation	Depletion	Total Deductions	Taxable Income	State Income Taxes	Federal Income Taxes	Income Net of Taxes	Cumulative	Discounted @ 10%	Cumulative Discounted
	$	$	$	$	$	$	$	$	$	$	$000		$000
FY-97	12,198,163	13,884,491	747,015	143,258	405,956	15,180,720	(2,984,557)	(149,228)	(992,365)	(230,594)	(231)	(230,594)	(231)
FY-98	5,781,983	7,437,156	354,146	251,185	94,044	8,136,533	(2,354,550)	(117,727)	(782,888)	(71,010)	(302)	(61,551)	(292)
FY-99	2,645,979	6,363,080	162,066	185,018	0	6,710,164	(4,064,185)	(203,209)	(1,351,342)	(1,831,803)	(2,133)	(1,443,434)	(1,736)
FY-00	2,146,635	4,993,005	131,481	132,156	0	5,256,642	(3,110,007)	(155,500)	(1,034,077)	(1,388,463)	(3,522)	(994,626)	(2,730)
FY-1	1,754,078	4,281,279	107,437	94,397	0	4,483,113	(2,729,035)	(136,452)	(907,404)	(1,264,085)	(4,786)	(823,207)	(3,553)
FY-2	1,450,791	3,665,799	88,861	92,998	0	3,847,658	(2,396,867)	(119,843)	(796,958)	(1,116,858)	(5,903)	(661,208)	(4,215)
FY-3	1,145,724	3,134,400	70,176	92,998	0	3,297,574	(2,151,849)	(107,592)	(715,490)	(1,022,378)	(6,925)	(550,249)	(4,765)
FY-4	948,738	2,688,396	58,110	48,248	0	2,794,754	(1,846,016)	(92,301)	(613,800)	(914,965)	(7,840)	(447,671)	(5,213)
FY-5	827,733	2,312,777	50,699	1,749	0	2,365,225	(1,537,492)	(76,875)	(511,216)	(793,487)	(8,634)	(352,941)	(5,565)
FY-6	4,977,439	2,549,132	304,868	0	746,616	3,600,616	1,376,823	68,841	457,794	2,523,853	(6,110)	1,020,548	(4,545)
FY-7	4,957,265	960,246	303,632	0	743,590	2,007,468	2,949,797	147,490	980,807	3,488,380	(2,621)	1,282,332	(3,263)
FY-8	381,999	156,078	23,397	0	57,300	236,776	145,223	7,261	48,287	218,123	(2,403)	72,893	(3,190)
FY-9	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-10	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-11	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-12	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-13	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-14	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-15	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-16	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-17	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
FY-18	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
Thereafter	0	0	0	0	0	0	0	0	0	0	(2,403)	0	(3,190)
TOTAL	39,214,527	52,425,839	2,401,890	1,042,007	2,047,506	57,917,242	(18,702,715)	(935,136)	(6,218,653)	(2,403,287)		(3,189,707)	

Discount Factor	BFIT	After Federal and State Income Taxes
5%	(10.002)	
10%	(9.958)	
15%	(8.595)	
20%	(7.974)	
25%	(7.375)	
30%	(6.825)	
35%	(6.330)	

NPR-3	PRODUCTION			REVENUE				COSTS						Future Net Income			
	Oil	Gas	NGLS	Oil	Gas	NGLS	Total	Royalty @	CapEX	OpEX	OH	Sev. Taxes	Total	Net Revenue	Cumulative	Discounted @	Cumulative Discounted
	bbls	mcf	gals	$	$	$	$	12.50%	$	$		5.00%	$	$	$000	10%	$000
Oct-96	43,618	0	169,872	785,116	0	59,455	844,570	105,571	917,836	606,250	0	5,279	1,529,385	(790,366)	(790)	(790,366)	(790)
Nov-96	44,290	0	169,872	796,723	0	62,853	862,575	107,822	417,836	660,570	0	5,391	1,083,797	(221,222)	(1,012)	(219,393)	(1,010)
Dec-96	45,680	0	169,872	827,930	0	66,250	894,180	111,773	417,836	660,570	0	5,589	1,083,995	(189,814)	(1,201)	(186,690)	(1,196)
Jan-97	46,520	0	169,872	846,848	0	71,346	918,195	114,774	417,836	660,570	0	5,739	1,084,145	(165,950)	(1,367)	(161,869)	(1,358)
Feb-97	50,372	0	169,872	920,399	0	73,045	993,444	124,180	417,836	660,570	0	6,209	1,084,615	(91,171)	(1,459)	(88,194)	(1,447)
Mar-97	52,283	0	169,872	958,282	0	69,848	1,027,929	128,491	417,836	660,570	0	6,425	1,084,831	(56,901)	(1,515)	(54,588)	(1,501)
Apr-97	52,837	0	169,872	971,433	0	67,949	1,039,381	129,923	417,836	660,570	0	6,496	1,084,902	(45,521)	(1,561)	(43,310)	(1,544)
May-97	54,428	0	169,872	1,003,771	0	64,551	1,068,322	133,540	417,836	660,570	0	6,677	1,085,083	(16,761)	(1,578)	(15,815)	(1,560)
Jun-97	55,630	0	169,872	1,029,093	0	66,250	1,095,343	136,918	417,836	660,570	0	6,846	1,085,252	10,091	(1,568)	9,443	(1,551)
Jul-97	57,667	0	169,872	1,070,046	0	66,250	1,136,296	142,037	417,836	660,570	0	7,102	1,085,508	50,788	(1,517)	47,133	(1,504)
Aug-97	58,114	0	169,872	1,081,636	0	67,949	1,149,585	143,698	417,836	660,570	0	7,185	1,085,591	63,994	(1,453)	58,898	(1,445)
Sep-97	58,744	0	169,872	1,096,693	0	69,648	1,166,341	145,793	417,836	660,570	0	7,290	1,085,696	80,645	(1,372)	73,610	(1,371)
FY-97	620,177	0	2,038,466	11,390,969	0	805,194	12,196,163	1,524,520	5,514,036	7,872,516	0	76,226	13,462,778	(1,372,187)		(1,371,142)	
Oct-97	27,820	0	45,106	522,376	0	18,493	540,870	67,609	196,000	581,471	0	3,380	780,851	(239,982)	(1,612)	(217,235)	(1,588)
Nov-97	26,325	0	42,692	496,269	0	18,358	514,627	64,328	0	540,000	0	3,216	543,216	(28,590)	(1,641)	(25,666)	(1,614)
Dec-97	26,598	0	43,150	503,359	0	19,417	522,776	65,347	0	540,000	0	3,267	543,267	(20,491)	(1,661)	(18,244)	(1,632)
Jan-98	26,019	0	42,232	494,160	0	20,271	514,432	64,304	0	540,000	0	3,215	543,215	(28,784)	(1,690)	(25,415)	(1,658)
Feb-98	22,983	0	37,305	436,063	0	18,280	456,343	57,043	0	540,000	0	2,852	542,852	(86,509)	(1,777)	(75,752)	(1,733)
Mar-98	24,881	0	40,409	475,931	0	18,992	494,923	61,865	0	540,000	0	3,093	543,093	(48,170)	(1,825)	(41,832)	(1,775)
Apr-98	23,556	0	38,276	452,194	0	17,607	469,801	58,725	0	540,000	0	2,936	542,936	(73,135)	(1,898)	(62,987)	(1,838)
May-98	23,817	0	38,683	458,676	0	16,634	475,309	59,414	0	540,000	0	2,971	542,971	(67,661)	(1,966)	(57,791)	(1,896)
Jun-98	22,551	0	36,652	435,566	0	15,394	450,960	56,370	0	540,000	0	2,818	542,818	(91,859)	(2,057)	(77,810)	(1,974)
Jul-98	22,797	0	37,065	441,610	0	15,567	457,177	57,147	0	540,000	0	2,857	542,857	(85,680)	(2,143)	(71,977)	(2,046)
Aug-98	22,311	0	36,280	433,451	0	15,600	449,051	56,131	0	540,000	0	2,807	542,807	(93,755)	(2,237)	(78,110)	(2,124)
Sep-98	21,135	0	34,385	420,928	0	14,786	435,714	54,464	0	540,000	0	2,723	542,723	(107,009)	(2,344)	(88,415)	(2,212)
FY-98	290,792	0	472,235	5,572,584	0	209,399	5,781,983	722,748	196,000	6,521,471	0	36,137	6,753,608	(971,625)		(841,233)	
FY-99	130,670	0	0	2,645,979	0	0	2,645,979	330,747	0	6,015,795	0	16,537	6,032,332	(3,386,354)	(5,730)	(2,668,398)	(4,881)
FY-00	101,835	0	0	2,146,635	0	0	2,146,635	268,329	0	4,711,259	0	13,416	4,724,675	(2,578,040)	(8,308)	(1,846,781)	(6,728)
FY-1	79,935	0	0	1,754,078	0	0	1,754,078	219,260	0	4,051,058	0	10,963	4,062,019	(2,307,941)	(10,616)	(1,502,995)	(8,231)
FY-2	63,510	0	0	1,450,791	0	0	1,450,791	181,349	0	3,475,383	0	9,067	3,484,450	(2,033,660)	(12,650)	(1,203,978)	(9,435)
FY-3	48,180	0	0	1,145,724	0	0	1,145,724	143,216	0	2,984,024	0	7,161	2,991,185	(1,845,460)	(14,495)	(993,236)	(10,428)
FY-4	38,325	0	0	948,736	0	0	948,736	118,592	0	2,583,874	0	5,930	2,589,804	(1,621,068)	(16,116)	(793,150)	(11,221)
FY-5	32,120	0	0	827,733	0	0	827,733	103,467	0	2,204,137	0	5,173	2,209,310	(1,381,577)	(17,498)	(614,522)	(11,835)
FY-6	25,915	1,825,000	0	695,211	4,282,228	0	4,977,439	622,180	0	1,895,843	0	31,109	1,926,952	3,050,487	(14,447)	1,233,499	(10,602)
FY-7	17,885	1,825,000	0	499,465	4,457,800	0	4,957,265	619,658	0	309,605	0	30,983	340,588	4,616,677	(9,831)	1,697,096	(8,905)
FY-8	13,140	0	0	381,999	0	0	381,999	47,750	0	105,941	0	2,387	108,328	273,671	(9,557)	91,456	(8,813)
FY-9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
FY-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
Thereafter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(9,557)	0	(8,813)
TOTAL	1,462,484	3,650,000	2,510,701	29,459,905	8,740,028	1,014,593	39,214,527	4,901,816	5,210,036	42,710,904	0	245,091	48,271,602	(9,557,075)		(8,313,385)	

PDP

Proved Developed Producing

NPR-3	PRODUCTION			PRICES			GROSS REVENUE				COSTS						Future Net Income			
	Oil	Gas	NGLs	Oil	Gas	NGLs	Oil	Gas	NGLs	Total	Royalty @	CapEx	OpEx	Oil	Sev. Taxes	Total	Net Revenue	Cumulative	Discounted @	Cumulative Discounted
	bbls	mcf	gals	$	$	$	$	$	$	$	12.50%	$	$	$	5.00%	$	$	$000	10%	$000
Oct-96	43,818		169,872	$18.00	$1.57	$0.35	785,115	0	59,455	844,570	105,571		606,250		5,279	$717,100	$127,470	$127	$127,470	$127
Nov-96	43,818		169,872	$18.06	$1.58	$0.37	787,588	0	62,853	850,441	106,305		606,250		6,315	$811,565	$238,876	$366	$236,902	$364
Dec-96	43,818		169,872	$18.12	$1.60	$0.39	790,557	0	66,250	856,807	107,101		606,250		5,355	$811,605	$245,202	$612	$241,166	$606
Jan-97	43,818		169,872	$18.20	$1.62	$0.42	794,020	0	71,346	865,366	108,171		606,250		5,409	$811,659	$253,708	$865	$247,469	$853
Feb-97	43,818		169,872	$18.27	$1.65	$0.43	796,988	0	73,045	870,033	108,754		606,250		5,438	$811,688	$258,346	$1,124	$249,910	$1,103
Mar-97	43,818		169,872	$18.33	$1.64	$0.41	799,462	0	69,648	869,109	108,639		606,250		5,432	$811,682	$257,427	$1,381	$246,964	$1,350
Apr-97	43,818		169,872	$18.39	$1.61	$0.40	801,935	0	67,949	869,884	108,736		606,250		5,437	$811,687	$258,197	$1,639	$245,656	$1,596
May-97	43,818		169,872	$18.44	$1.60	$0.38	804,409	0	64,551	868,960	108,620		606,250		5,431	$811,681	$257,279	$1,897	$242,759	$1,838
Jun-97	43,818		169,872	$18.50	$1.58	$0.39	806,883	0	66,250	873,133	109,142		606,250		5,457	$811,707	$261,426	$2,158	$244,633	$2,083
Jul-97	43,818		169,872	$18.56	$1.60	$0.39	809,356	0	66,250	875,606	109,451		606,250		5,473	$811,723	$263,884	$2,422	$244,892	$2,328
Aug-97	43,818		169,872	$18.61	$1.62	$0.40	811,830	0	67,949	879,779	109,972		606,250		5,499	$811,749	$268,030	$2,690	$246,685	$2,575
Sep-97	43,818		169,872	$18.67	$1.62	$0.41	814,303	0	69,648	883,951	110,494		606,250		5,526	$811,775	$272,176	$2,962	$248,430	$2,823
FY-97	523,410	0	2,038,464				9,602,446	0	805,194	10,407,640	1,300,955	0	7,275,000	0	65,048	$7,445,619	$2,962,021		$2,822,938	
Oct-97	11,582		45,108	$18.74	$1.63	$0.41	217,016	0	18,493	235,509	29,439		540,000		1,472	$541,472	($305,963)	$2,656	($276,961)	$2,546
Nov-97	10,962		42,682	$18.81	$1.65	$0.43	206,144	0	18,358	224,501	28,063		540,000		1,403	$541,403	($316,902)	$2,339	($284,493)	$2,261
Dec-97	11,079		43,150	$18.88	$1.67	$0.45	209,231	0	19,417	228,648	28,581		540,000		1,429	$541,429	($312,781)	$2,026	($278,472)	$1,983
Jan-98	10,844		42,232	$18.95	$1.69	$0.48	205,520	0	20,271	225,791	28,224		540,000		1,411	$541,411	($315,620)	$1,711	($278,678)	$1,704
Feb-98	9,579		37,305	$19.02	$1.71	$0.49	182,196	0	18,280	200,476	25,060		540,000		1,253	$541,253	($340,777)	$1,370	($298,404)	$1,406
Mar-98	10,370		40,409	$19.09	$1.70	$0.47	198,060	0	18,992	217,052	27,132		540,000		1,357	$541,357	($324,304)	$1,046	($281,632)	$1,124
Apr-98	9,826		38,276	$19.16	$1.68	$0.46	188,274	0	17,607	205,881	25,735		540,000		1,287	$541,287	($335,406)	$710	($286,866)	$835
May-98	9,932		38,683	$19.22	$1.67	$0.43	190,950	0	16,634	207,583	25,948		540,000		1,297	$541,297	($333,714)	$377	($285,034)	$550
Jun-98	9,411		36,652	$19.28	$1.66	$0.42	181,460	0	15,394	196,854	24,607		540,000		1,230	$541,230	($344,377)	$32	($291,710)	$259
Jul-98	9,517		37,065	$19.34	$1.67	$0.42	184,043	0	15,567	199,611	24,951		540,000		1,248	$541,248	($341,637)	($309)	($286,998)	($28)
Aug-98	9,316		36,280	$19.40	$1.68	$0.43	180,675	0	15,600	196,275	24,534		540,000		1,227	$541,227	($344,951)	($654)	($287,387)	($316)
Sep-98	8,829		34,385	$19.45	$1.70	$0.43	171,740	0	14,786	186,526	23,316		540,000		1,166	$541,166	($354,640)	($1,009)	($293,017)	($609)
FY-98	121,254	0	472,255				2,315,309	0	209,399	2,524,708	315,589	0	6,480,000	0	15,779	$6,495,779	($3,971,071)		($3,431,652)	
FY-99	0		0	$20.25	$1.77	$0.45	0	0	0	0	0		5,592,000		0	$5,592,000	($5,592,000)	($6,601)	($4,406,416)	($5,015)
FY-00	0		0	$21.08	$1.84	$0.47	0	0	0	0	0		4,382,000		0	$4,382,000	($4,382,000)	($10,983)	($3,139,048)	($8,154)
FY-1	0		0	$21.94	$1.92	$0.49	0	0	0	0	0		3,767,000		0	$3,767,000	($3,767,000)	($14,750)	($2,453,175)	($10,607)
FY-2	0		0	$22.84	$2.00	$0.50	0	0	0	0	0		3,230,650		0	$3,230,650	($3,230,650)	($17,981)	($1,912,626)	($12,520)
FY-3	0		0	$23.78	$2.08	$0.53	0	0	0	0	0		2,772,708		0	$2,772,708	($2,772,708)	($20,753)	($1,492,285)	($14,012)
FY-4	0		0	$24.76	$2.17	$0.55	0	0	0	0	0		2,380,969		0	$2,380,969	($2,380,969)	($23,134)	($1,164,954)	($15,177)
FY-5	0		0	$25.77	$2.25	$0.57	0	0	0	0	0		2,045,390		0	$2,045,390	($2,045,390)	($25,180)	($909,784)	($16,087)
FY-6	0		0	$26.83	$2.35	$0.59	0	0	0	0	0		1,757,623		0	$1,757,623	($1,757,623)	($26,937)	($710,715)	($16,798)
FY-7	0		0	$27.93	$2.44	$0.62	0	0	0	0	0		188,833		0	$188,833	($188,833)	($27,126)	($69,415)	($16,867)
FY-8				$29.07	$2.54	$0.64	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-9				$30.26	$2.65	$0.67	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-10				$31.50	$2.76	$0.70	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-11				$32.80	$2.87	$0.72	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-12				$34.14	$2.99	$0.75	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-13				$35.54	$3.11	$0.79	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-14				$37.00	$3.24	$0.82	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-15				$38.51	$3.37	$0.85	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-16				$40.09	$3.51	$0.89	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-17				$41.74	$3.65	$0.92	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
FY-18				$43.45	$3.80	$0.96	0	0	0	0	0				0	$0	$0	($27,126)	$0	($16,867)
Thereafter				$45.37	$4.36	$1.00	0	0	0	0	0				0	$0	$0	$0	$0	($16,867)
Total	644,664	0	2,510,701				11,917,755	0	1,014,593	12,932,348	1,616,544	0	39,872,173	0	80,827	$40,058,571	($27,126,223)		($16,867,131)	

PD-NP

Proved Developed Non-Producing

NPPR-3	PRODUCTION			PRICES			GROSS REVENUE				COSTS						Future Net Income				
	Oil	Gas	NGLS	Oil	Gas	NGLS	Oil	Gas	NGLS	Total	Royalty @	CapEx	OpEx	OH	Sev. Taxes	Total	Net Revenue	Cumulative	Discounted @	Cumulative Discounted
	bbls	mcf	gals	$	$	$	$	$	$	$	12.50%	$	$	$	8.00%	$	$	$000	9%	$000
Oct-96				$18.00	$1.57	$0.35	0	0	0	0	0					0	$0	$0	$0	$0	$0
Nov-96				$18.06	$1.58	$0.37	0	0	0	0	0					0	$0	$0	$0	$0	$0
Dec-96				$18.12	$1.60	$0.39	0	0	0	0	0					0	$0	$0	$0	$0	$0
Jan-97				$18.20	$1.62	$0.42	0	0	0	0	0					0	$0	$0	$0	$0	$0
Feb-97				$18.27	$1.65	$0.43	0	0	0	0	0					0	$0	$0	$0	$0	$0
Mar-97				$18.33	$1.64	$0.41	0	0	0	0	0					0	$0	$0	$0	$0	$0
Apr-97				$18.39	$1.61	$0.40	0	0	0	0	0					0	$0	$0	$0	$0	$0
May-97				$18.44	$1.60	$0.38	0	0	0	0	0					0	$0	$0	$0	$0	$0
Jun-97				$18.50	$1.58	$0.39	0	0	0	0	0					0	$0	$0	$0	$0	$0
Jul-97				$18.56	$1.60	$0.39	0	0	0	0	0					0	$0	$0	$0	$0	$0
Aug-97				$18.61	$1.62	$0.40	0	0	0	0	0					0	$0	$0	$0	$0	$0
Sep-97				$18.67	$1.62	$0.41	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-97	0	0	0				0	0	0	0	0	0	0	0	0	0	$0	$0		$0	
Oct-97				$18.74	$1.63	$0.41	0	0	0	0	0					0	$0	$0	$0	$0	$0
Nov-97				$18.81	$1.65	$0.43	0	0	0	0	0					0	$0	$0	$0	$0	$0
Dec-97				$18.88	$1.67	$0.45	0	0	0	0	0					0	$0	$0	$0	$0	$0
Jan-98				$18.95	$1.69	$0.48	0	0	0	0	0					0	$0	$0	$0	$0	$0
Feb-98				$19.02	$1.71	$0.49	0	0	0	0	0					0	$0	$0	$0	$0	$0
Mar-98				$19.09	$1.70	$0.47	0	0	0	0	0					0	$0	$0	$0	$0	$0
Apr-98				$19.16	$1.68	$0.46	0	0	0	0	0					0	$0	$0	$0	$0	$0
May-98				$19.22	$1.67	$0.43	0	0	0	0	0					0	$0	$0	$0	$0	$0
Jun-98				$19.28	$1.66	$0.42	0	0	0	0	0					0	$0	$0	$0	$0	$0
Jul-98				$19.34	$1.67	$0.42	0	0	0	0	0					0	$0	$0	$0	$0	$0
Aug-98				$19.40	$1.68	$0.43	0	0	0	0	0					0	$0	$0	$0	$0	$0
Sep-98				$19.45	$1.70	$0.43	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-98	0	0	0				0	0	0	0	0	0	0	0	0	0	$0	$0		$0	
FY-99				$20.25	$1.77	$0.45	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-00				$21.08	$1.84	$0.47	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-1				$21.94	$1.92	$0.49	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-2				$22.84	$2.00	$0.50	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-3				$23.78	$2.08	$0.53	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-4				$24.76	$2.17	$0.55	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-5				$25.77	$2.25	$0.57	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-6				$26.83	$2.35	$0.59	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-7				$27.93	$2.44	$0.62	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-8				$29.07	$2.54	$0.64	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-9				$30.26	$2.65	$0.67	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-10				$31.50	$2.76	$0.70	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-11				$32.80	$2.87	$0.72	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-12				$34.14	$2.99	$0.75	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-13				$35.54	$3.11	$0.79	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-14				$37.00	$3.24	$0.82	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-15				$38.51	$3.37	$0.85	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-16				$40.09	$3.51	$0.89	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-17				$41.74	$3.65	$0.92	0	0	0	0	0					0	$0	$0	$0	$0	$0
FY-18				$43.45	$3.80	$0.96	0	0	0	0	0					0	$0	$0	$0	$0	$0
Thereafter				$45.37	$4.56	$1.00	0	0	0	0	0					0	$0	$0	$0	$0	$0
Total	0	0	0				0	0	0	0	0	0	0	0	0	0	$0	$0		$0	

Proved Undeveloped

E	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
109	PUD																				
110		PRODUCTION			PRICES			GROSS REVENUE				COSTS						Future Net Income			
111	NPR-3	Oil	Gas	NGLs	Oil	Gas	NGLs	Oil	Gas	NGLs	Total	Royalty @	CapEx	OpEx	OH	Sev Taxes	Total	Net Revenue	Cumulative	Discounted @	Cumulative Discounted
112		bbls	mcf	gals	$	$	$	$	$	$	$	12.50%	$	$	$	5.00%	$	$	$000	0%	$000
113	Oct-96				$18.00	$1.57	$0.35	0	0	0	0	0	417,836			0	$417,836	($417,836)	($418)	($417,836)	($418)
114	Nov-96	872			$18.06	$1.58	$0.37	12,134	0	0	12,134	1,517	417,836	54,320		76	$472,232	($460,098)	($878)	($456,295)	($874)
115	Dec-96	2,062			$18.12	$1.60	$0.39	37,373	0	0	37,373	4,672	417,836	54,320		234	$472,390	($435,016)	($1,313)	($427,856)	($1,302)
116	Jan-97	2,902			$18.20	$1.62	$0.42	52,828	0	0	52,828	6,604	417,836	54,320		330	$472,486	($419,658)	($1,733)	($409,339)	($1,711)
117	Feb-97	6,754			$18.27	$1.65	$0.43	123,411	0	0	123,411	15,426	417,836	54,320		771	$472,927	($349,517)	($2,082)	($338,105)	($2,049)
118	Mar-97	8,665			$18.33	$1.64	$0.41	158,820	0	0	158,820	19,853	417,836	54,320		993	$473,149	($314,328)	($2,396)	($301,553)	($2,351)
119	Apr-97	9,219			$18.39	$1.61	$0.40	169,497	0	0	169,497	21,187	417,836	54,320		1,059	$473,215	($303,718)	($2,700)	($288,966)	($2,640)
120	May-97	10,810			$18.44	$1.60	$0.38	199,362	0	0	199,362	24,920	417,836	54,320		1,246	$473,402	($274,040)	($2,974)	($258,574)	($2,899)
121	Jun-97	12,012			$18.50	$1.58	$0.39	222,211	0	0	222,211	27,776	417,836	54,320		1,389	$473,545	($251,334)	($3,226)	($235,190)	($3,134)
122	Jul-97	14,049			$18.56	$1.60	$0.39	260,690	0	0	260,690	32,586	417,836	54,320		1,629	$473,785	($213,095)	($3,439)	($197,759)	($3,331)
123	Aug-97	14,496			$18.61	$1.62	$0.40	269,806	0	0	269,806	33,726	417,836	54,320		1,686	$473,842	($204,036)	($3,643)	($187,787)	($3,519)
124	Sep-97	15,120			$18.67	$1.62	$0.41	282,390	0	0	282,390	35,299	417,836	54,320		1,765	$473,921	($191,531)	($3,834)	($174,821)	($3,694)
125	FY-97	98,787	0	0				1,788,523	0	0	1,788,523	223,565	5,014,036	597,516	0	11,178	$5,822,736	($3,834,208)		($3,694,080)	
126	Oct-97	16,238			$18.74	$1.63	$0.41	305,360	0	0	305,360	38,170	196,000	41,471		1,909	$239,360	$65,981	($3,768)	$59,727	($3,634)
127	Nov-97	15,363			$18.81	$1.65	$0.43	290,125	0	0	290,125	36,266		0		1,813	$1,813	$288,312	($3,480)	$258,827	($3,376)
128	Dec-97	15,619			$18.88	$1.67	$0.45	294,128	0	0	294,128	36,766		0		1,838	$1,838	$292,289	($3,188)	$260,229	($3,115)
129	Jan-98	15,175			$18.95	$1.69	$0.48	288,641	0	0	288,641	36,080		0		1,804	$1,804	$286,837	($2,901)	$253,264	($2,862)
130	Feb-98	13,404			$19.02	$1.71	$0.49	255,867	0	0	255,867	31,983		0		1,599	$1,599	$254,268	($2,647)	$222,651	($2,639)
131	Mar-98	14,505			$19.09	$1.70	$0.47	277,871	0	0	277,871	34,734		0		1,737	$1,737	$276,134	($2,370)	$239,800	($2,400)
132	Apr-98	13,728			$19.16	$1.68	$0.46	263,920	0	0	263,920	32,990		0		1,650	$1,650	$262,271	($2,108)	$225,879	($2,174)
133	May-98	13,885			$19.22	$1.67	$0.43	267,726	0	0	267,726	33,466		0		1,673	$1,673	$266,053	($1,842)	$227,242	($1,946)
134	Jun-98	13,140			$19.28	$1.66	$0.42	254,106	0	0	254,106	31,763		0		1,588	$1,588	$252,518	($1,590)	$213,900	($1,733)
135	Jul-98	13,280			$19.34	$1.67	$0.42	257,567	0	0	257,567	32,196		0		1,610	$1,610	$255,957	($1,334)	$215,021	($1,518)
136	Aug-98	12,995			$19.40	$1.68	$0.43	252,776	0	0	252,776	31,597		0		1,580	$1,580	$251,196	($1,082)	$209,277	($1,308)
137	Sep-98	12,306			$19.45	$1.70	$0.43	249,188	0	0	249,188	31,149		0		1,557	$1,557	$247,631	($835)	$204,602	($1,104)
138	FY-98	169,538	0	0				3,257,275	0	0	3,257,275	407,159	196,000	41,471	0	20,358	$257,829	$2,999,446		$2,580,418	
139	FY-99	130,670			$20.25	$1.77	$0.45	2,645,979	0	0	2,645,979	330,747		423,795		16,537	$440,332	$2,205,646	$1,371	$1,738,017	$634
140	FY-00	101,835			$21.08	$1.84	$0.47	2,146,635	0	0	2,146,635	268,329		329,259		13,416	$342,875	$1,803,960	$3,175	$1,292,267	$1,927
141	FY-1	79,935			$21.94	$1.92	$0.49	1,754,078	0	0	1,754,078	219,260		284,056		10,963	$295,019	$1,459,059	$4,634	$950,180	$2,877
142	FY-2	63,310			$22.84	$2.00	$0.50	1,450,791	0	0	1,450,791	181,349		244,733		9,067	$253,800	$1,196,990	$5,831	$708,648	$3,585
143	FY-3	48,180			$23.78	$2.08	$0.53	1,145,724	0	0	1,145,724	143,216		211,316		7,161	$218,477	$927,248	$6,758	$499,049	$4,085
144	FY-4	36,329			$24.76	$2.17	$0.55	948,738	0	0	948,738	118,592		162,905		5,930	$188,835	$759,903	$7,518	$371,803	$4,456
145	FY-5	32,120			$25.77	$2.25	$0.57	827,733	0	0	827,733	103,467		158,747		5,173	$163,920	$663,813	$8,182	$295,262	$4,752
146	FY-6	25,915	1,825,000		$26.83	$2.35	$0.59	695,211	4,282,228	0	4,977,439	622,180		138,220		31,109	$169,329	$4,808,110	$12,990	$1,944,213	$6,696
147	FY-7	17,885	1,825,000		$27.93	$2.44	$0.62	499,465	4,457,800	0	4,957,265	619,658		120,772		30,983	$151,755	$4,805,510	$17,795	$1,766,511	$8,462
148	FY-8	13,140			$29.07	$2.54	$0.64	381,999	0	0	381,999	47,750		105,941		2,387	$108,328	$273,671	$18,069	$91,456	$8,554
149	FY-9				$30.26	$2.65	$0.67	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
150	FY-10				$31.50	$2.76	$0.70	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
151	FY-11				$32.80	$2.87	$0.72	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
152	FY-12				$34.14	$2.99	$0.75	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
153	FY-13				$35.54	$3.11	$0.79	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
154	FY-14				$37.00	$3.24	$0.82	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
155	FY-15				$38.51	$3.37	$0.85	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
156	FY-16				$40.09	$3.51	$0.89	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
157	FY-17				$41.74	$3.65	$0.92	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
158	FY-18				$43.45	$3.80	$0.96	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
159	Thereafter				$45.37	$4.36	$1.00	0	0	0	0	0				0	$0	$0	$18,069	$0	$8,554
160	Total	817,820	3,650,000	0				17,542,150	8,740,028	0	26,282,178	3,285,272	5,210,036	2,838,731	0	164,264	$8,213,031	$18,069,148		$8,553,746	

Unproven

NPR-3

		PRODUCTION			PRICES			GROSS REVENUE				COSTS						Future Net Income			
		Oil	Gas	NGLS	Oil	Gas	NGLS	Oil	Gas	NGLS	Total	Royalty @	CapEx	OpEx	OH	Sev. Taxes	Total	Net Revenue	Cumulative	Discounted @	Cumulative Discounted
		bbls	mcf	gals	$	$	$	$	$	$	$	12.50%	$	$	$	6.00%	$	$	$000	0%	$000
Oct-96					$18.00	$1.57	$0.35	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Nov-96					$18.06	$1.58	$0.37	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Dec-96					$18.12	$1.60	$0.39	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Jan-97					$18.20	$1.62	$0.42	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Feb-97					$18.27	$1.65	$0.43	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Mar-97					$18.33	$1.64	$0.41	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Apr-97					$18.39	$1.61	$0.40	0	0	0	0	0	0			0	0	$0	$0	$0	$0
May-97					$18.44	$1.60	$0.38	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Jun-97					$18.50	$1.58	$0.39	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Jul-97					$18.56	$1.60	$0.39	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Aug-97					$18.61	$1.62	$0.40	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Sep-97					$18.67	$1.62	$0.41	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-97		0	0	0				0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0
Oct-97					$18.74	$1.63	$0.41	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Nov-97					$18.81	$1.65	$0.43	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Dec-97					$18.88	$1.67	$0.45	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Jan-98					$18.95	$1.69	$0.48	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Feb-98					$19.02	$1.71	$0.49	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Mar-98					$19.09	$1.70	$0.47	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Apr-98					$19.16	$1.68	$0.46	0	0	0	0	0	0			0	0	$0	$0	$0	$0
May-98					$19.22	$1.67	$0.43	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Jun-98					$19.28	$1.66	$0.42	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Jul-98					$19.34	$1.67	$0.42	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Aug-98					$19.40	$1.68	$0.43	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Sep-98					$19.45	$1.70	$0.43	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-98		0	0	0				0	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0
FY-99					$20.25	$1.77	$0.45	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-00					$21.08	$1.84	$0.47	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-1					$21.94	$1.92	$0.49	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-2					$22.84	$2.00	$0.50	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-3					$23.78	$2.08	$0.53	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-4					$24.76	$2.17	$0.55	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-5					$25.77	$2.25	$0.57	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-6					$26.83	$2.35	$0.59	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-7					$27.93	$2.44	$0.62	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-8					$29.07	$2.54	$0.64	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-9					$30.26	$2.65	$0.67	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-10					$31.50	$2.76	$0.70	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-11					$32.80	$2.87	$0.72	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-12					$34.14	$2.99	$0.75	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-13					$35.54	$3.11	$0.79	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-14					$37.00	$3.24	$0.82	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-15					$38.51	$3.37	$0.85	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-16					$40.09	$3.51	$0.89	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-17					$41.74	$3.65	$0.92	0	0	0	0	0	0			0	0	$0	$0	$0	$0
FY-18					$43.45	$3.80	$0.96	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Thereafter					$45.37	$4.36	$1.00	0	0	0	0	0	0			0	0	$0	$0	$0	$0
Total		0	0	0				0	0	0	0	0	0	0	0	0	0	$0	$0	$0	

Depreciation and Depletion

	A	B	C	D	E	F	G	H	I	J
3	NPR-3	Revenue	Maximum % depletion	Taxable Income w/o Depletion	Allowable % Depletion	PDP Depletion		Tangible Capital	Double Declining Balance Factors	Depreciable Capital
4		$	$	$	$	%	$	$	%	$
5	FY-97	12,196,163	1,829,424	(2,578,602)	0	81.19%	405,956	1,002,807	14.29%	143,258
6	FY-98	5,781,983	867,297	(2,260,505)	0	18.81%	94,044	39,200	24.49%	251,185
7	FY-99	2,645,979	396,897	(4,064,185)	0	0.00%	0	0	17.49%	185,018
8	FY-00	2,146,635	321,995	(3,110,007)	0	0.00%	0	0	12.49%	132,156
9	FY-1	1,754,078	263,112	(2,729,035)	0	0.00%	0	0	8.92%	94,397
10	FY-2	1,450,791	217,619	(2,396,867)	0	0.00%	0	0	8.92%	92,998
11	FY-3	1,145,724	171,859	(2,151,849)	0	0.00%	0	0	8.92%	92,998
12	FY-4	948,738	142,311	(1,846,016)	0	0.00%	0	0	4.46%	48,248
13	FY-5	827,733	124,160	(1,537,492)	0	0.00%	0	0		1,749
14	FY-6	4,977,439	746,616	2,123,439	746,616	0.00%	0	0		0
15	FY-7	4,957,265	743,590	3,693,386	743,590	0.00%	0	0		0
16	FY-8	381,999	57,300	202,523	57,300	0.00%	0	0		0
17	FY-9	0	0	0	0	0.00%	0	0		0
18	FY-10	0	0	0	0	0.00%	0	0		0
19	FY-11	0	0	0	0	0.00%	0	0		0
20	FY-12	0	0	0	0	0.00%	0	0		0
21	FY-13	0	0	0	0	0.00%	0	0		0
22	FY-14	0	0	0	0	0.00%	0	0		0
23	FY-15	0	0	0	0	0.00%	0	0		0
24	FY-16	0	0	0	0	0.00%	0	0		0
25	FY-17	0	0	0	0	0.00%	0	0		0
26	FY-18	0	0	0	0	0.00%	0	0		0
27	Thereafter	0	0	0		0.00%	0	0		0
28	TOTAL	39,214,527	5,882,179	(16,655,210)	1,547,506	100.00%	500,000	1,042,007	100.00%	1,042,007

G	A	B	C
1		**LOAD NPR-2 DATA and CALCULATE**	**LOAD NPR-3 DATA and CALCULATE**
2		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
3		{SELECT NPR_2:B5..NPR_2:D51;NPR_2:B5}	{SELECT NPR_3:B5..NPR_3:D51;NPR_3:B5}
4		{EDIT-COPY}	{EDIT-COPY}
5		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
6	PDP	{SELECT Cash Flows:B6}	{SELECT Cash Flows:B6}
7		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
8		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
9		{SELECT NPR_2:E5..NPR_2:G51;NPR_2:E5}	{SELECT NPR_3:E5..NPR_3:G51;NPR_3:E5}
10		{EDIT-COPY}	{EDIT-COPY}
11		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
12		{SELECT Cash Flows:M6}	{SELECT Cash Flows:M6}
13		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
14		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
15		{SELECT NPR_2:H5..NPR_2:J51;NPR_2:H5}	{SELECT NPR_3:H5..NPR_3:J51;NPR_3:H5}
16		{EDIT-COPY}	{EDIT-COPY}
17		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
18		{SELECT Cash Flows:B59}	{SELECT Cash Flows:B59}
19		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
20	PD-NP	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
21		{SELECT NPR_2:K5..NPR_2:M51;NPR_2:K5}	{SELECT NPR_3:K5..NPR_3:M51;NPR_3:K5}
22		{EDIT-COPY}	{EDIT-COPY}
23		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
24		{SELECT Cash Flows:M59}	{SELECT Cash Flows:M59}
25		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
26		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
27		{SELECT NPR_2:N5..NPR_2:P51;NPR_2:N5}	{SELECT NPR_3:N5..NPR_3:P51;NPR_3:N5}
28		{EDIT-COPY}	{EDIT-COPY}
29	PUD	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
30		{SELECT Cash Flows:B113}	{SELECT Cash Flows:B113}
31		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
32		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
33		{SELECT NPR_2:Q5..NPR_2:S51;NPR_2:Q5}	{SELECT NPR_3:Q5..NPR_3:S51;NPR_3:Q5}
34		{EDIT-COPY}	{EDIT-COPY}
35		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
36		{SELECT Cash Flows:M113}	{SELECT Cash Flows:M113}
37		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
38		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
39		{SELECT NPR_2:T5..NPR_2:V51;NPR_2:T5}	{SELECT NPR_3:T5..NPR_3:V51;NPR_3:T5}
40		{EDIT-COPY}	{EDIT-COPY}
41		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
42	Unproven	{SELECT Cash Flows:B167}	{SELECT Cash Flows:B167}
43		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
44		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
45		{SELECT NPR_2:W5..NPR_2:Y51;NPR_2:W5}	{SELECT NPR_3:W5..NPR_3:Y51;NPR_3:W5}
46		{EDIT-COPY}	{EDIT-COPY}
47		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
48		{SELECT Cash Flows:M167}	{SELECT Cash Flows:M167}
49		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
50	final	{SELECT Main:D4}	{SELECT Main:D4}
51		{CELL-ENTER "NPR-2"}	{CELL-ENTER "NPR-3"}
52		{CALC}	{CALC}

	G	D	E
1		**LOAD NOSR-1 DATA and CALCULATE**	**LOAD NOSR-2 DATA and CALCULATE**
2		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
3		{SELECT NOSR_1:B5..NOSR_1:D51;NOSR_1:B5}	{SELECT NOSR_2:B5..NOSR_2:D51;NOSR_2:B5}
4		{EDIT-COPY}	{EDIT-COPY}
5		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
6		{SELECT Cash Flows:B6}	{SELECT Cash Flows:B6}
7		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
8		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
9		{SELECT NOSR_1:E5..NOSR_1:G51;NOSR_1:E5}	{SELECT NOSR_2:E5..NOSR_2:G51;NOSR_2:E5}
10		{EDIT-COPY}	{EDIT-COPY}
11		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
12		{SELECT Cash Flows:M6}	{SELECT Cash Flows:M6}
13		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
14		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
15		{SELECT NOSR_1:H5..NOSR_1:J51;NOSR_1:H5}	{SELECT NOSR_2:H5..NOSR_2:J51;NOSR_2:H5}
16		{EDIT-COPY}	{EDIT-COPY}
17		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
18		{SELECT Cash Flows:B59}	{SELECT Cash Flows:B59}
19		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
20		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
21		{SELECT NOSR_1:K5..NOSR_1:M51;NOSR_1:K5}	{SELECT NOSR_2:K5..NOSR_2:M51;NOSR_2:K5}
22		{EDIT-COPY}	{EDIT-COPY}
23		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
24		{SELECT Cash Flows:M59}	{SELECT Cash Flows:M59}
25		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
26		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
27		{SELECT NOSR_1:N5..NOSR_1:P51;NOSR_1:N5}	{SELECT NOSR_2:N5..NOSR_2:P51;NOSR_2:N5}
28		{EDIT-COPY}	{EDIT-COPY}
29		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
30		{SELECT Cash Flows:B113}	{SELECT Cash Flows:B113}
31		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
32		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
33		{SELECT NOSR_1:Q5..NOSR_1:S51;NOSR_1:Q5}	{SELECT NOSR_2:Q5..NOSR_2:S51;NOSR_2:Q5}
34		{EDIT-COPY}	{EDIT-COPY}
35		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
36		{SELECT Cash Flows:M113}	{SELECT Cash Flows:M113}
37		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
38		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
39		{SELECT NOSR_1:T5..NOSR_1:V51;NOSR_1:T5}	{SELECT NOSR_2:T5..NOSR_2:V51;NOSR_2:T5}
40		{EDIT-COPY}	{EDIT-COPY}
41		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
42		{SELECT Cash Flows:B167}	{SELECT Cash Flows:B167}
43		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
44		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\INPUT.WK3"}
45		{SELECT NOSR_1:W5..NOSR_1:Y51;NOSR_1:W5}	{SELECT NOSR_2:W5..NOSR_2:Y51;NOSR_2:W5}
46		{EDIT-COPY}	{EDIT-COPY}
47		{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}	{WINDOW-ACTIVATE "C:\CONSULT\GUST_DOE\MODEL.WK4"}
48		{SELECT Cash Flows:M167}	{SELECT Cash Flows:M167}
49		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}	{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
50		{SELECT Main:D4}	{SELECT Main:D4}
51		{CELL-ENTER "NOSR-1"}	{CELL-ENTER "NOSR-2"}
52		{CALC}	{CALC}

	G	F
1		**LOAD NOSR-3 DATA and CALCULATE**
2		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
3		{SELECT NOSR_3:B5..NOSR_3:D51;NOSR_3:B5}
4		{EDIT-COPY}
5		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
6		{SELECT Cash Flows:B6}
7		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
8		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
9		{SELECT NOSR_3:E5..NOSR_3:G51;NOSR_3:E5}
10		{EDIT-COPY}
11		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
12		{SELECT Cash Flows:M6}
13		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
14		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
15		{SELECT NOSR_3:H5..NOSR_3:J51;NOSR_3:H5}
16		{EDIT-COPY}
17		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
18		{SELECT Cash Flows:B59}
19		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
20		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
21		{SELECT NOSR_3:K5..NOSR_3:M51;NOSR_3:K5}
22		{EDIT-COPY}
23		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
24		{SELECT Cash Flows:M59}
25		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
26		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
27		{SELECT NOSR_3:N5..NOSR_3:P51;NOSR_3:N5}
28		{EDIT-COPY}
29		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
30		{SELECT Cash Flows:B113}
31		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
32		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
33		{SELECT NOSR_3:Q5..NOSR_3:S51;NOSR_3:Q5}
34		{EDIT-COPY}
35		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
36		{SELECT Cash Flows:M113}
37		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
38		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
39		{SELECT NOSR_3:T5..NOSR_3:V51;NOSR_3:T5}
40		{EDIT-COPY}
41		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
42		{SELECT Cash Flows:B167}
43		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
44		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\INPUT.WK3"}
45		{SELECT NOSR_3:W5..NOSR_3:Y51;NOSR_3:W5}
46		{EDIT-COPY}
47		{WINDOW-ACTIVATE "C:\CONSULTI\GUST_DOE\MODEL.WK4"}
48		{SELECT Cash Flows:M167}
49		{EDIT-PASTE-SPECIAL ;"CELL-CONTENTS"}
50		{SELECT Main:D4}
51		{CELL-ENTER "NOSR-3"}
52		{CALC}

G
Print Cash Flows Individually
{EDIT-GOTO Cash Flows:A1}
{SET "PRINT-HEADER-LEFT-TEXT";""}
{SET "PRINT-HEADER-CENTER-TEXT";"\a1"}
{SET "PRINT-HEADER-RIGHT-TEXT";""}
{SET "PRINT-FOOTER-LEFT-TEXT";"Gustavson Associates"}
{SET "PRINT-FOOTER-CENTER-TEXT";" @ +"}
{SET "PRINT-FOOTER-RIGHT-TEXT";"^"}
{SET "PRINT-SIZE";"FIT-ALL"}
{SET "PRINT-ORIENTATION";"LANDSCAPE"}
{SELECT Cash Flows:A2..Cash Flows:U53}
{PRINT "SELECTION";1;9;1;1}
{SELECT Cash Flows:U55..Cash Flows:A106}
{PRINT "SELECTION";1;9;1;1}
{SELECT Cash Flows:A109..Cash Flows:U160}
{PRINT "SELECTION";1;9;1;1}
{SELECT Cash Flows:U163..Cash Flows:A214}
{PRINT "SELECTION";1;9;1;1}
{EDIT-GOTO Main:D1}
{Quit}

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1		**Print BFIT Sum**	**Print FIT Calculations**
2		{EDIT-GOTO BFIT Sum:A1}	{EDIT-GOTO Tax Calculation:A1}
3		{SET "PRINT-HEADER-LEFT-TEXT";""}	{SET "PRINT-HEADER-LEFT-TEXT";""}
4		{SET "PRINT-HEADER-CENTER-TEXT";"\a1"}	{SET "PRINT-HEADER-CENTER-TEXT";"\a1"}
5		{SET "PRINT-HEADER-RIGHT-TEXT";""}	{SET "PRINT-HEADER-RIGHT-TEXT";""}
6		{SET "PRINT-FOOTER-LEFT-TEXT";"Gustavson Associates"}	{SET "PRINT-FOOTER-LEFT-TEXT";"Gustavson Associates"}
7		{SET "PRINT-FOOTER-CENTER-TEXT";" @, +"}	{SET "PRINT-FOOTER-CENTER-TEXT";" @, +"}
8		{SET "PRINT-FOOTER-RIGHT-TEXT";"^"}	{SET "PRINT-FOOTER-RIGHT-TEXT";"^"}
9		{SET "PRINT-SIZE";"FIT-ALL"}	{SET "PRINT-SIZE";"FIT-ALL"}
10		{SET "PRINT-ORIENTATION";"LANDSCAPE"}	{SET "PRINT-ORIENTATION";"LANDSCAPE"}
11		{SET "PRINT-RANGE";BFIT Sum:A3...BFIT Sum:R55}	{SET "PRINT-RANGE";Tax Calculation:A1..Tax Calculation:N39}
12		{PRINT ;1;9;1;1}	{PRINT ;1;9;1;1}
13		{SELECT Main:D1}	{SELECT Main:D1}
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1		**Print Main page**		
2		{SET "PRINT-HEADER-LEFT-TEXT";""}		
3		{SET "PRINT-HEADER-CENTER-TEXT";"\a1"}		
4		{SET "PRINT-HEADER-RIGHT-TEXT";""}		
5		{SET "PRINT-FOOTER-LEFT-TEXT";"Gustavson Associates"}		
6		{SET "PRINT-FOOTER-CENTER-TEXT";" @, +"}		
7		{SET "PRINT-FOOTER-RIGHT-TEXT";"^"}		
8		{SET "PRINT-SIZE","FIT-ALL"}		
9		{SET "PRINT-ORIENTATION";"LANDSCAPE"}		
10		{SELECT Main:H3..Main:A40;Main:H3}		
11		{PRINT "SELECTION";1;9;1;1}		
12		{EDIT-GOTO Main:D1}		
13		{Quit}		
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APPENDIX E

LIST OF FEDERAL LEASE SALES IN EASTERN WYOMING

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

County	Serial Number	Lessor	Lessee	Date Effective	File Date	Bonus $/Acre	Acres	Total Bonus $	Rlty	Rental $/Acre	Term Years	Location
Converse	129044	U.S.A.	Yates Petroleum Company	5/1/93	4/6/93	$ 12.00	240.00	$ 2,880.00	12.5%	$ 1.50	10	T37N R77W SEC 1 SENE, NESE SEC 12 NWNE, SWSE SEC 23 SWSW, SEC 24 NESE
Johnson	129045	U.S.A.	Harvey M J Jr.	5/1/93	4/6/93	$ 4.00	40.00	$ 160.00	12.5%	$ 1.50	10	T43N R77W SEC 3 SENE
Natrona	129052	U.S.A.	Bissell Oil Co.	5/1/93	4/6/93	$ 4.00	1000.00	$ 4,000.00	12.5%	$ 1.50	10	T39N R79W SEC 8 NWSW SEC 9 N2, E2SW, SE SEC 10 SW, SEC 17 NENE, NESW, SE
Natrona	129053	U.S.A.	EP Oper Ltd Partnership.	5/1/93	4/6/93	$ 2.00	1120.00	$ 2,240.00	12.5%	$ 1.50	10	T39N R79W SEC 14 N2SW, SESW, S2SE, SEC 21 SENE, SEC 23 NWNE, NESW, S2SW, SE, SEC 26 NE, N2SE, SEC 34 NW, SEC 35 SW
Johnson	129054	U.S.A.	Rose Norma	5/1/93	4/6/93	$ 2.00	240.00	$ 480.00	12.5%	$ 1.50	10	T43N R79W SEC 4 S2S2 SEC 8 S2NW
Converse	129533	U.S.A.	Energy Partners Nominee	7/1/93	6/1/93	$ 21.00	79.35	$ 1,680.00	12.5%	$ 1.50	10	T37N R75W SEC 23 LOTS 5,6
Converse	129534	U.S.A.	Petrogulf Corp.	7/1/93	6/1/93	$ 29.00	120.00	$ 3,480.00	12.5%	$ 1.50	10	T38N R75W SEC 35 N2NE, SWNE
Converse	129541	U.S.A.	Energy Partners Nominee	7/1/93	6/1/93	$115.00	320.00	$ 36,800.00	12.5%	$ 1.50	10	T36N R76W SEC 29 E2
Converse	129542	U.S.A.	Yates Petroleum Company	7/1/93	6/1/93	$ 12.00	160.00	$ 1,920.00	12.5%	$ 1.50	10	T39N R76W SEC 5 S2NE, W2SE
Converse	129543	U.S.A.	Yates Petroleum Company	7/1/93	6/1/93	$ 16.00	80.00	$ 1,280.00	12.5%	$ 1.50	10	T39N R76W SEC 32 NENW, SEC 33 NWNW
Converse	129547	U.S.A.	Andex Partners	7/1/93	6/1/93	$ 2.00	240.00	$ 480.00	12.5%	$ 1.50	10	T35N R77W SEC 1 N2SE T36N R77W SEC 23 SE
Natrona	129548	U.S.A.	O'Connell R K	7/1/93	6/1/93	$ 2.00	390.00	$ 782.00	12.5%	$ 1.50	10	T36N R77W SEC 19 LOTS 3,4, SEC 33 E2NE T36N R78W SEC 24 S2NE, SE
Converse Natrona	129549	U.S.A.	Yates Petroleum Company	7/1/93	6/1/93	$ 2.00	480.00	$ 962.00	12.5%	$ 1.50	10	T37N R77W SEC 3 LOTS 3,4, SWNW, NWSW, SEC 11 N2N2, SWNW, N2SW, SWSW
Johnson	129550	U.S.A.	Rose Norma	7/1/93	6/1/93	$ 2.00	320.00	$ 640.00	12.5%	$ 1.50	10	T42N R77W SEC 20 E2SE, SEC 27 W2NW, SENW, SEC 28 N2NE, NENW
Johnson	129551	U.S.A.	Rose Norma	7/1/93	6/1/93	$ 8.00	362.21	$ 2,904.00	12.5%	$ 1.50	10	T43N R77W SEC 30 E2SW, SEC 31 LOTS 4, E2W2, N2SE

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Johnson	129556	U.S.A.	Rose Norma	7/1/93	6/1/93	$ 2.00	1915.45	$ 3,832.00	12.5%	$ 1.50	10	T43N R78W SEC 5 LOTS 4,S2NW, NWSE, SEC 6 SWNE, SENW, SEC 17 S2NE, SENW, S2, SEC 19 SENW, E2 SW, SE, SEC 20 SW, SWSE, SEC 30 E2, SENW, E2SW, SEC 31 LOTS 2, S2NE, SENW.
Natrona	130103	U.S.A.	Yates Petroleum Corporation	9/1/93	8/3/93	$ 2.00	880.00	$ 1,760.00	12.5%	$ 1.50	10	T39N R77W SEC 21 N2NW, SWNW, SW, SEC 28 NE, N2SE, SWSE, SEC 33 E2
Converse Natrona	130104	U.S.A.	Yates Petroleum Corporation	9/1/93	8/3/93	$ 3.00	840.00	$ 2,520.00	12.5%	$ 1.50	10	T40N R77W SEC 8 N2, SEC 20 NW, SEC 21 SW, SEC 23 NENE, S2N2
Natrona	130105	U.S.A.	Yates Petroleum Corporation	9/1/93	8/3/93	$ 2.00	597.28	$ 1,196.00	12.5%	$ 1.50	10	T40N R77W SEC 30 LOTS1-4, E2SW, SEC 31 LOTS 1-4, E2W2
Natrona	130115	U.S.A.	Rose Norma	9/1/93	8/3/93	$ 3.00	1957.56	$ 5,874.00	12.5%	$ 1.50	10	T37N R78W SEC 2 N2SE, SESE, SEC 11 SESE, SEC 13 N2NW, SWNW, NWSW, SEC 14 NENW, S2NW, SE, SEC 15 SWNW, NWSW, SEC 18 LOTS 3, SE, SEC 20 NENW, SEC 23 N2NW, SENW, SEC 25 SWNE, W2, SEC 26 S2, SEC 27 E2NW, SEC 28 S2NE, SEC 35 N2NE
Johnson	130116	U.S.A.	Rose Norma	9/1/93	8/3/93	$ 4.00	802.43	$ 3,212.00	12.5%	$ 1.50	10	T42N R78W SEC 1 LOTS 1-4, S2N2, N2SW, SE, SEC 5 NWSW, SESW, S2SE, SEC 6 N2SE
Converse	130619	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 8.00	280.00	$ 2,240.00	12.5%	$ 1.50	10	T37N R76W SEC 10 NW, N2SW, SESW
Converse	130620	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 6.00	480.00	$ 2,880.00	12.5%	$ 1.50	10	T38N R76W SEC 32 NE SEC 33 N2
Converse	130621	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T39N R76W SEC 15 N2NW
Johnson	130622	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 2.00	158.81	$ 318.00	12.5%	$ 1.50	10	T 43N R76W SEC 19 LOTS 4, E2SW, SEC 20 SENW
Converse Natrona	130626	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 32.00	477.31	$ 15,296.00	12.5%	$ 1.50	10	T36N R77W SEC 1, LOTS 1-2, SEC 13 S2NE, SEC 25 NW, SEC 27 S2N2
Converse	130627	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 10.00	1436.76	$ 14,370.00	12.5%	$ 1.50	10	T39N R77W SEC 1 LOTS 1-4, S2N2, S2, SEC 2 LOTS 1-3, S2NE, SENW, N2SE, SEC 12 E2, E2W2
Converse Natrona	130628	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 14.00	1160.00	$ 16,240.00	12.5%	$ 1.50	10	T39N R77W SEC 10 NWSW, SEC 13 N2, N2SW, SE, SEC 14 S2N2, S2, SEC 15 S2SE

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Converse	130629	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 15.00	1960.00	$ 29,400.00	12.5%	$ 1.50	10	T39N R77W SEC 23 E2, NENW, S2SW, SEC 24 ALL, SEC 25 S2NE, NW, S2, SEC 26 E2
Converse	130630	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T40N R77W SEC 11 W2SW
Natrona	130631	U.S.A.	Yates Petroleum Corporation	11/1/93	10/5/93	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T40N R77W SEC 19 NE
Natrona	130641	U.S.A.	T-K Production Company	11/1/93	10/5/93	$ 2.00	600.00	$ 1,200.00	12.5%	$ 1.50	10	T37N R78W SEC 8 NWSE, SEC 9 NE, N2NW, SENW, SEC 10 SW, SEC 27 SWNW, SEC 31 S2SE
Johnson	130642	U.S.A.	Rose Norma	11/1/93	10/5/93	$ 2.00	800.00	$ 1,600.00	12.5%	$ 1.50	10	T43N R78W SEC 9 E2W2, SWSW, SEC 20 NENE, N2NW T43N R79W SEC 25 S2S2, SEC 26 S2S2, SEC 35 NE
Natrona	130645	U.S.A.	North Finn	11/1/93	10/5/93	$ 2.00	314.86	$ 630.00	12.5%	$ 1.50	10	T40N R79W SEC 20 S2NE, E2SE, SEC 21 SWNW, W2SW, SEC 31 LOTS 3
Converse	131221	U.S.A.	Yates Petroleum Corporation	11/1/93	12/14/93	$ 5.00	40.00	$ 200.00	12.5%	$ 1.50	10	T40N R75W SEC 9 SWNE
Converse	131223	U.S.A.	Rose Norma	2/1/94	12/14/93	$ 5.00	160.00	$ 800.00	12.5%	$ 1.50	10	T35N R76W SEC 28 W2NW SEC 34 W2SW
Converse Natrona	131226	U.S.A.	Winona Oil Co.	2/1/94	12/14/93	$ 2.00	240.00	$ 480.00	12.5%	$ 1.50	10	T34N R77W SEC 20 SWNW, SEC 26 NENE, SEC 28 N2NE, SEC 29 NENE, SWNE
Natrona	131227	U.S.A.	Rosa Norma	2/1/94	12/14/93	$ 58.00	159.25	$ 9,280.00	12.5%	$ 1.50	10	T35N R77W SEC 3 LOTS 4, SEC 3 SWNW, W2SW
Converse Natrona	131228	U.S.A.	Yates Petroleum Corporation	2/1/94	12/14/93	$ 2.00	1042.02	$ 2,086.00	12.5%	$ 1.50	10	T37N R77W SEC 1 LOTS 1,4, S2NW, N2SW, SESW, SWSE, SEC 2 S2, SEC4 LOTS 1-4, SEC 15 SESE, SEC 22 SE, SEC 35, SWSW
Natrona	131234	U.S.A.	Rosa Norma	2/1/94	12/14/93	$ 2.00	1158.65	$ 2,318.00	12.5%	$ 1.50	10	T37N R78W, SEC 2 SWSE, SEC 22 E2SW, SEC 26 NE, SEC 27 E2SW, SEC 28 N2NE, SEC 29 N2, NESE, SEC 30 LOTS 3,4, NE, N2SE, SESE
Natrona	131235	U.S.A.	EP Operating Co.	9/1/94	12/14/93	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T39N R78W SEC 1 SWSW, SEC 13 SESE
Natrona	131236	U.S.A.	EP Operating Co.	9/1/94	12/14/93	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T39N R78W SEC 10 NWNW, SEC 15 NENE
Converse	132263	U.S.A.	Yates Petroleum Corporation	6/1/94	4/5/94	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T40N R76W SEC 9 N2NE
Converse Natrona	132269	U.S.A.	Yates Petroleum Corporation	6/1/94	4/5/94	$ 4.00	960.00	$ 3,840.00	12.5%	$ 1.50	10	T36N R77W SEC 12 NW, S2, SEC 14 NE, SEC 21 NE, SEC 33 NW

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Natrona	132270	U.S.A.	Yates Petroleum Corporation	6/1/94	4/5/94	$ 2.00	760.00	$ 1,520.00	12.5%	$ 1.50	10	T39N R77W SEC 5 SE SEC 9 W2NE, SENE, W2, SE
Natrona	132271	U.S.A.	Yates Petroleum Corporation	6/1/94	4/5/94	$ 2.00	200.00	$ 400.00	12.5%	$ 1.50	10	T40N R77W SEC 15 S2SW, SEC22 E2NE, SENW
Natrona	132272	U.S.A.	Yates Petroleum Corporation	6/1/94	4/5/94	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T41N R77W SEC 32 SW
Natrona	132275	U.S.A.	Rose Norma	6/1/94	4/5/94	$ 2.00	400.00	$ 800.00	12.5%	$ 1.50	10	T37N R78W SEC 22 SESE, SEC 23 E2SW, SEC 26 NW, SEC 27 N2NE, SENE
Johnson	132276	U.S.A.	Celsius Energy Co.	6/1/94	4/5/94	$ 2.00	153.94	$ 308.00	12.5%	$ 1.50	10	T43N R78W SEC 6 LOTS 1-4
Johnson	132277	U.S.A.	Rose Norma	6/1/94	4/5/94	$ 2.00	839.78	$ 1,680.00	12.5%	$ 1.50	10	T43N R78W SEC 19 LOTS 3,4, N2NE, NENW, SEC 20 W2NE, SENE, N2SE, SEC 21 N2SW, SE, SEC 30, LOTS 1-4, NENW, SEC 31 LOTS 1
Natrona	132932	U.S.A.	Yates Petroleum Corporation	9/1/94	6/7/94	$ 2.00	922.93	$ 1,846.00	12.5%	$ 1.50	10	T38N R77W SEC 4 LOTS 2-4, S2N2, S2, SEC 5 LOTS 1,2, S2NE, SE
Natrona	132933	U.S.A.	Yates Petroleum Corporation	9/1/94	6/7/94	$ 2.00	360.00	$ 720.00	12.5%	$ 1.50	10	T39N R77W SEC 8 E2 SEC 17 NENE
Johnson	132934	U.S.A.	McLean James D	8/1/94	6/7/94	$ 4.00	445.54	$ 1,784.00	12.5%	$ 1.50	10	T42N R77W SEC 2 LOTS 1,2, S2NE, W2SE, SEC 7 LOTS 1,2, SENW, N2SE
Johnson	132935	U.S.A.	McLean James D	8/1/94	6/7/94	$ 2.00	118.74	$ 238.00	12.5%	$ 1.50	10	T43N R77W SEC 3 LOTS 4, SWNE, SENW
Natrona	132937	U.S.A.	Winona Oil Co.	8/1/94	6/7/94	$ 2.00	120.00	$ 240.00	12.5%	$ 1.50	10	T34N R78W SEC 15 SESW, S2SE
Johnson	132938	U.S.A.	Rose Norma	8/1/94	6/7/94	$ 2.00	39.86	$ 80.00	12.5%	$ 1.50	10	T42N R78W SEC 6 LOT 1
Johnson	132940	U.S.A.	Rose Norma	8/1/94	6/7/94	$ 2.00	520.00	$ 1,040.00	12.5%	$ 1.50	10	T43N R79W SEC 4 NWSE, SEC 5 S2SE, SEC 8 N2NW, SEC 9 N2
Johnson	132941	U.S.A.	Rose Norma	8/1/94	6/7/94	$ 2.00	1040.00	$ 2,080.00	12.5%	$ 1.50	10	T43N R79W SEC 19 SE, SEC 21, NE, S2NW, SW, N2SE, SWSE, SEC 28 NW, NWSW, SEC 30 NE
Converse	133618	U.S.A.	Yates Petroleum Corporation	10/1/94	8/2/94	$ 2.00	642.11	$ 1,286.00	12.5%	$ 1.50	10	T39N R76W SEC 5 LOTS 3,4, S2NW, SW, SEC 17 SE, SEC 28 SW
Converse	133619	U.S.A.	Yates Petroleum Corporation	10/1/94	8/2/94	$ 4.00	634.54	$ 2,540.00	12.5%	$ 1.50	10	T40N R76W LOTS 3,4, SEC 6 LOTS 1-7, S2NE, SENW, E2SW, SE
Converse	133624	U.S.A.	Winona Oil Co.	10/1/94	8/2/94	$ 2.00	40.00	$ 80.00	12.5%	$ 1.50	10	T34N R77W SEC 27 NESE
Converse	133625	U.S.A.	O'Connell RK	10/1/94	8/2/94	$ 60.00	160.00	$ 9,600.00	12.5%	$ 1.50	10	T35N R77W SEC 2 SW
Converse	133626	U.S.A.	Yates Petroleum Corporation	10/1/94	8/2/94	$ 3.00	1117.29	$ 3,354.00	12.5%	$ 1.50	10	T36N R77W SEC 2 LOTS 1,2, S2NE, SW, SEC 3 SE, SEC 24 SW, SEC 25 NE, SW, SEC 26, SE

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Natrona	133627	U.S.A.	Yates Petroleum Corporation	10/1/94	8/2/94	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T37N R77W SEC 34 NE
Natrona	133631	U.S.A.	Winona Oil Co.	10/1/94	8/2/94	$ 2.00	280.00	$ 560.00	12.5%	$ 1.50	10	T34N R78W SEC 14, SESE, SEC 22 E2NE, N2NW, SENW, SEC 23 SENE
Converse Natrona	134237	U.S.A.	Yates Petroleum Corporation	11/1/94	10/4/94	$ 2.00	560.00	$ 1,120.00	12.5%	$ 1.50	10	T36N R77W SEC 14 SW, SEC 15 NE, SEC 22 NE, SEC 33 W2NE
Natrona	134238	U.S.A.	Yates Petroleum Corporation	11/1/94	10/4/94	$ 2.00	320.00	$ 640.00	12.5%	$ 1.50	10	T37N R77W SEC 4 S2
Cambell Johnson	134912	U.S.A.	Flying J Oil & Gas Inc.	2/1/95	12/6/94	$ 23.00	1115.27	$ 25,651.21	12.5%	$ 1.50	10	T43N R76W SEC 5 LOTS 1-4, S2N2, S2 T44N R76W SEC 31 LOTS 1-4, E2W2, SEC 32 SW
Converse	134917	U.S.A.	Yates Petroleum Corporation	2/1/95	12/6/94	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T37N R77W SEC 2 S2NE
Natrona	134918	U.S.A.	Yates Petroleum Corporation	2/1/95	12/6/94	$ 2.00	560.00	$ 1,120.00	12.5%	$ 1.50	10	T37N R77W SEC 22 SW, SEC 27 E2, N2SW
Natrona	134925	U.S.A.	Winona Oil Co.	2/1/95	12/6/94	$ 2.00	280.00	$ 560.00	12.5%	$ 1.50	10	T34N R78W SEC 12 SESE, SEC 15 NE, SEC 28 W2NE
Natrona	134926	U.S.A.	Klabzuba Oil & Gas	2/1/95	12/6/94	$ 2.00	40.00	$ 80.00	12.5%	$ 1.50	10	T37N R78W SEC 25 SENE
Johnson	134927	U.S.A.	Westech Energy Corp.	2/1/95	12/6/94	$ 2.00	1200.00	$ 2,400.00	12.5%	$ 1.50	10	T43N R78W SEC 19 S2NE, SEC 22 NE, S2NW, S2, SEC 26 S2NE, N2NW, SEC 34 W2, E2SE
Johnson	134929	U.S.A.	Westech Energy Corp.	2/1/95	12/6/94	$ 2.00	920.01	$ 1,842.00	12.5%	$ 1.50	10	T43N R80W SEC 1 LOTS 1, S2NE, SE, SEC 4 S2SE, SEC 9 S2SE SEC 10 N2, SW
Converse	135626	U.S.A.	Yates Petroleum Corporation	4/1/95	2/7/95	$ 2.00	157.75	$ 316.00	12.5%	$ 1.50	10	T37N R77W SEC 2 LOTS 1-4
Natrona	135627	U.S.A.	Rose Norma	4/1/95	2/7/95	$ 2.00	77.90	$ 156.00	12.5%	$ 1.50	10	T37N R77W SEC 7 LOTS 1, SENW
Johnson	135628	U.S.A.	Westech Energy Corp.	4/1/95	2/7/95	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T42N R77W SEC 33 SENE, SESW
Johnson	135632	U.S.A.	Westech Energy Corp.	4/1/95	2/7/95	$ 2.00	1640.00	$ 3,280.00	12.5%	$ 1.50	10	T43N R79W SEC 4 SWNW, N2SW, SEC 5 S2NW, SW, SEC 6 S2NE, E2SW, SE, SEC 7 E2NW, N2SE, SWSE, SEC 8 N2SW T44N R79W SEC 28 S2SW, SEC 32 W2NE, SENE, NW, S2
Johnson	136169	U.S.A.	Westech Energy Corp.	4/1/95	4/4/95	$ 2.00	266.19	$ 534.00	12.5%	$ 1.50	10	T43N R79W SEC 19 LOTS 3-4, NENE, S2NE, E2SW
Johnson	136170	U.S.A.	Westech Energy Corp.	5/1/95	4/4/95	$ 2.00	1120.00	$ 2,240.00	12.5%	$ 1.50	10	T43N R79W SEC 20 S2NE, W2, SE, SEC 29 NE, W2, N2SE

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Johnson	136171	U.S.A.	Westech Energy Corp.	5/1/95	4/4/95	$ 2.00	73.46	$ 148.00	12.5%	$ 1.50	10	T43N R79W SEC 30 LOTS 1, NENW
Johnson	136172	U.S.A.	Westech Energy Corp.	5/1/95	4/4/95	$ 2.00	280.00	$ 560.00	12.5%	$ 1.50	10	T43N R80W SEC 12 NESE, S2SE, SEC 14 N2NE, SENW, SEC 15 SWNW
Johnson	136687	U.S.A.	Westech Energy Corp.	7/1/95	6/6/95	$ 2.00	480.00	$ 960.00	12.5%	$ 1.50	10	T42N R77W SEC 15 NESW, SWSW, SEC 21 N2NE, SWNE, N2SE, SEC 22 NENW, S2NW, S2SW
Natrona	137107	U.S.A.	Burnett Oil Co.	9/1/95	8/1/95	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T35N R77W SEC 7 E2SW SEC 10 W2SW
Natrona Johnson	137108	U.S.A.	Yates Petroleum Corporation	9/1/95	8/1/95	$ 4.00	320.00	$ 1,280.00	12.5%	$ 1.50	10	T41N R77W SEC 26 W2
Johnson	137109	U.S.A.	Westech Energy Corp.	9/1/95	8/1/95	$ 8.00	844.41	$ 6,760.00	12.5%	$ 1.50	10	T42N R77W SEC 6 LOTS 3,5,7, NESW, N2SE, SEC 7 S2NE S2SE, SEC 17 NENE, SESW, NESE, SEC 21 SENE, NENW, E2SW, S2SE, SEC 22 N2SW
Natrona	137110	U.S.A.	Winona Oil Co.	9/1/95	8/1/95	$ 2.00	80.00	$ 160.00	12.5%	$ 1.50	10	T34N R78W SEC 15 N2SE
Johnson	137111	U.S.A.	Westech Energy Corp.	9/1/95	8/1/95	$ 2.00	2203.21	$ 4,408.00	12.5%	$ 1.50	10	T42N R78W SEC 2 LOTS1-4, S2N2, SEC 3 SENE T43N R78W SEC 25 ALL SEC 26 N2NE, N2SE, SEC 27 E2, SEC 34 E2NE, SEC 35 ALL
Johnson	137112	U.S.A.	Westech Energy Corp.	9/1/95	8/1/95	$ 2.00	40.00	$ 80.00	12.5%	$ 1.50	10	T42N R78W SEC 32 SE SEC 33 S2SW
Johnson	137113	U.S.A.	Westech Energy Corp.	9/2/95	8/2/95	$ 2.00	240.00	$ 480.00	12.5%	$ 1.50	10	T43N R78W SEC 32 SE SEC 33 S2SW
Converse	137640	U.S.A.	Yates Petroleum Corporation		10/3/95	$ 2.00	305.96	$ 612.00	12.5%	$ 1.50	10	T36N R76W SEC 18 LOTS 1-4, E2W2
Converse	137641	U.S.A.	Obourn John L. Jr.		10/3/95	$ 80.00	160.00	$ 12,800.00	12.5%	$ 1.50	10	T36N R76W SEC 22 SE
Converse	137642	U.S.A.	Yates Petroleum Corporation		10/3/95	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T37N R76W SEC 26 SE
Converse	137643	U.S.A.	Yates Petroleum Corporation		10/3/95	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T38N R76W SEC 29 NE
Converse	137647	U.S.A.	Yates Petroleum Corporation		10/3/95	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T36N R77W SEC 13 N2SE, SESE, SEC 25 SESE.
Converse	137648	U.S.A.	Yates Petroleum Corporation		10/3/95	$ 2.00	160.00	$ 320.00	12.5%	$ 1.50	10	T38N R77W SEC 26 NW
Johnson	137654	U.S.A.	Hanson & Strahn Enerryg		10/3/95	$ 2.00	240.00	$ 480.00	12.5%	$ 1.50	10	T43N R79W SEC 4 SENE, SEC 5 S2NE, SEC 6 SENW T44N R79W SEC 31 NENE, SEC 32 NENE.

LIST OF FEDERAL LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Johnson	137655	U.S.A.	Hanson & Strahn Enerryg		10/3/95	$ 2.00	40.00	$ 80.00	12.5%	$ 1.50	10	T43N R79W SEC 7 NESW
Johnson	137657	U.S.A.	Hanson & Strahn Enerryg		10/3/95	$ 2.00	640.00	$ 1,280.00	12.5%	$ 1.50	10	T43N R 80W SEC 25 SW, S2SE, SEC 26 S2NE, NW, SEC 27 N2NE, N2SE
Campbell	138135	U.S.A.	Spencer Russell A	2/1/96	12/5/95	$ 2.00	960.00	$ 1,920.00	12.5%	$ 1.50	10	T43N R75W SEC 11 N2, W2SW, SE, SEC 13 NW, SEC 14 NENE, S2N2, NWNW
Converse Natrona	138138	U.S.A.	O'Connell R K	2/1/96	12/5/95	$ 25.00	240.00	$ 6,000.00	12.5%	$ 1.50	10	T34N R77W SEC 27 NE, E2NW
Natrona	138449	U.S.A.	Mitchell Charles L	3/1/96	2/6/96	$ 2.00	1039.42	$ 2,080.00	12.5%	$ 1.50	10	T37N R78W SEC 2 NWSW, S2SW, SEC 3 LOTS 2-4 S2N2, S2, SEC 4 S2N2, SEC 8 NE

APPENDIX F

LIST OF STATE LEASE SALES IN EASTERN WYOMING

LIST OF STATE LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

County	Lease #		Lessors	Lessee	Effect Date	Lease Date	Bonus $/Acre	Annual Delay Rental	Acres	Total Amount $	Rlty	Term Years	Location
Converse	46	93-41	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T34N R75W SEC 36 NESW,SWSW, NESE, SWSE
Converse	47	93-42	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 36.00	$ 1.00	80.00	$ 2,994.60	1/6	5	T38N R75W SEC 36 W2NW
Converse	48	93-43	State of Wyoming	Presidio Exploration	3/2/93	2/2/93	$ 6.00	$ 1.00	640.00	$ 4,581.80	1/6	5	T40N R75W SEC 16 ALL
Converse	49	93-44	State of Wyoming	Presidio Exploration	3/2/93	2/2/93	$ 80.00	$ 1.00	80.00	$ 6,154.60	1/6	5	T40N R75W SEC 17 S2NE
Campbell	50	93-45	State of Wyoming	Kerr-McGee Corporation	3/2/93	2/2/93	$ 16.00	$ 1.00	40.00	$ 709.80	1/6	5	T42N R75W SEC 35 SWSE
Campbell	51	93-46	State of Wyoming	Kerr-McGee Corporation	3/2/93	2/2/93	$ 26.00	$ 1.00	480.00	$ 13,042.60	1/6	5	T42N R75W SEC 36 N2, SW
Converse	57	93-51	State of Wyoming	Steve A. Tofte	3/2/93	2/2/93	$ 1.00	$ 1.00	240.00	$ 533.80	1/6	5	T33N R76W SEC 21 N2S2, SESW, SWSE
Converse	59	93-52	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 1.00	$ 1.00	39.48	$ 109.74	1/6	5	T41N R76W SEC 2 NWNE
Campbell	60	93-53	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 1.00	$ 1.00	80.00	$ 194.60	1/6	5	T42N R76W SEC 27 NWNW, SEC 32 SWNE
Campbell	67	93-54	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 1.00	$ 1.00	240.00	$ 533.80	1/6	5	T38N R77W SEC 36 W2NW, SW
Johnson	68	93-55	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T43N R77W SEC 16 ALL
Natrona	72	93-61	State of Wyoming	R. K. O'Connell	3/2/93	2/2/93	$ 3.00	$ 1.00	520.00	$ 2,167.40	1/6	5	T37N R78W SEC 36 SWNE, NW, S2
Natrona	73	93-62	State of Wyoming	Yates Petroleum Corporation	3/2/93	2/2/93	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T40N R78W SEC 16 ALL
Natrona	74	93-63	State of Wyoming	Bissell Oil Company	3/2/93	2/2/93	$ 1.00	$ 1.00	20.04	$ 69.40	1/6	5	T39N R79W SEC 4 W2NW
Converse	262	93-190	State of Wyoming	Crawley Petroleum			$ 28.00	$ 1.00	480.00	$ 14,002.60	1/6	5	T38N R75W SEC 36 NE, S2
Campbell	263	93-191	State of Wyoming	Yates Petroleum Corporation			$ 3.00	$ 1.00	80.00	$ 354.60	1/6	5	T41N R75W SEC3 SWSW, SEC 10 NWNW
Campbell	264	93-192	State of Wyoming	Yates Petroleum Corporation			$ 16.00	$ 1.00	80.00	$ 1,394.60	1/6	5	T41N R75W SEC 16 E2SE
Converse	265	93-193	State of Wyoming	High Plains Associates, Inc.			$ 25.00	$ 1.00	120.00	$ 3,159.40	1/6	5	T41N R75W SEC 29 W2SE, SEC 32 NWSW

LIST OF STATE LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Campbell	273	93-201	State of Wyoming	Yates Petroleum Corporation			$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T42N R76W SEC 36 ALL
Campbell	274	93-202	State of Wyoming	Yates Petroleum Corporation			$ 1.00	$ 1.00	480.00	$ 1,042.60	1/6	5	T43N R76W SEC 16 N2, SW
Converse	496	93-353	State of Wyoming	M. John Kennedy	10/2/93	8/1/93	$107.00	$ 1.00	320.00	$ 34,623.40	1/6	5	T40N 75W SEC 36 E2
Converse	512	93-367	State of Wyoming	Marathon Oil Company	10/2/93	8/1/93	$ 60.00	$ 1.00	480.00	$ 29,362.60	1/6	5	T36N R77W SEC 36 N2,SW
Natrona	517	93-370	State of Wyoming	Yates Petroleum Corporation	10/2/93	8/1/93	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T37N R79W SEC 36 NW
Johnson	518	93-371	State of Wyoming	Norma Rose	10/2/93	8/1/93	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T43N R79W SEC 36 ALL
Cambell	702	93-499	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T42N R75W SEC 16 ALL
Cambell	703	93-500	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 7.00	$ 1.00	80.00	$ 674.60	1/6	5	T43N R75W SEC 26 SWSW, SEC 27 SESE
Cambell	704	93-501	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 5.00	$ 1.00	240.00	$ 1,493.80	1/6	5	T43N R75W SEC 34 N2NE, NW
Cambell	705	93-502	State of Wyoming	Flying J Oil & Gas Inc.	12/2/93	10/4/93	$ 12.00	$ 1.00	320.00	$ 4,223.40	1/6	5	T43N R75W SEC 36 S2
Converse	711	93-506	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T37N R76W SEC 16 SW
Converse	712	93-507	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 1.00	$ 1.00	80.00	$ 194.60	1/6	5	T39N R76W SEC 36 E2NW
Johnson	718	93-511	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 1.00	$ 1.00	560.00	$ 1,212.20	1/6	5	T41N R77W SEC 16 NE, N2NW, S2
Natrona	722	93-515	State of Wyoming	Jas O. Breene Jr.	12/2/93	10/4/93	$ 1.00	$ 1.00	360.00	$ 788.20	1/6	5	T34N R78W SEC 16 NE, E2NW, N2SW, SWSW
Natrona	726	93-517	State of Wyoming	Yates Petroleum Corporation	12/2/93	10/4/93	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T35N R79W SEC 36 ALL
Converse	280	94-231	State of Wyoming	Tom E. Swanson	6/2/94	4/5/94	$ 50.00	$ 1.00	80.00	$ 4,114.60	1/6	5	T38N R75W SEC 36 E2NW
Converse	281	94-232	State of Wyoming	Yates Petroleum Corporation	6/2/94	4/5/94	$ 12.00	$ 1.00	400.00	$ 5,273.00	1/6	5	T40N R75W SEC 8 NWSW, NESE, SEC17 S2
Cambell	282	94-233	State of Wyoming	Yates Petroleum Corporation	6/2/94	4/5/94	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T42N R75W SEC 36 SE
Converse	291	94-238	State of Wyoming	Yates Petroleum Corporation	6/2/94	4/5/94	$ 4.00	$ 1.00	480.00	$ 2,482.60	1/6	5	T38N R76W SEC 16 NE, S2

LIST OF STATE LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Converse	302	94-247	State of Wyoming	Yates Petroleum Corporation	6/2/94	4/5/94	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T40N R77W SEC 36 ALL
Converse	458	94-355	State of Wyoming	Yates Petroleum Corporation	10/2/94	8/2/94	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T34N R75W SEC 16 ALL
Converse	460	94-356	State of Wyoming	Yates Petroleum Corporation	10/2/94	8/2/94	$ 1.00	$ 1.00	40.00	$ 109.80	1/6	5	T36N R75W SEC22 SWSW
Converse	462	94-358	State of Wyoming	Hal Writer	10/2/94	8/2/94	$ 24.00	$ 1.00	640.00	$ 16,101.80	1/6	5	T38N 75W SEC 16 ALL
Converse	463	94-359	State of Wyoming	M. John Kennedy	10/2/94	8/2/94	$ 18.00	$ 1.00	80.00	$ 1,554.60	1/6	5	T40N R75W SEC 18 W2SE
Converse	464	94-360	State of Wyoming	Yates Petroleum Corporation	10/2/94	8/2/94	$ 1.00	$ 1.00	40.00	$ 109.80	1/6	5	T41N R75W SEC 31 SESE
Converse	465	94-361	State of Wyoming	Yates Petroleum Corporation	10/2/94	8/2/94	$ 1.00	$ 1.00	560.00	$ 1,212.20	1/6	5	T41N R75W SEC 36 N2, SW, W2SE
Converse	469	94-363	State of Wyoming	Yates Petroleum Corporation	10/2/94	8/2/94	$ 1.00	$ 1.00	80.00	$ 194.60	1/6	5	T39N R76W SEC 36 W2NW
Natrona	474	94-368	State of Wyoming	Burnett Oil Company	10/2/94	8/2/94	$ 1.00	$ 1.00	156.96	$ 357.84	1/6	5	T38N R77W SEC 31 E2SW, NWSE, LOT 4
Natrona	476	94-370	State of Wyoming	Burnett Oil Company	10/2/94	8/2/94	$ 1.00	$ 1.00	240.00	$ 533.80	1/6	5	T38N R78W SEC 36 NE4, E2NW
Campbell	673	94-515	State of Wyoming	Flying J Oil & Gas	12/2/94	10/3/94	$ 13.00	$ 1.00	320.00	$ 4,543.40	1/6	5	T43N R75W SEC 36 N2
Converse	676	94-517	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 1.00	$ 1.00	340.00	$ 745.80	1/6	5	T33N R76W SEC 10 NE, NENW, S2NW, PT. N2SW
Converse	677	94-518	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 20.00	$ 1.00	160.00	$ 3,404.20	1/6	5	T35N R76W SEC 16 SW
Campbell	678	94-519	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 18.00	$ 1.00	640.00	$ 12,261.80	1/6	5	T41N R76W SEC 16 ALL
Campbell	679	94-520	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 22.00	$ 1.00	120.00	$ 2,799.40	1/6	5	T41N R76W SEC 22 E2NE, NWNW
Campbell	680	94-521	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 1.00	$ 1.00	480.00	$ 1,042.60	1/6	5	T42N R76W SEC 16 N2, SE
Campbell	681	94-522	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 26.00	$ 1.00	480.00	$ 13,042.60	1/6	5	T43N R76W SEC 36 NE, S2
Converse	684	94-523	State of Wyoming	Jas O. Breene, Jr.	12/2/94	10/3/94	$ 2.00	$ 1.00	40.00	$ 149.80	1/6	5	T35N R77W SEC 36 NWNW
Natrona	685	94-524	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 2.00	$ 1.00	320.00	$ 1,023.40	1/6	5	T36N R77W SEC 16 E2

LIST OF STATE LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Converse	686	94-525	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 2.00	$ 1.00	640.00	$ 2,021.80	1/6	5	T37N R77W SEC 36 ALL
Johnson	687	94-526	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	12/2/94	10/3/94	$ 7.00	$ 1.00	160.00	$ 1,324.20	1/6	5	T42N R77W SEC 17 SWNE, SENW, NESW, NWSE
Johnson	688	94-527	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	12/2/94	10/3/94	$ 1.00	$ 1.00	40.00	$ 109.80	1/6	5	T42N R77W SEC 32 NENE
Johnson	689	94-528	State of Wyoming	Yates Petroleum Corporation	12/2/94	10/3/94	$ 7.00	$ 1.00	320.00	$ 2,623.40	1/6	5	T42N R77W SEC 36 W2
Johnson	691	94-530	State of Wyoming	R. K. O'Connell	12/2/94	10/3/94	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T42N R78W SEC 36 ALL
Converse	36	95-30	State of Wyoming	Yates Petroleum Corporation	4/2/95	2/1/95	$ 1.00	$ 1.00	480.00	$ 1,042.60	1/6	5	T34N R75W SEC 36 N2, NWSW, SESW, NWSE,SESE
Converse	37	95-31	State of Wyoming	Yates Petroleum Corporation	4/2/95	2/1/95	$ 1.00	$ 1.00	40.00	$ 109.80	1/6	5	T36N R75W SEC 27 NWNW
Converse	43	95-35	State of Wyoming	Yates Petroleum Corporation	4/2/95	2/1/95	$ 1.00	$ 1.00	480.00	$ 1,127.40	1/6	5	T38N R76W SEC 36 NE, S2
Converse	44	95-36	State of Wyoming	Flying J Oil & Gas	4/2/95	2/1/95	$ 8.00	$ 1.00	80.00	$ 754.60	1/6	5	T39N R76W SEC 13 NWNE, SENW
Natrona	46	95-38	State of Wyoming	Yates Petroleum Corporation	4/2/95	2/1/95	$ 1.00	$ 1.00	520.00	$ 1,127.40	1/6	5	T37N R77W SEC 15 N2NE, SWNE, W2, W2SE
Natrona	47	95-39	State of Wyoming	Burnett Oil Company	4/2/95	2/1/95	$ 18.00	$ 1.00	640.00	$ 12,261.80	1/6	5	T38N R77W SEC16 ALL
Johnson	48	95-40	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	4/2/95	2/1/95	$ 13.00	$ 1.00	640.00	$ 9,061.80	1/6	5	T42N R77W SEC 16 ALL
Johnson	49	95-41	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	4/2/95	2/1/95	$ 1.00	$ 1.00	160.00	$ 324.20	1/6	5	T42N R77W SEC 33 W2W2
Natrona	54	95-45	State of Wyoming	Winona Oil Company	4/2/95	2/1/95	$ 1.00	$ 1.00	280.00	$ 618.60	1/6	5	T34N R78W SEC 16 W2NW, SESW, SE
Johnson	55	95-46	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	4/2/95	2/1/95	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T43N R78W SEC 16 ALL
Johnson	62	95-51	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	4/2/95	2/1/95	$ 1.00	$ 1.00	360.00	$ 788.20	1/6	5	T43N R79W SEC 11 SE, SEC 13 NWSW, SEC 14 NE

LIST OF STATE LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Convese	237	95-158	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 12.00	$ 1.00	160.00	$ 2,124.20	1/6	5	T37N R75W SEC 36 SW
Convese	238	95-159	State of Wyoming	LCM, LTD., LLC	6/2/95	3/31/95	$ 7.00	$ 1.00	40.00	$ 349.80	1/6	5	T39N R75W SEC 7 SESW
Convese	239	95-160	State of Wyoming	LCM, LTD., LLC	6/2/95	3/31/95	$ 11.00	$ 1.00	480.00	$ 5,842.60	1/6	5	T39N R75W SEC 36 NE, S2
Convese	240	95-161	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 14.00	$ 1.00	543.08	$ 8,250.17	1/6	5	T40N R75W SEC 18 N2, SW, E2SE
Convese	242	95-163	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 5.00	$ 1.00	640.00	$ 3,941.80	1/6	5	T35N R76W SEC 36 ALL
Convese	243	95-164	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 1.00	$ 1.00	40.00	$ 109.80	1/6	5	T39N R76W SEC 25 NESW
Convese	244	95-165	State of Wyoming	Intrepid Production Corporation	6/2/95	3/31/95	$ 17.00	$ 1.00	360.00	$ 6,548.20	1/6	5	T40N R76W SEC 12 SENW, S2
Convese	245	95-166	State of Wyoming	Intrepid Production Corporation	6/2/95	3/31/95	$ 17.00	$ 1.00	640.00	$ 11,621.80	1/6	5	T40N R76W SEC 13 ALL
Johnson	246	95-167	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 1.00	$ 1.00	80.00	$ 194.60	1/6	5	T41N R76W SEC 8 W2NW
Cambell	247	95-168	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 1.00	$ 1.00	40.00	$ 109.80	1/6	5	T41N R76W SEC 17 SESE
Cambell	248	95-169	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T43N R76W SEC 16 SE
Converse	252	95-173	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 5.00	$ 1.00	320.00	$ 1,983.40	1/6	5	T38N R77W SEC 36 E2
Natrona	253	95-174	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 24.00	$ 1.00	440.00	$ 11,077.80	1/6	5	T40N R77W SEC 16 SWNE, W2, E2SE
Converse	254	95-175	State of Wyoming	Yates Petroleum Corporation	6/2/95	3/31/95	$ 1.00	$ 1.00	320.00	$ 703.40	1/6	5	T41N R77W SEC 36 W2
Johnson	273	95-188	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	6/2/95	3/31/95	$ 1.00	$ 1.00	320.00	$ 703.40	1/6	5	T43N R79W SEC 16 W2
Johnson	274	95-189	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	6/2/95	3/31/95	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T43N R79W SEC 21 SESE, SEC 28 N2NE, SWNE
Converse	459	95-301	State of Wyoming	Vastar Resources, Inc.	10/2/95	8/1/95	$ 12.00	$ 1.00	80.00	$ 1,074.60	1/6	5	T39N R75W SEC 6 NESE, SEC 7 NESW
Converse	460	95-302	State of Wyoming	Vastar Resources, Inc.	10/2/95	8/1/95	$ 12.00	$ 1.00	640.00	$ 8,421.80	1/6	5	T39N R75W SEC 16 ALL

LIST OF STATE LEASE SALES IN THE POWDER RIVER BASIN, WYOMING

Converse	465	95-304	State of Wyoming	Yates Petroleum Corporation	10/2/95	8/1/95	$ 2.00	$ 1.00	160.00	$ 524.20	1/6	5	T38N R76W SEC 16 NW
Converse	466	95-305	State of Wyoming	Yates Petroleum Corporation	10/2/95	8/1/95	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T38N R76W SEC 36 NW
Converse	467	95-306	State of Wyoming	Yates Petroleum Corporation	10/2/95	8/1/95	$ 1.00	$ 1.00	80.00	$ 194.60	1/6	5	T39N R76W SEC 16 E2SE
Converse	468	95-307	State of Wyoming	John R. Shaw	10/2/95	8/1/95	$ 12.00	$ 1.00	40.00	$ 549.80	1/6	5	T40N R76W SEC 14 SESW
Converse	475	95-310	State of Wyoming	Arch W. Deuel	10/2/95	8/1/95	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T33N R77W SEC 36 ALL
Natrona	476	95-311	State of Wyoming	Arch W. Deuel	10/2/95	8/1/95	$ 16.00	$ 1.00	40.00	$ 709.80	1/6	5	T39N R77W SEC 19 NESW
Natrona	477	95-312	State of Wyoming	Yates Petroleum Corporation	10/2/95	8/1/95	$ 1.00	$ 1.00	200.00	$ 449.00	1/6	5	T40N R77W SEC 16 N2NE, SENE, W2SE
Natrona	485	95-316	State of Wyoming	Norma Rose	10/2/95	8/1/95	$ 1.00	$ 1.00	320.00	$ 703.40	1/6	5	T38N R78W SEC 36 S2
Johnson	491	95-317	State of Wyoming	Hanson & Strahn Energy Land Services, Inc.	10/2/95	8/1/95	$ 1.00	$ 1.00	320.00	$ 703.40	1/6	5	T43N R79W SEC 16 E2
Converse	651	95-424	State of Wyoming	James F. Clark	10/5/95	12/2/95	$ 16.00	$ 1.00	640.00	$ 10,981.80	1/6	5	T37N R75W SEC 16 ALL
Converse	652	95-425	State of Wyoming	Yates Petroleum Corporation	10/5/95	12/2/95	$ 12.00	$ 1.00	480.00	$ 6,322.60	1/6	5	T37N R75W SEC 36 N2, SE
Natrona	661	95-428	State of Wyoming	Yates Petroleum Corporation	10/5/95	12/2/95	$ 1.00	$ 1.00	320.00	$ 703.40	1/6	5	T36N R77W SEC 16 W2
Converse	662	95-429	State of Wyoming	Yates Petroleum Corporation	10/5/95	12/2/95	$ 1.00	$ 1.00	80.00	$ 194.60	1/6	5	T38N R77W SEC 36 E2NW
Natrona	664	95-430	State of Wyoming	Yates Petroleum Corporation	10/5/95	12/2/95	$ 1.00	$ 1.00	640.00	$ 1,381.80	1/6	5	T41N R78W SEC 36 ALL
Converse	48	96-37	State of Wyoming	Yates Petroleum Corporation	4/2/96	2/2/96	$ 1.00	$ 1.00	120.00	$ 279.40	1/6	5	T35N R75W SEC 25 E2NE, NESE
Converse	49	96-38	State of Wyoming	Yates Petroleum Corporation	4/2/96	2/2/96	$ 1.00	$ 1.00	360.00	$ 788.20	1/6	5	T35N R75W SEC 36 W2,SWSE
Converse	57	96-41	State of Wyoming	Stanley H. Spalding	4/2/96	2/2/96	$ 1.00	$ 1.00	160.00	$ 364.20	1/6	5	T35N R77W SEC 36 S2S2
Johnson	59	96-42	State of Wyoming	Yates Petroleum Corporation	4/2/96	2/2/96	$ 1.00	$ 1.00	320.00	$ 703.40	1/6	5	T42N R77W SEC 36 E2

APPENDIX G

LIST OF ASSIGNMENTS AND BILLS OF SALES

LIST OF ASSIGNMENTS AND BILLS OF SALE ON PRODUCING PROPERTIES IN THE POWDER RIVER BASIN, WYOMING

NATRONA COUNTY

Inst. #	Assignor	Assignee	Eff. Date	Rec. Date	Type of Instrument	Description	Gross Acres	Net Acres	ORRI Conv.	NRI	Amount Paid	Field Name	Relative to NPR3
544444	Pegusus Inc.	Kachina Exploration Inc.	9/2/96	6/1/94	Lease Interest Assignment	T35N R77W	300.00		0.00%			Coal Creek	18mi S.
544445	Pegusus Inc.	Kachina Exploration Inc.	5/31/94	6/1/94	Assignment, Bill of Sale	T35N R77W				80.00%		Coal Creek	18mi S.
544447	Pegusus Inc.	Kachina Exploration Inc.		6/1/94	Transfer of Operating Rights	T35N R77W SEC 21						Coal Creek	18mi S.
544448	Pegusus Inc.	Kachina Exploration Inc.		6/1/94	Transfer of Operating Rights	T35N R77W SEC 21						Coal Creek	18mi S.
544449	Pegusus Inc.	Kachina Exploration Inc.	6/1/94	6/1/94	Transfer of Operating Rights	T35N R77W						Coal Creek	18mi S.
544970	John R. Murrish Trust	Amoco Prod. Co.	3/1/94	6/8/94	Assignment and Bill of Sale	T39N R78-79W T40N R78-79W	16,000.00				$ 1,200.00	Teapot, Salt Ck.	w/in 5 miles
545082	Antelope Production Company	Petroleum, INC.	5/1/94	6/10/94	Conveyance, Bill of Sale. Trasfer of Operating Rights,	T37N 78W	800.00		7.84%	51.56%		Burke Ranch, E	8 mi. south
545088	WHAM	Sable Energy	1/1/94	6/10/94	Assignment and Bill of Sale	T33N R77W SEC 16 SW, SEC 17 NESE	200.00				$ 10.00	Brooks Prod	30 mi.
546565	Conoco Inc.	Anadarko Minerals, Inc.	1/1/94	7/5/94	Assignment and Bill of Sale	T39N R78W T40N R78-79W	280		.0038% oil .0148% gas		$1 million(?)	Salt Ck Lt. Oil Unit	8 mi. north
546722	Pegusus Inc.	Kachina Exploration Inc.	6/1/94	8/8/94	Assignment and Bill of Sale	T35N R77W					$ 10.00	Coal Creek	18mi S.
546752	JK. Minerals Inc.	Kachina Exploration Inc.	7/1/94	8/8/94	Assignment and Bill of Sale	T35N R77W SEC 21 SWNE	40.00			8.00%	$ 10.00	Cole Creek	18 mi S.
547918	G.G. Nicolaysen Jr.and Adrienne T. Bonnet	Kachina Exploration Inc.	8/29/94	8/1/94	Assignment, Bill of Sale	T35N R77W SEC 16, 28	120.00				$ 10.00	Coal Creek	18mi S.
549708	Conoco Inc.	Anadarko Minerals, Inc.	1/1/94	9/1/94	Assignment and Bill of Sale	T39N R78W T40N R78W	720		0.01%	3.37%		Salt Ck Lt. Oil Unit	8 mi. north
553689	Kachina Exploration	Burnett Oil Co.		11/22/94	Trasfer of Operating Rights	T35N R77W SEC 3	80.00			43.20%		Cole Creek	18 mi S.
553691	Kachina Exploration	Burnett Oil Co.		11/22/94	Lease Interest Assignment	T35N R777W SEC 16	40.00		0.24%	48.25%		Cole Creek	18 mi SE.
553692	G.G. and Adrienne B. Nicolaysen	Kachina Exploration Inc.	10/1/94	11/22/94	Assignment, Bill of Sale	T35N R77W SEC 28 NENW	80.00				$ 10.00	Coal Creek	18mi S.

LIST OF ASSIGNMENTS AND BILLS OF SALE ON PRODUCING PROPERTIES IN THE POWDER RIVER BASIN, WYOMING

553693	G.G. and Adrienne B. Nicolaysen	Kachina Exploration Inc.	11/1/94	11/22/94	Assignment, Bill of Sale	T35N R77W					$ 10.00	Coal Creek	18mi S.
553694	JK Minerals Inc.	Kachina Exploration Inc.	11/18/94	11/22/94	Assignment, Bill of Sale	T35N R77W					$ 10.00	Coal Creek	18mi S.
553695	Pegasus Inc.	Kachina Exploration Inc.	11/18/94	11/23/94	Assignment, Bill of Sale	(same properties as # 553695)					$ 10.00	Coal Creek	18mi S.
554700	Philip Gates	McMurry Oil Co.	10/1/94	12/15/94	Assignment of Working Interest	T39-40N R78-79W	14,800.00	12.00		0.08%	$ 10.00	Salt Ck.Unit	10 mi. north
554847	William H. Carpenter	Neward Corporation		12/19/94	Quitclaim Assignment	T37N R77W SEC 19 SWSW	80.00				$ 500.00	Sage Spring Creek	18mi S.
555149	Equitable Resources Energy Company	Karen Ralston Slade	12/31/94	12/27/94	Assignment, Bill of Sale and Conveyance	T33N R77W	320.00				$5,000,000.00	Brooks Ranch	30mi S.
555399	Henry H. Sillman	Denis J. Bowles	1/3/95	1/3/95	Deed and Assignment of Overiding Royalty	T36N R77W T37N R77-78W	1,845.79				$ 10.00	Sage Spring Creek	8mi S.
555694	Stan A. Cadwell & Melody R. Holm	Elaine Allred		1/11/95	Assignment, Bill of Sale and Conveyance	T37N R78-79W T38N R78-79W						Twenty Mile Hill	10mi
556294	Marathon Oil Company	DNR Oil & Gas Inc.	1/9/95	1/25/95	Quitclaim Assignment and Bill of Sale	T38N R76-78W	1,280.00				$ 10.00		8mi E.
556684	JK Minerals	James F. Clarke	12/21/94	2/3/95	Assignment of Overiding Royalty	T35N R77W	80.00		92.70%		$ 10.00	Coal Creek	18mi S.
557564	JK Minerals	Gene R, George	12/21/94	2/29/95	Assignment of Overiding Royalty	(same property as 556684)	80.00		92.70%		$ 10.00	Coal Creek	18mi S.
558864	R.L. Fawcett	Metro Minerals	12/1/94	3/31/95	Assignment of Leases	T37N 79W SEC 36					$ 10.00	Twenty Mile Hill	10mi
559165	Kachina Exploration	Dakota Development Co.	4/5/95	4/6/95	Assignment and Bill of Sale	T35N R77W	240.00			80.00%	$ 10.00	Cole Creek	18mi SE
559166	Kachina Exploration	Kaycee Minerals Inc.	4/6/95	4/9/95	Assignment and Bill of Sale	T35N R77W	240.00				$ 10.00	Cole Creek	18mi SE
559381	Kachina Exploration	Dakota Development Co.	4/11/95	4/12/95	Assignment and Bill of Sale	T35N R77W	120.00			80.00%	$ 10.00	Cole Creek	18mi SE
560798	Dakota Development Co.	Kachina Exploration	5/1/96	5/12/95	Assignment and Bill of Sale	T35N R77W	120.00			180.00%	$ 10.00	Cole Creek	18mi SE
560799	Kaycee Minerals Inc	Kachina Exploration	5/11/95	5/12/95	Assignment and Bill of Sale	(same as # 559166)	240.00				$ 10.00	Cole Creek	18mi SE
560797	Dakota Development Co.	Kachina Exploration	5/11/95	5/12/95	Assignment and Bill of Sale	(same as 559165)	240.00			80.00%	$ 10.00	Cole Creek	18mi SE

LIST OF ASSIGNMENTS AND BILLS OF SALE ON PRODUCING PROPERTIES IN THE POWDER RIVER BASIN, WYOMING

564429	Estate of Emanual M. Josephson	George G. Vaught, Jr. (1/3) McCulliss Resources Co Inc. (1/3) Steven G Shaddock (1/3)	4/1/95	7/24/95	Assignment, Bill of Sale and Conveyance	T39N R78W T40N R78-79W	16,500.00			Hunt S. .2506% Amoco S. .0218%	$ 10.00	Salt Creek	8mi
567517	Olive Oil, LC	States, Inc.	8/1/95	9/22/95	Assignment and Bill of Sale	T32N R85W T37N R78W	1,880.00				$ 10.00	Burke Ranch, E	8 mi. south
568333	Whiting Petroleum Corp.	Loin Energy Corp.	9/1/95	10/9/95	Assignment, Bill of Sale and Conveyance	T34N R78W SEC 13	120.00				$ 10.00	Coal Creek	18mi
569650	CENEX, Inc,	Big West Oil & Gas Inc., Owner	6/1/95	11/6/95	Assignment and Bill of Sale	T33-38N R76-88W					$ 100.00		
569752	Manning Oil	Timberline Production	10/1/95	11/7/95	Assignment, Bill of Sale and Conveyance	T33N R77W					$ 100.00	Brooks Ranch	30mi S.
570178	Estate of Alice R. Rea	McMurry Oil Company	10/25/95	11/14/95	Assignment, Bill of Sale and Conveyance	T40N R79W T37N R78W						Burke Ranch	6 mi N &S.
570928	Kelly Dunham	Loin Energy Corp	10/1/95	11/30/95	Assignment, Bill of Sale and Conveyance	T34N R78W	80.00				$ 10.00	Soda Lake	
571471	American Exploration Drlg Prog.	Fancher Oil Co.	11/1/95	12/12/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 13, 14, 24	1,240.00				$ 10.00	Sage Spng. Ck.	7 mi. south
571472	Hamon Operating Co.	Fancher Oil Co.	11/1/95	12/12/95	Assignment and Bill of Sale	T37N R78W					$ 10.00	Sage Spng. Ck.	7 mi. south
572279	Montex Expl. Co.	O'Neal Resources Corp.		12/29/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 13, 14, 24	1,240.00				$ 10.00	Sage Spng. Ck.	7 mi. south
572280	Harvard Expl. Ltd.	O'Neal Resources Corp.		12/29/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 13, 14, 24	1,240.00				$ 10.00	Sage Spng. Ck.	7 mi. south
572927	Boatmen's Bank	R. Jones	7/1/95	1/16/96	Assignment, Conveyance, Bill of Sale	T40N R78W SEC 30	40.00				$ 10.00	Salt Ck It.Oil Unit	8mi. NW
574757	O'Neal Resources Corp.	Conley P. Smith	12/1/95	12/29/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 13, 14, 24	1,440.00				$ 10.00	Sage Spng. Ck.	7-8 mi. south
574758	O'Neal Resources Corp.	Mountain Petr.Corp.	1/1/96	2/22/96	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 24	840.00				$ 10.00	Sage Spng. Ck.	7 mi. south
575113	Timberline Production Co.	Carol Holly Oil Corp.		2/29/96	Trasfer of Operating Rights	T34N R78W SEC 13 SESW,SWSW	80.00					Soda Lake	18 mi S.

LIST OF ASSIGNMENTS AND BILLS OF SALE ON PRODUCING PROPERTIES IN THE POWDER RIVER BASIN, WYOMING

575823	Sable Energy, LTD	Timberline Production Co.	3/1/96	3/15/96	Assignment, Bill of Sale	T33N R77W SEC 16 SW, SEC 17 NESE	200.00					Brooks Ranch	30 mi S.
577157	Jewell Mitchell Trusts	States, Inc.	2/1/96	4/15/96	Assignment	T37N R78W SEC 15, 16, 17, 20, 21, 22	1,560.00			1.52%	$ 10.00	E Burke Ranch	7mi. south
578222	Petro Eagle L.C.	Timberline Production		5/6/96	Assignment, Bill of Sale	T33N R77W	960.00					Brooks Ranch	30mi S.
	McMurry Oil Company	Leonard A. Willliams	9/1/95	11/7/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 8 SE SE				0.00%			
	Amoco Production Company	Chapman Oil Company	12/1/95	3/5/96	Bill of Sale, Assignment of Contracual Rights	T41N R79W SEC 36 SE SE				0.00%	$ 10.00		
	JK Minerals	Kachina Exploration, Inc.	7/1/94	7/8/94	Assignment and Bill of Sale	T35N R77W SEC 9 NE/4 NW/4				34.22%	$ 10.00	Sage Spring Creek	8mi SE
	Conoco Inc.	Westport Oil & Gas Co. Inc.	1/6/95	6/7/95	Assignment and Bill of Sale					0.00%			
	Conoco Inc.	Whiting Petroleum Corporation								0.00%			
	Cenex	MCM Oil & Gas	10/1/94	3/27/95	Assignment, Conveyance, Bill of Sale	T37N R77W SEC 19					$100.00		
	Burnett Oil Co.	Gries/Hayes	4/25/94	11/3/94	Assignment of ORRI	T37N R78W SEC 27, 33, 35	560.00		4.00%			Burke Ranch, E	10 mi. south
	Yates Pet. Corp.	Yates Drlg. Co.	4/26/95	5/15/95	Assignment of Oil and Gas Leases	T37N R77W SEC 22, 27	560.00					Sage Spng. Ck.	8 mi. south
	Lillie Costanzo Trustee	Petroleum Inc.	2/1/95	4/27/95	Assignment of Oil and Gas Leases	T37N R78W SEC 15, 16, 22	240.00					Sage Spng. Ck.	9 mi. south
	E.Josephson	McCulliss Resources., et al	4/1/95	7/24/95	Assignment, Conveyance, Bill of Sale	T39-40N R78-79W	16640+			0.25%		Salt Ck Lt. Oil Unit	8 mi. north
	MCM Oil & Gas LLC	Silver Plume Energy LLC	10/1/94	8/21/95	Assignment, Conveyance, Bill of Sale	T37N R77W SEC 19	40.00				$ 100.00	Sage Spng. Ck.	10 mi. SE
	George Vaught, Jr. et al.	Leonard Williams	9/1/95	11/7/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 8,9	160.00					Burke Ranch, E	8 mi. south
	US West	RT Communications		2/8/95	Assignment	various							

LIST OF ASSIGNMENTS AND BILLS OF SALE ON PRODUCING PROPERTIES IN THE POWDER RIVER BASIN, WYOMING

CONVERSE COUNTY

776911	Conoco	Mystique	10/1/92	3/30/93	Assignment, Bill of Sale	T33N R74-76W						Glenrock	30mi S.
776912	Mystique	Whiting Petroleum (60%) Alfa Resources Inc. (3%) Meteor Developments Inc.(11%) S. Glenrock Limited Liability (14%)	10/1/92	3/30/93	Assignment, Bill of Sale	T33N R74-76W					$ 10.00	Glenrock	30mi S.
	McMurry Oil Company	Leonard A. Willliams	9/1/95	11/7/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 8 SE SE				0.00%			
	Amoco Production Company	Chapman Oil Company	12/1/95	3/5/96	Bill of Sale, Assignment of Contracual Rights	T41N R79W SEC 36 SE SE				0.00%	$ 10.00		
	JK Minerals	Kachina Exploration, Inc.	7/1/94	7/8/94	Assignment and Bill of Sale	T35N R77W SEC 9 NE/4 NW/4				34.22%	$ 10.00	Sage Spring Creek	8mi SE
	Conoco Inc.	Westport Oil & Gas Co. Inc.	1/6/95	6/7/95	Assignment and Bill of Sale					0.00%			
	Conoco Inc.	Whiting Petroleum Corporation								0.00%			
	Cenex	MCM Oil & Gas	10/1/94	3/27/95	Assignment, Conveyance, Bill of Sale	T37N R77W SEC 19					$100.00		
	Burnett Oil Co.	Gries/Hayes	4/25/94	11/3/94	Assignment of ORRI	T37N R78W SEC 27, 33, 35	560.00		4.00%			Burke Ranch, E	10 mi. south
	Yates Pet. Corp.	Yates Drlg. Co.	4/26/95	5/15/95	Assignment of Oil and Gas Leases	T37N R77W SEC 22, 27	560.00					Sage Spng. Ck.	8 mi. south
	Lillie Costanzo Trustee	Petroleum Inc.	2/1/95	4/27/95	Assignment of Oil and Gas Leases	T37N R78W SEC 15, 16, 22	240.00					Sage Spng. Ck.	9 mi. south
	E.Josephson	McCulliss Resources., et al	4/1/95	7/24/95	Assignment, Conveyance, Bill of Sale	T39-40N R78-79W	16640+			0.25%		Salt Ck Lt. Oil Unit	8 mi. north
	MCM Oil & Gas LLC	Silver Plume Energy LLC	10/1/94	8/21/95	Assignment, Conveyance, Bill of Sale	T37N R77W SEC 19	40.00				$ 100.00	Sage Spng. Ck.	10 mi. SE

LIST OF ASSIGNMENTS AND BILLS OF SALE ON PRODUCING PROPERTIES IN THE POWDER RIVER BASIN, WYOMING

	George Vaught, Jr. et al.	Leonard Williams	9/1/95	11/7/95	Assignment, Conveyance, Bill of Sale	T37N R78W SEC 8,9	160.00					Burke Ranch, E	8 mi. south
	US West	RT Communications		2/8/95	Assignment	various							

APPENDIX H

LIST OF MINERAL CONVEYANCES
EASTERN WYOMING

APPENDIX H
LIST OF MINERAL CONVEYANCES

Grantor	Grantee	Execution Date	Recording Date	Type of Instrument	Interest Conveyed	Description	Amount Paid
Sillman, Henry H.	Bowels, Dennis J.	11/30/94	1/3/95	Deed	100%	T36N R77W SEC 6 T37N R78W SEC 25,36 T37N R77W SEC 19,29,30,31,32	N/A
Mallory, Barbara A.	Norwest Bank WY NA Trustee Ohlsen Trust	4/19/95	4/27/95	Deed	100% of 1/6	T36N R77W SEC 6 T37N R78W SEC 1,11,12,25,36	N/A
First Interstate Bank of CA Trustee Et al., Walter B Marriott 1980 Trust Et Al.	Marriott, Walter B Jr. Et Al Hamm, Barbara Marriott Et Al.	3/19/96	3/25/96	Deed	100%	T37N R77W SEC 30, LOT 1, NE/4, NW/4	N/A
Bank of Oklahoma NA Trustee Lee, Atha F Trust	Zimmerman, Rober E	10/1/95	2/2/96	Deed	100%	T39N R78W SEC 5	N/A
Norwest Bank WY NA as Personal Rep.	Macnerney, Kathleen Et Al. Wilkinson, Frances Et Al.	9/21/95	9/27/95	Deed	2/3	T40N R79W SEC 32 E/2, SEC 33 NW/4	N/A
Norwest Bank WY NA as Personal Rep.	O'Connor, James P Et Al Ring, Miriam Et Al	9/21/95	9/27/95	Deed	1/3	T40N R79W SEC 32 E/2, SEC 33 NW/5	N/A
Chevron USA Inc.	Termo CO The	12/2/94	9/5/95	Quitclaim Mineral Deed	100%		N/A

APPENDIX I

SURFACE APPRAISAL REPORT

SUMMARY REPORT OF A LIMITED APPRAISAL OF THE U. S. NAVAL PETROLEUM RESERVE #3 LOCATED IN NATRONA COUNTY, WYOMING

Prepared For
Mr. John B. Gustavson, President
Gustavson Associates
Boulder, Colorado

Effective Date of Appraisal

July 27, 1996

Prepared By

JAMES E. WREN, SRA, SRPA
CERTIFIED GENERAL REAL ESTATE APPRAISER

JAMES E. WREN COMPANY
Real Estate Appraisers and Consultants
341 East "E" Street
Suite 260
Casper, Wyoming 82601
(307) 266-2610

August 9, 1996

Mr. John B. Gustavson, President
Gustavson Associates
Geologists and Engineers
5757 Central Avenue, Suite "D"
Boulder, Colorado 80301

Dear Mr. Gustavson:

Pursuant to your request, I have prepared a limited appraisal, delivered in the accompanying summary report form, of the surface value of the property known as the U. S. Naval Petroleum Reserve No. 3 located in Natrona County, Wyoming, and herein referred to as the "subject property".

The accompanying Limited Appraisal, Summary Report which is intended to comply with the reporting requirements set forth under Standards Rule 2-2(b) of the Uniform Standards of Professional Appraisal Practice for a Summary Appraisal Report. As such, it presents only summary discussions of the data, reasoning, and analyses that were used in the appraisal process to develop the appraiser's opinion of value. Supporting documentation concerning the data, reasoning, and analyses is retained in the appraiser's file. The depth of discussion contained in this report is specific to the needs of the client and for the intended use stated below. The appraiser is not responsible for unauthorized use of this report.

Furthermore, in accordance with prior agreement between the client and the appraiser, this report is the result of a limited appraisal process in that certain allowable departures from specific guidelines of the Uniform Standards of Professional Appraisal Practice were invoked. The value of the oil reserves, mineral rights, and all structural improvements and equipment utilized for the purpose of the operation of NPR-3 is excluded. The intended user of this report is warned that the reliability of the value conclusion provided may be impacted to the degree there is departure from specific guidelines of U.S.P.A.P.

I certify that I have experience in appraising properties similar to the subject of this report. I further certify that I am currently certified as a "Certified General Appraiser" by the State of Wyoming Appraisal Board, whose laws and regulations comply with Title XI of the Federal Financial Institutions Reforms, Recovery, and Enforcement Act of 1989 and hold Wyoming Certified General Appraiser Permit No. 15.

The accompanying report is based on an on-site inspection of the subject property, investigation of the subject neighborhood area of influence, and a review of comparable sales and present listings of comparable properties. Under the departure provision of U.S.P.A.P., the Cost Approach and the Income Approach were not analyzed or considered.

James E. Wren, SRA, SRPA

This appraisal report includes the Letter of Transmittal, Title Page, Narrative Appraisal Report, Plat Map, subject and comparable sale photographs, comparable map, and contingent and limiting conditions.

Based on my completed appraisal analysis, the contents of which are contained in the ensuing report (two copies with original signatures are enclosed), and contingent upon the certification and limiting conditions attached, the "as is" market value of the surface rights of the subject property as of July 27, 1996, is estimated to be:

SIX HUNDRED NINETY NINE THOUSAND DOLLARS

$699,000

Respectfully submitted,

James E. Wren

James E. Wren, SRA, SRPA
Certified General Appraiser #15

JEW/njg

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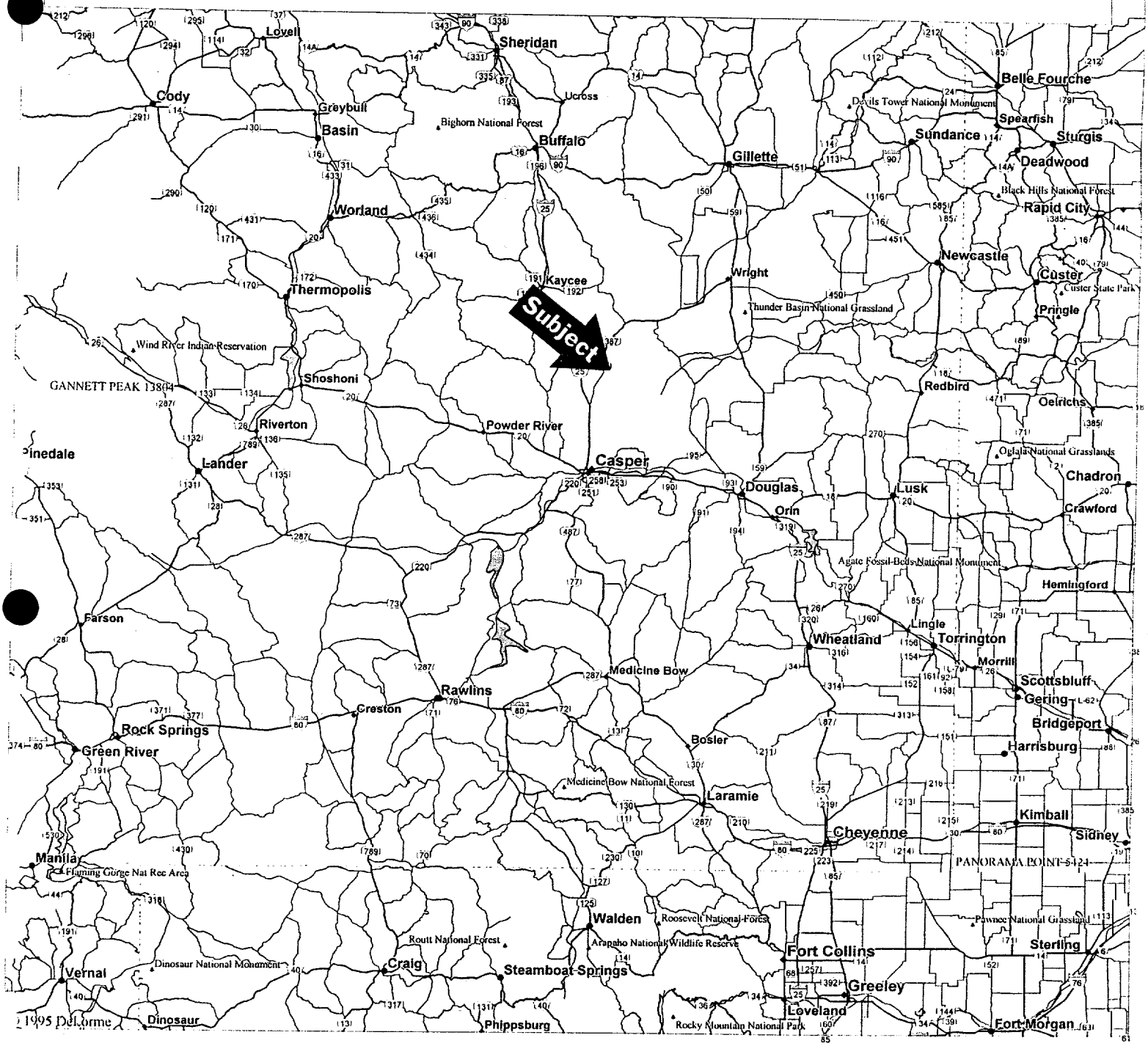
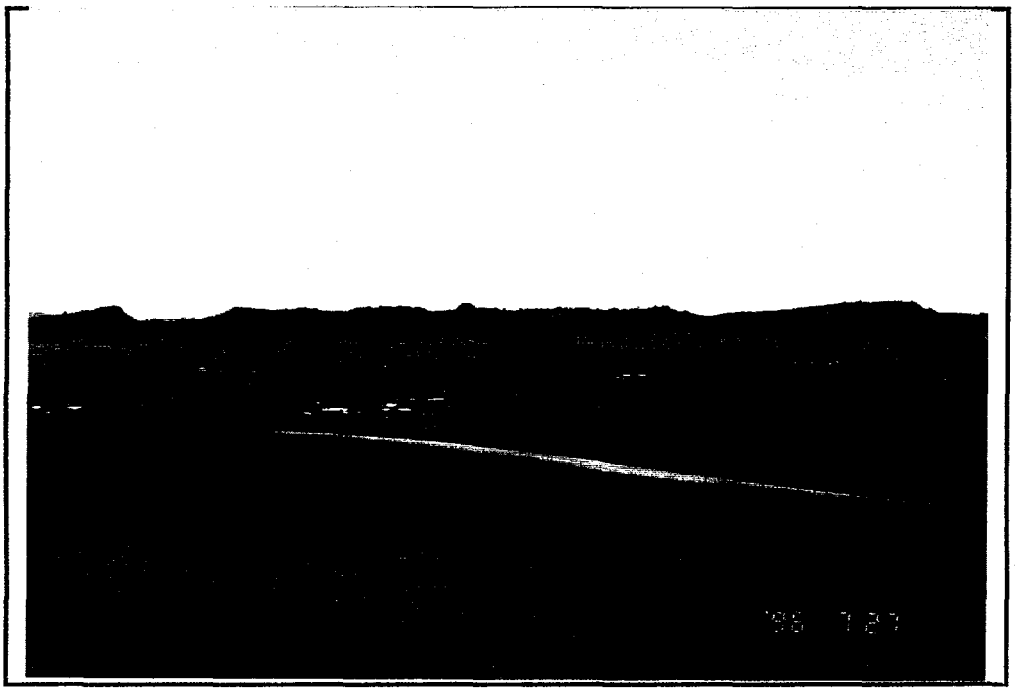
LOCATION MAP

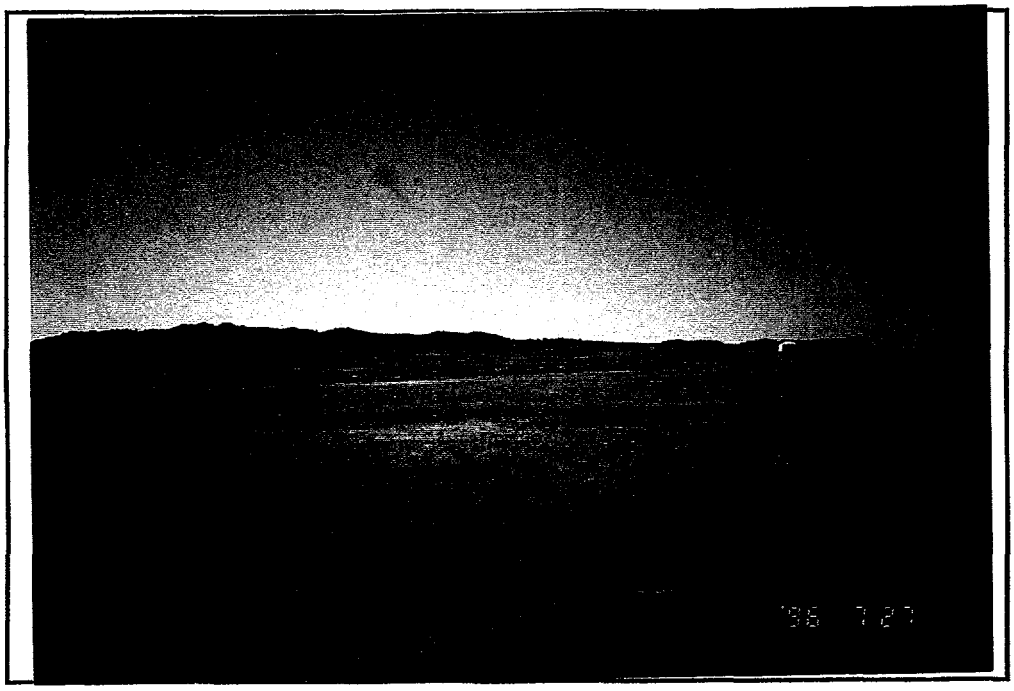


James E. Wren Company

SUBJECT PROPERTY



LOOKING NORTHEAST FROM THE NORTHWEST CORNER OF SECTION 2



LOOKING SOUTHEAST FROM ENTRY

James E. Wren Company

SUBJECT PROPERTY

LOOKING NORTHEAST FROM ENTRY

LOOKING EAST FROM ENTRY

ASSUMPTIONS AND LIMITING CONDITIONS:

1. As agreed upon with the client prior to the preparation of this appraisal, this is a Limited Appraisal because it invokes the Departure Provision of the Uniform Standards of Professional Appraisal Practice. As such, information pertinent to the valuation has not been considered and/or the full valuation process has not been applied. Depending on the type and degree of limitations, the reliability of the value conclusion provided herein may be reduced.

2. This is a Summary Appraisal Report which is intended to comply with the reporting requirements set forth under Standard Rule 2-2(b) of the Uniform Standards of Professional Appraisal Practice for a Summary Appraisal Report. As such, it might not include full discussions of the data, reasoning, and analyses that were used in the appraisal process to develop the appraiser's opinion of value. Supporting documentation concerning the data, reasoning, and analyses is retained in the appraiser's file. The information contained in this report is specific to the needs of the client and for the intended use stated in this report. The appraiser is not responsible for unauthorized use of this report.

3. No responsibility is assumed for legal or title consideration. Title to the property is assumed to be good and marketable unless otherwise stated in this report.

4. The property is appraised free and clear of any or all liens and encumbrances unless otherwise stated in this report.

5. Responsible ownership and competent property management are assumed unless otherwise stated in this report.

6. The information furnished by others is believed to be reliable. However, no warranty is given for its accuracy.

7. All engineering is assumed to be correct. Any plot plans and illustrative material in this report are included only to assist the reader in visualizing the property.

8. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for arranging for engineering studies that may be required to discover them.

9. It is assumed that there is full compliance with all applicable federal, state, and local environmental regulations and laws unless otherwise stated in this report.

10. It is assumed that all applicable zoning and use regulations and restrictions have been complied with, unless a nonconformity has been stated, defined, and considered in this appraisal report.

11. It is assumed that all required licenses, certificates of occupancy or other legislative or administrative authority from any local, state, or national governmental or private entity or organization have been or can be obtained or renewed for any use on which the value estimates contained in this report are based.

12. Any sketch in this report may show approximate dimensions and is included to assist the reader in visualizing the property. Maps and exhibits found in this report are provided for reader reference purposes only. No guarantee as to accuracy is expressed or implied unless otherwise stated in this report. No survey has been made for the purpose of this report.

13. It is assumed that the utilization of the land and improvements is within the boundaries or property lines of the property described and that there is no encroachment or trespass unless otherwise stated in this report.

14. The appraiser is not qualified to detect hazardous waste and/or toxic materials. Any comment by the appraiser that might suggest the possibility of the presence of such substances should not be taken as confirmation of the presence of hazardous waste and/or toxic materials. Such determination would require investigation by a qualified expert in the field of environmental assessment. The presence of substances such as asbestos, urea-formaldehyde foam insulation, or other potentially hazardous materials may affect the value of the property. The appraiser's value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value unless otherwise stated in this report. No responsibility is assumed for any environmental conditions, or for any expertise or engineering knowledge required to discover them. The appraiser's descriptions and resulting comments are the result of the routine observations made during the appraisal process.

15. Unless otherwise stated in this report, the subject property is appraised without a specific compliance survey having been conducted to determine if the property is or is not in conformance with the requirements of the Americans with Disabilities Act. The presence of architectural and communications barriers that are structural in nature that would restrict access by disabled individuals may adversely affect the property's value, marketability, or utility.

16. Any proposed improvements are assumed to be completed in a good workmanlike manner in accordance with the submitted plans and specifications.

17. The distribution, if any, of the total valuation in this report between land and improvements applies only under the stated program of utilization. The separate allocations for land and buildings must nut be used in conjunction with any other appraisal and are invalid if so used.

18. Possession of this report, or a copy thereof, does not carry with it the right of publication. It may not be used for any purpose by any person other than the party to whom it is addressed without the written consent of the appraiser, and in any event, only with proper written qualification and only in its entirety.

19. Neither all nor any part of the contents of this report (especially any conclusions as to value, the identity of the appraiser, or the firm with which the appraiser is connected) shall be disseminated to the public through advertising, public relations, news sales, or other media without prior written consent and approval of the appraiser.

SUMMARY OF SALIENT FACTS AND CONCLUSIONS

Identification of the Subject Property:	The U. S. Naval Petroleum Reserve #3 located in Natrona County, Wyoming
Legal Description:	Parts of Sections 2, 3, 4, 9, 10, 11, 14, 15, 22, 23, and 26, Township 38 North, Range 78 West, 6th P.M., Natrona County, Wyoming and parts of Sections 16, 20, 21, 22, 27, 28, 29, 32, 33, 34, and 35, Township 39 North, Range 78 West, 6th P.M., Natrona County, Wyoming
Purpose of the Appraisal:	To provide the appraiser's best estimate of the market value of the surface rights of the subject real property as of the effective date of the appraisal
Site Size:	9,321 acres
Improvements:	None
Zoning:	"R-F", Ranching and Farming
Highest and Best Use:	Agricultural (Plottage to Economic Ranch)
Value Estimate by the Direct Sales Comparison Approach:	$699,000
Value Estimate by the Cost Approach:	Omitted
Value Estimate by the Income Approach:	Omitted
Final Estimate of Market Value:	$699,000
Date of the Appraisal:	July 27, 1996
Appraised By:	James E. Wren, SRPA, SRA - Certified General Real Estate Appraiser

IDENTIFICATION AND LOCATION OF THE SUBJECT PROPERTY

The subject of this appraisal report is the surface rights of approximately 9,321 acres of land that is known as the United States Naval Petroleum Reserve #3. The subject property is located approximately 20+ miles north of the City of Casper, Natrona County, Wyoming and approximately five miles south of the Town of Edgerton, Natrona County, Wyoming and its west boundary lies approximately 1/4 mile east of Highway No. 259.

APPRAISAL ASSIGNMENT

As instructed by the client, this is a summary appraisal report which is intended to comply with the reporting requirements set forth under Standards Rule 2-2(b) of the Uniform Standards of Professional Appraisal Practice for a Summary Appraisal Report. As such, it presents only summary discussions of the data, reasoning, and analyses that were used in the appraisal process to develop the appraiser's opinion of value. Supporting documentation concerning the data, reasoning, and analyses is retained in the appraiser's file. The depth of discussion contained in this report is specific to the needs of the client and for the intended use stated below. The appraiser is not responsible for unauthorized use of this report.

Furthermore, in accordance with prior agreement between the client and the appraiser, this report is the result of a limited appraisal process in that certain allowable departures from specific guidelines of the Uniform Standards of Professional Appraisal Practice were invoked. The value of any minerals, oil, gas, or surface structural improvements are not considered and the Cost and Income Approaches are omitted. The intended user of this report is warned that the reliability of the value conclusion provided may be impacted to the degree there is departure from specific guidelines of U.S.P.A.P.

CLIENT

Gustavson Associates, Geologists and Engineers, 5757 Central Avenue, Suite "D", Boulder, Colorado 80301, Attention Mr. John Gustavson, President.

APPRAISER

James E. Wren, SRPA, SRA, James E. Wren Company, Inc., 341 East "E" Street, Suite 260, Casper, Wyoming 82601.

PURPOSE OF THE APPRAISAL

The purpose of this appraisal is to provide the appraiser's best estimate of the market value of the surface rights of the subject real property as of the effective date of the appraisal.

DEFINITION OF MARKET VALUE

Market value is defined by the Federal Financial Institution's regulatory agencies as follows:

> Market value means the most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:
>
> 1. Buyer and seller are typically motivated;
>
> 2. Both parties are well informed or well advised, and acting in what they consider their own best interests;
>
> 3. A reasonable time is allowed for exposure in the open market;
>
> 4. Payment is made in terms of cash in U. S. dollars or in terms of financial arrangements comparable thereto; and
>
> 5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.[1]

FUNCTION OF THE REPORT AND INTENDED USE

The function of this appraisal report is to assist the client, Mr. John Gustavson, President, Gustavson and Associates, as their interests may be served, including assisting their efforts in estimating the total value of the subject property, including the mineral rights, production, and surface improvements utilized in the production and development of the oil reserves.

---

[1] Source: Office of the Comptroller of the Currency under 12 CGF, Page 34, Subpart C-Appraisals, 34.42 Definitions.

INTEREST VALUED

The subject property is appraised as a fee simple estate -- an absolute fee, a fee without limitations to any particular class of heirs or restrictions, but subject to the limitations of eminent domain, escheat, police power, and taxation. Liens and encumbrances, if any, whether or not of public record, are ignored and the property is appraisal as though free and clear and no liens or encumbrances exist. Mineral rights, oil reserves, and all improvements on site and in use for the production of oil, natural gas, or other minerals, are specifically excluded from consideration in this appraisal report.

QUALIFICATIONS OF THE APPRAISER

The appraiser, James E. Wren, SRPA, SRA, acknowledges that he is experienced in appraising properties similar to the subject, and that he is currently certified by the Wyoming State Appraiser Board as a Certified General Appraiser. The appraiser's qualifications are detailed at the end of this report.

EFFECTIVE DATE OF THE APPRAISAL

The effective date of the appraisal is July 27, 1996. All value conclusions provided in this report reflect market conditions as of this date.

DATE OF THE REPORT

August 9, 1996

LEGAL DESCRIPTION

Description of Lands Within Naval Petroleum Reserve #3

On April 30, 1915, President Wilson created from lands forming a part of Petroleum Reserve No. 8 withdrawn July 2, 1910, Naval Petroleum Reserve No. 3 to "be held for the exclusive use or benefit of the United States Navy until the order is revoked by the President of Congress". The lands included therein and totaling 9,481 acres were described as follows:

Township 38 North, Range 78 West, 6th P.M., Natrona County, Wyoming

Section 2:	Lots 3 and 4, S/2NW/4, SW/4, SW/4NE/4, W/2SE/4
Section 3:	All
Section 4:	Lots 1, 2, S/2NE/4, NE/4NW/4, N/2SE/4, SE/4SE/4
Section 9:	E/2NE/4, NE/4SE/4
Section 10:	All
Section 11:	W/2NE/4, W/2SE/4
Section 14:	All
Section 15:	N/2, N/2SW/4, SE/4SW/4, SE/4
Section 22:	NE/4, NE/4NW/4, E/2SE/4
Section 23:	All
Section 26:	NW/4NE/4, N/2NW/4

Township 39 North, Range 78 West, 6th P.M., Natrona County, Wyoming

Section 16:	NE/4SW/4, S/2SW/4, SW/4SE/4
Section 20:	E/2NE/4, SE/4
Section 21:	All
Section 22:	SW/4SW/4, SW/4
Section 27:	W/2NE/4, W/2, SE/4
Section 28:	All
Section 29:	E/2, E/2NW/4, N/2SW/4, SE/4SW/4
Section 32:	N/2NE/4, SE/4NE/4
Section 33:	N/2, N/2SW/4, SE/4SW/4, SE/4
Section 34:	All
Section 35:	SW/4NW/4, W/2SW/4, SE/4SW/4

While included in Naval Petroleum Reserve No. 3 by the order of April 30, 1915, the 160 acres in Section 16, Township 39 North, Range 78 West, belonged to the State of Wyoming; title vested in the State to the whole of Section 16 on July 10, 1890, the date of entry of Wyoming into the Union, by virtue of the provisions of Section 14 of the Act of Congress approved July 25, 1868, (15 Stat. 178) (covering school sections) inasmuch as this section was known to be of mineral character on July 10, 1890 (confirmed by report of February 13, 1929 of H. W. MacFarren, Mining Engineer of the General Land Office). Excluding these 160 acres the area of Naval Petroleum Reserve No. 3 is therefore 9,321 acres. (See Compilation of Data on Naval Petroleum Reserve No. 3 (Teapot Dome), May 31, 1930, by Inspector, Naval Petroleum and Oil Shale Reserves, as Pages 13-14.)

OWNER OF RECORD

Based on information provided the appraiser by the client and the U. S. Department of Energy, the owner of record of the subject property is:

THE UNITED STATES NAVY

ZONING

According to the Natrona County Planning Department, the subject lands are zoned "R-F", Ranching and Farming; however, mineral extraction activities are exempt from the zoning regulation (Natrona County, 1978).

ASSESSED VALUE AND TAXES

The subject is owned by the United States Government; therefore, at present, it is exempt from ad valorem taxes.

SALES HISTORY OF THE SUBJECT PROPERTY

The subject property has not sold in the past 81 years. Ownership of the subject land (Naval Petroleum Reserve #3), was created by the following Act:

> On April 30, 1915, President Wilson created from lands forming a part of Petroleum Reserve No. 8 withdrawn July 2, 1910, Naval Petroleum Reserve No. 3 to "be held for the exclusive use or benefit of the United States Navy until the order is revoked by the President or Congress".

AREA ANALYSIS - NATRONA COUNTY

Natrona County is located near the center of the State of Wyoming and the City of Casper is the county seat. The principle land use of the unincorporated areas of Natrona County (5,300 square miles) is large unit cattle and sheep ranching; however, in recent years, tracts too small to provide economic ranching operations are being purchased for hobby ranches that provide desirable aesthetic settings for a rural residence.

Population and Employment

The socioeconomic study area is defined for the purpose of this report as Natrona County (including the City of Casper and other incorporated municipalities). The estimated 1990 population of Natrona County was 61,226 (CAEDA, 1993). The estimated 1990 population of the City of Casper was 46,742, which accounted for 76.3 percent of the total population of Natrona County (CAEDA, 1993). Population in Natrona County dropped by 14.8 percent between 1980 and 1990, from 71,856 to 61,226 (CAEDA, 1993). This population loss reflected a statewide trend brought about by declining oil prices and subsequent decreasing employment in the early 1980's.

Population growth in the county is expected to occur at a slow but steady rate over the next five years, with the population projected to reach 64,926 in 1998. This is a projected 6 percent increase over the 1990 total population, but is still less than the peak 1980 population of 71,856 (State of Wyoming, 1992a). This growth rate is approximately the same as that projected for the entire state, which is also expected to grow by about 6 percent over the same period (State of Wyoming, 1992a). The majority of Natrona County's population growth is expected to occur in and around the City of Casper.

Total employment in Natrona County was 36,637 in 1990, an increase of 3.6 percent over 1989. Unemployment in Natrona County in 1990 was 5.8 percent, down from 6.9 percent in 1989, and slightly higher than the statewide average of 5.4 percent (CAEDA, 1993). The largest employment sectors in the county (for non-proprietary employees) are in services (32%), retail trade (23%), and government and government enterprises (17%), which together in 1990 employed 72 percent of all workers in the study area (State of Wyoming, 1992a). On a statewide level, these sectors accounted for about 62.3 percent of all jobs in 1990 (State of Wyoming, 1992b).

Per capita income in Natrona County was $13,446 in 1990, slightly higher than the statewide average of $12,008 (Rand McNally, 1992).

Housing

Natrona County has approximately 29,082 housing units, of which approximately 69 percent are owner-occupied and approximately 31 percent renter-occupied. Within the City of Casper, the ratio is 66 percent owner-occupied and 34 percent renter-occupied (Morris, 1993). Eighteen percent of all housing units in Natrona County were vacant in 1990, compared to 14.7 percent in Casper that same year (Morris, 1993). The median home value in Natrona County in 1990 was $53,100, approximately 16 percent lower than the median value of $61,600 for the state of Wyoming. For the renter-occupied housing units, the median rent in 1990 was $252, compared to the statewide average of $270 (Wyoming State Data Center, 1992). New construction in Natrona County (as indicated by the number of building permits issued) decreased by 43 percent between 1980 and 1990, from 1,343 to 764 (CAEDA, 1992).

Transportation

Interstate Highway 25 provides the major north-south access through much of Natrona County, and is located approximately 8 miles (13 km) west of the subject site. Interstate 25 is a four-lane interstate highway with a median and narrow shoulders. Wyoming Route 259 is a two-lane secondary road with no median and narrow shoulders, which runs in a general north-south direction, connecting Interstate 25 with Wyoming Route 387. The subject site is accessed by a gravel road which is entered from Route 259, approximately 5 miles (8 km) south of the Town of Midwest.

In 1991, the estimated Vehicles Per Day/Average Daily Totals (VPD/ADT) for Interstate 25 at the north Casper city limit was 3,710 (both directions). The VPD/ADT for Interstate 25 at Ormsby Road was also 3,710, and the VPD/ADT for Interstate 25 at Wyoming Route 259 was 3,270 in 1991. Wyoming Route 259 had an estimated VPD/ADT of 1,490 in 1991 (leek, 1993). VPD/ADT totals show the current level of service on these road segments to be well below their carrying capacity. Traffic conditions on these roads, therefore, could be characterized as free-flowing with no congestion (Leek, 1993).

A road construction project on approximately 10 miles (16 km) of Interstate 25 north of the Casper city limit was recently completed. No other major construction projects are anticipated for roads in the vicinity of the subject (Leek, 1993).

Air transportation services in Natrona County are provided at the Natrona County International Airport in Casper. The airport offers both freight and passenger services. Private airstrips are likely to exist in the county, although information concerning their exact number and location is not available (Keller, 1993b).

Rail transportation services are provided by the Burlington Northern Railroad and the Chicago and Northwestern Railroad. Both railroads run in a northwest-southeast direction and are located approximately 35 miles (56 km) from the subject. Both railroads provide freight service only (no passenger service) to the Casper area.

Community Service

Public education in Natrona County is provided by the Natrona County School District No. 1 which has jurisdiction over the entire county. Total enrollment during the school year (1992-1993) was 12,975, and the total number of certified teachers was 904 (Cadwell, 1993; Catellier, 1993). The district operates a total of 40 schools, including 26 elementary schools, 3 high schools, 4 junior high schools, 1 correctional school, and 6 rural schools. Attendance in these schools is generally below capacity (Cadwell, 1993).

Health services in Natrona County are provided by the Wyoming Medical Center in Casper, which has a maximum capacity of 232 beds.

Police protection in Natrona County is provided by the Natrona County Sheriff's Office, which has one police station and approximately 70 sworn officers (Calder, 1993). The City of Casper also maintains a police force, consisting of one station and approximately 68 sworn officers (Honeycutt, 1993).

Fire protection services in the county are provided by the Natrona County Fire Department, which has one fire station and 13 full-time firefighters. Additional fire protection is provided by 6 volunteer fire departments, which are located throughout the county. Fire protection services for the subject are provided by the Midwest and Edgerton volunteer fire departments, approximately 15-20 minutes away (Sullivan, 1993). The City of Casper Fire Department consists of 5 stations and 67 firefighters (Loomis, 1993).

The chief provider of electric service in Natrona County is the Pacific Power and Light Company. Gas service is provided by Northern Gas of Wyoming (CAEDA, 1992).

NEIGHBORHOOD DATA

The general neighborhood can be considered the majority of the northeast quarter of the State of Wyoming.

Boundaries - The boundaries of the general neighborhood are both natural and man-made. The west boundary is the Big Horn Mountain Range, the east boundary is the Wyoming State Line, the south boundary is the North Platte River, and the north boundary is Interstate Highway 90 and U. S. Highway 16. Cities within the general neighborhood include the Cities of Casper and Gillette, the Towns of Midwest, Edgerton, Buffalo, Moorcroft, Upton, Newcastle, Lusk, Douglas, and Glenrock.

The Immediate Neighborhood - The immediate neighborhood is the northeast quarter of Natrona County which includes the Towns of Midwest and Edgerton and the City of Casper.

Access - Primary access through the general area east to west is provided by Interstate Highways 25 and 90 as well as State Highways 387, 450, and U. S. Highways 16 and 18. North-south access is provided by Interstate Highway 25, U. S. Highway 18/85, and State Highways 59, 50, and 259. Access through the interior of the neighborhood is provided by county maintained dirt or gravel roads.

Composition - The unincorporated area of the neighborhood is used primarily for large unit cattle and sheep ranching; however, oil fields are scattered throughout the area and coal mines are predominant in the eastern part of the neighborhood between the Towns of Douglas and Gillette.

Topography and Drainage - The neighborhood is generally known as the Powder River Basin, a prairie setting bounded on the west by the Big Horn Mountain Range and the Black Hills to the east. The topography is generally rolling hills fragmented by numerous small gullies. Primary drainage is provided by numerous creeks that flow into the Powder River, Cheyenne River, and the North Platte River.

Vegetation - Native grasses and scattered sagebrush with small pines along the ridges.

Utilities - In the unincorporated areas, utilities are provided by the following:

Water - Private wells

Sewer - Private septic systems

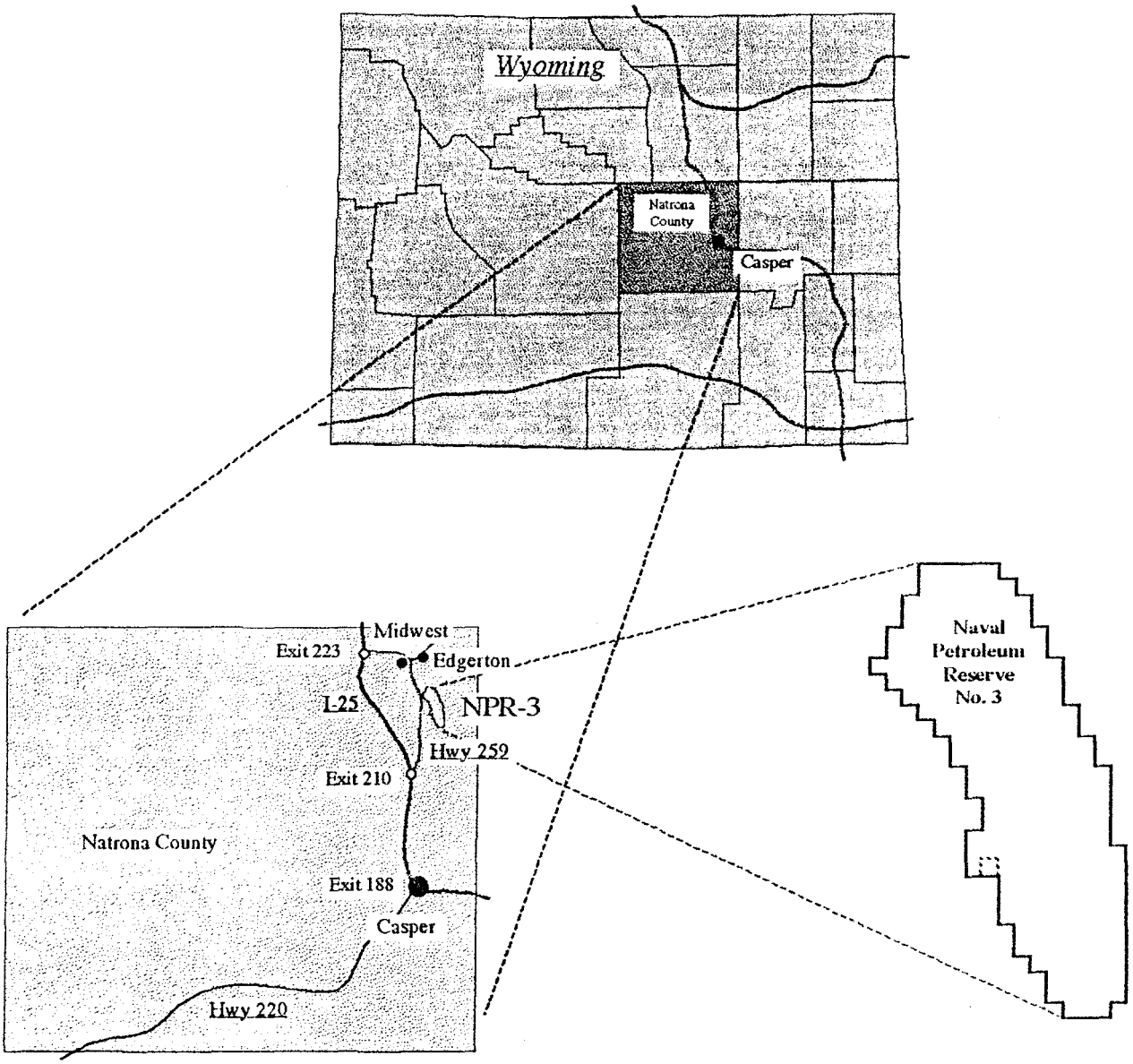
Electricity - Pacific Power and Light Company

Natural Gas - Northern Gas, Division of K N Energy in some areas, the balance is bottled gas

Telephone - U. S. West Communications

Police and Fire Protection - Police and fire protection are provided in the immediate area of the subject by the Natrona County Sheriff's Office and the Natrona County Fire Department.

Neighborhood Map



NPR-3 Vicinity Map

APPRAISAL DEVELOPMENT AND REPORTING PROCESS

In preparing this appraisal, the appraiser has:

- Made a thorough inspection of the subject lands
- Took sufficient photographs to adequately depict the subject property
- Reviewed the Sitewide Environmental Assessment #EA-1008 provided by the Department of Energy
- Gathered information on sales of comparable properties
- Confirmed and analyzed the data and applied the Direct Sales Comparison Approach to arrive at the estimate of the subject's market value as of the effective date of the appraisal report.

Per prior agreement with the client, the appraiser did not use either the Cost of Income Approaches to Value or consider the value of mineral rights, petroleum reserves, or any surface structural improvements or surface of subsurface equipment on site or in use for the production or development of oil, natural gas, or other minerals. Although these approaches would generally be considered meaningful in appraising a property of this type, the appraiser believes the primary approach to surface value sought is the Sales Comparison Approach. The appraisal process, therefore, involved departure from Standards Rule 1-4(b) i, ii, iv, v, and vi.

This Summary Appraisal Report is a brief recapitulation of the appraiser's data, analyses, and conclusions. Supporting documentation is retained in the appraiser's file.

DESCRIPTION OF THE SUBJECT LAND

Land Use

The land that is the subject of this appraisal report consists of 9,321 acres of land that is the land area of the U. S. Naval Petroleum Reserve #3. The subject presently and historically has been utilized for oil production; however, the purpose of this report is to arrive at an estimate of the market value of the surface rights only. Therefore, for the purpose of this report, the primary discussion of the land characteristics will be directed toward the surface rights.

The land surface is characterized by prairie with occasional sagebrush, several cut ravines, and sandstone bluffs. Although formerly utilized for livestock grazing, the Department of Energy has informed the appraiser that this practice has been discontinued at present.

Construction of roads and other facilities and supporting infrastructures required for the operation of the oil field resulted in the disturbance of 1,723 acres or approximately 18.5% of the total acreage; however, approximately 1,019 acres have been reclaimed (revegetated). Thus, at present, approximately 8,617 acres can be considered as usable grazing land.

Aesthetics

The subject property is typical of much of central Wyoming. It consists of rolling terrain covered with native grass and sagebrush and is fragmented by numerous small gullies. The subject is surrounded by a rim of sandstone bluffs. Although portions are visible from the north along Route 259, bluffs to the south, east, and west generally isolate the subject visually from the public. The southern most end of this rim does provide a scenic view of most of the subject land. Oil field structures and activities associated with oil production operations are aesthetically consistent and a common visual feature of offsite conditions.

Water Resources

Surface Water Quantity

The subject land is drained by a series of ephemeral or intermittent stream channels that flow through steep topographic swales, locally referred to as draws. Little Teapot Creek originates in the highlnads south of the subject and enters the subject in a northerly direction across the southern boundary as an intermittent stream. Teapot Creek originates approximately 15 miles southwest of the subject and enters the subject in an easterly direction across the northwestern boundary as an intermittent stream. All other ephemeral and intermittent streams on the subject drain into Little Teapot or Teapot Creeks. Little Teapot and Teapot Creeks merge immediately south of the subject's northern boundary and exit the subject land in a northerly direction. The merged stream flows into Salt Creek less than 1 mile north of the subject, which flows to the Powder River, approximately 25 miles to the north (USGS, 1974).

Several small impoundments, none larger than 10 acres in surface area, had been constructed in the draws to serve as reservoirs during earlier operations on the subject in the 1920's. The remains of several of these impoundments still exist, but the basins only support wetlands.

Produced water obtained from the Tensleep and Madison Formations is discharged to Little Teapot Creek and its tributaries through 14 outfalls. Discharges through each outfall are regulated under NPDES permits issued by WYDEQ, Water Quality Division. Although many of the outfalls are presently inactive, and discharges through some outfalls are only sporadic, discharge through other outfalls is continuous, resulting in perennial flow in Little Teapot Creek (DOE, 1990). Discharge under any necessary general stormwater discharge permits would not be expected to make a contribution to surface flows.

Current operations at the subject do not involve the withdrawal of any surface water from the streams or ponds.

Ground Water Quantity

According to the Department of Energy, there are no high quality fresh water aquifers in the strata underlying the subject. Those strata that produce fluids either produce water with excessive levels of total dissolved solids (TDS) or a mixture of hydrocarbons and water. The Steele Shale Formation occupies the interval from the surface to an approximate depth of 2,000 feet (610m). There are two porous and permeable sandstone formations within the Steele Shale. The Sussex sandstone outcrops in a ring near the center of the Teapot Dome structure, but does not appear to contain an aquifer. The second sandstone body is the Shannon sandstone which is an oil reservoir in much of the field. A fault separates the oil reservoir from the Shannon outcrop at Salt Creek to the north. Groundwater is encountered in the Shannon in some areas north of the fault, but the concentration of Total Dissolved Solids exceeds 10,000 mg/l. No Underground Sources of Drinking Water (USDWs) of other shallow fresh water aquifers have been detected in the 795 wells drilled since 1976.

It should be noted that there is a strong distinction at the subject between "fresh water aquifers" and "USDWs". Exempted aquifers are not USDW's under the Safe Drinking Water Act, which permits aquifer exemptions for fresh water aquifers being used for Class II injection. Several such aquifer exemptions exist at the subject. In addition, aquifers that contain crude oil, natural gas, or other contaminants that make it undesirable for a water supply could also be exempted. Several other aquifers at the subject qualify for exemption under this criteria, although the actual exemption has not been pursued with the Wyoming Oil and Gas Conservation Commission. Produced water from oil and gas production is put to beneficial use for livestock and wildlife at the subject, but there would be no intention to protect it as a source of municipal

water supply. The Madison Formation, which could be a high yield, fresh water aquifer, lies below the deepest producing geologic unit within the subject at a depth of below 6,000 feet (1,800 m) but yields water of only fair quality, with a TDS level of approximately 3000 mg/L. (DOE, 1990). The Madison could be considered a USDW, but activities at the subject are not likely to impact this aquifer. Although not suitable as drinking water, water from the Madison and Tensleep Formations (at a depth of approximately 5,400 feet or 1,600 m from the surface) is utilized to supply make-up water for existing steamflooding and waterflooding EOR activities at the subject, (Fosdick, 1992b).

Surface Water Quality

The WYDEQ has determined that the streams at the subject are all Category IV streams (Doyle, 1993). Category IV streams are defined in the Wyoming Water Standards as "surface waters, other than those classified as Class I, which are determined by the Wyoming Game and Fish Department not to have the hydrologic or natural water quality potential to support fish". Thermal effluent limits are not established by the WYDEQ for NPDES Permits for discharges to Class IV streams.

Ground Water Quality

Groundwater produced with crude oil and natural gas is disposed underground by injection into the Crow Mountain Formation. The water treatment plant softener regeneration water is also injected into a disposal well. These wells are permitted through EPA's Underground Injection Control (UCI) program, which is managed by the Wyoming Oil and Gas Conservation Commission. Geologic formations that receive injected water also have an aquifer exemption authorized by the Oil and Gas Conservation Commission, which has primacy for regulating class II injection wells under the Safe Drinking Water Act.

Potable Water

Because there are no potable water wells in the vicinity of the subject, all potable water must be trucked from either the City of Casper of the Town of Midwest. Both supplies are community water systems and have been approved by the EPA as drinking water systems.

Surface and Ground Water Law - State of Wyoming

Wyoming Water Law

The Wyoming Constitution declared water to be property of the state. The State Engineer and the Board of Control have primary responsibility for water matters in Wyoming. Water rights for Wyoming are governed by the "Prior Appropriation" system of water law whereby senior appropriations are superior to subsequent (junior) water users for surface rights - "first in time, first in right." A permit is required for the use of both surface and groundwater. The holder of such a permit is perpetually entitled to the right to use this water allotment as long as the water is used "beneficially". If the owner does not use the water for the intended use within five years, the water right is subject to relinquishment.

Surface Water Rights

In most cases, Wyoming water is not purchased and sold as a commodity apart from the surface value of property when a transfer of ownership occurs. The Board of Control administers permits for the State of Wyoming and determines acceptability of a transfer of rights. The most accepted sale of water rights by the Board of Control is to a municipality. If the new owner intends to use the water for something other than the use originally permitted for, a petition to the Board of Control for the change in question is required.

DOE Surface Water Rights - Subject

The total DOE appropriated water for the subject is 203.48 acre feet (af) per year. This water is diverted from Teapot Creek and stored in on-site reservoirs and then drawn on an acre-foot basis specified by the water rights permits. Information regarding each rights location is specified in the attached Water Well Inventory table provided the appraiser by the client:

NPR-3 SURFACE WATER RIGHTS

Table 1

NPR-3 WATER RIGHTS						
Applicant	**Amount**	**Units**	**Start Date**	**Use**	**Well**	**Location**
Mammoth Oil Co.	18.28	acre-feet	5/22/23		Teapot # 19	T38N R78W Sec. 10 SWNE
Mammoth Oil Co.	5.72	acre-feet	9/14/22		Teapot # 3	T38N R78W Sec. 10 NESE
Mammoth Oil Co.	2.14	acre-feet	9/5/22		Teapot #1	T38N R78W Sec. 3 NWSE
Mammoth Oil Co.	11.64	acre-feet	3/8/23		Dry Draw	T39N R78W Sec. 34 NESE
Mammoth Oil Co.	3.22	acre-feet	12/15/22		Teapot No. 5 Draw	T38N R78W Sec. 14 SESW
Mammoth Oil Co.	1.27	acre-feet	2/8/23		Teapot No. 6 Draw	T38N R78W Sec. 15 NESE
Mammoth Oil Co.	32.85	acre-feet	8/1/22		Conley Draw	T38N R78W Sec. 4 SESE
Mammoth Oil Co.	4.73	acre-feet	2/8/23		Teapot No. 10 Draw	T39N R78W Sec. 33 SWSE
Mammoth Oil Co.	1.72	acre-feet	2/8/23		Teapot No. 8	T39N R78W Sec. 21 SWNW
Mammoth Oil Co.	2.77	acre-feet	2/8/23		Teapot No. 9	T38N R78W Sec. 2 SWNW
Mammoth Oil Co.	20.3	acre-feet	4/3/23		Teapot No. 10	T39N R78W Sec. 27 SWNW
Mammoth Oil Co.	3.8	acre-feet	9/21/22		Teapot No. 4	T38N R78W Sec. 15 SWNW
Mammoth Oil Co.	6.63	acre-feet	3/8/23		Teapot No. 15	T38N R78W Sec. 14 NESW
Mammoth Oil Co.	29.38	acre-feet	2/8/23		Teapot No. 9	T38N R78W Sec. 15 NWNW
Mammoth Oil Co.	11.87	acre-feet	3/8/23		Teapot No. 4	T38N R78W Sec. 11 SWSE
Mammoth Oil Co.	8.19	acre-feet	4/6/23		Teapot No. 18	T39N R78W Sec. 28 NESE
Mammoth Oil Co.	7.46	acre-feet	8/22/22		Murray Draw	T38N R78W Sec. 2 SWSW
Mammoth Oil Co.	4.88	acre-feet	2/8/23		Teapot No. 12	T39N R78W Sec. 27 SWSE
Mammoth Oil Co.	22.11	acre-feet	4/6/23		Teapot No. 16	T39N R78W Sec. 29 NWNE
Mammoth Oil Co.	4.52	acre-feet	2/8/23		Teapot No. 11	T39N R78W Sec. 28 SWSE
Total	203.48	acre-feet				

NPR-3 WATER WELL INVENTORY

Table 2

NPR-3 WATER RIGHTS							
Applicant	**Formation**	**Amount**	**Units**	**Start Date**	**Use**	**Well**	**Location**
DOE	Madison			9/30/93	Steam injection	57 TX 3	
Fenix and Scisson, Inc.--Operator					Oil Field waterflood	17WX-21	T39N, R78W Sec. 21 SWSW
DOE	Madison			4/16/91	Steam injection	57 TX 3	T38N, Sec. 3 SWSE
DOE	Madison	656	GPM	9/15/89		51 WX 10/51 TpX 10	T38N R78W Sec. 10 NWNE
Exxon				4/23/93		Graham Unit # 19	T37N R89W Sec. 16 NWSW
USDI BLM Casper District		5	GPM	6/30/52		Jack Water Well #1	T37N R89W Sec. 22 NENW
James D. Hendry		10	GPM	12/31/45		Jack #8	T37N R89W Sec. 22 NWSW
USDI, BLM		5	GPM	11/1/82		Jack #1	T37N R89W Sec. 22 SWNW
USDI BLM Casper District		5	GPM	11/6/61		Hendry #1	T37N R89W Sec. 25 SWNE
USDI BLM		5	GPM	9/1/82		Hendry Well	T37N R89W Sec. 25 SWNE
Matador Cattle Co.		5	GPM	8/13/73		Madden # 4-1	T37N R89W Sec. 33 SWSE
James D. Hendry		15	GPM	12/31/35		Jack #1	T37N R89W Sec. 35 SENW
DOE		50	GPM	12/28/81		Produced Water NPR # 3 B13	T38N R78W Sec. 3 SESW
John Brown E & C Inc.				12/12/90		58 WX 3	T38N R78W Sec. 3 SWSE
DOE		875	GPM	4/19/91		57 WX 3	T38N R78W Sec. 3 SWSE
DOE		0	GPM	7/2/92		#17-32 X 3	T38N R78W Sec. 3 SWSW

NPR-3 WATER WELL INVENTORY

Table 2

NPR-3 WATER RIGHTS							
Applicant	**Formation**	**Amount**	**Units**	**Start Date**	**Use**	**Well**	**Location**
DOE				7/2/92		#17-33 X 3	T38N R78W Sec. 3 SWSW
DOE				7/2/92		#78-55 X 4	T38N R78W Sec. 4 SESE
DOE				7/2/92		#88-13 X 4	T38N R78W Sec. 4 SESE
DOE				7/2/92		#87-63 X 4	T38N R78W Sec. 4 SESE
DOE		150	GPM	12/28/81		#3 B-TP-10	T38N R78W Sec. 10 NESE
DOE				9/5/89		51 TP 10	T38N R78W Sec. 10 NWNE
Lawrence Allison & Associates		120	GPM	7/22/81		34 CMX 10 (JX)	T38N R78W Sec. 10 SENE
DOE		50	GPM	12/28/81		NPR #3 B-1-10	T38N R78W Sec. 10 SENW
DOE		50	GPM	12/28/81		B-2-10	T38N R78W Sec. 10 SESE
DOE		50	GPM	12/28/91		B-1-14	T38N R78W Sec. 14 NESW
Fenix & Scisson/DOE				9/2/80		11-1-15 PWW	T38N R78W Sec. 15 NWNW
Fenix & Scisson/DOE				9/2/80		11-2-15 PWW	T38N R78W Sec. 15 SWNW
Trigood Oil Co.		12	GPM	3/14/51		Govt. "A" Water Well #1	T38N R78W Sec. 24 NESW
USDI BLM Casper District		10	GPM	10/31/66		Shamrock Water Well # 1	T38N R78W Sec. 24 NESW
Begley Ranch		17.5	GPM	2/14/73		Mike's Spring #8	T38N R78W Sec. 29 NESW
Owens Land & Livestock				5/27/94		Owens # 1	T38N R78W Sec. 31 SENW

NPR-3 WATER WELL INVENTORY

Table 2

NPR-3 WATER RIGHTS							
Applicant	**Formation**	**Amount**	**Units**	**Start Date**	**Use**	**Well**	**Location**
Staple Three Sheep Co.				3/22/94		Staple three 36	T38N R78W Sec. 36 SENW
Teapot Ranch Co.		10	GPM	10/6/76		Teapot Ranch Co. # 1	T38N R79W Sec. 22 SESE
Teapot Ranch Co.		5	GPM	11/21/78		Cow Corral	T38N R79W Sec. 22 SESW
Begley Ranch Co.		20	GPM	2/14/73		Mikes #7	T38N R79W Sec. 32 NWNW
Teapot Ranch Co.		8	GPM	9/13/77		Teapot #2	T38N R79W Sec. 34 NESE
Monsanto Co.				2/3/77		Fremont #1-16 WSW	T38N R89W Sec. 16 NESE
W.A. Moncrief		40	GPM	10/4/90		Lucy #1	T38N R89W Sec. 29 SWNW
Inc. Trinity Resources/ Spratt Ranches		5	GPM	6/5/84		Trinity Spratt # 1	T38N R89W Sec. 34 NWSE
Pacific Enterprises Oil Co.				3/12/90		Staley 'A & D' Lease	T39N R78W Sec. 6 NENW
Amoco Production Co.		1052	GPM	6/22/73		Salt Creek Battery #16	T39N R78W Sec. 6 SENW
Pacific Enterprises Oil Co.				3/12/90		Staley Government Lease	T39N R78W Sec. 6 SESW
Trigood Oil Co.		18	GPM	3/14/51		East Teapot Government Well #1	T39N R78W Sec. 11 NENW
Stanolind Oil & Gas Co.		8.5	GPM	12/31/19		Trigood Oil Co. Water Well #6	T39N R78W Sec. 16 NWNW
Begley Ranch Co.		5	GPM	2/14/73		Mike's Spring #1	T39N R78W Sec. 16 NWSW

NPR-3 WATER WELL INVENTORY

Table 2

NPR-3 WATER RIGHTS							
Applicant	**Formation**	**Amount**	**Units**	**Start Date**	**Use**	**Well**	**Location**
Stanolind Oil & Gas Co.		7.5	GPM	7/14/24		Trigood Oil Co. Well #33A NE 17	T39N R78W Sec. 17 SWNE
Pacific Enterprises Oil Co.				3/12/90		Salt Ck. S. Unit Texas 'N' Batt.	T39N R78W Sec. 19 NWNW
DOE		200	GPM	12/28/81		NPR#3 B-1-20	T39N R78W Sec. 20 NWSE
John Brown E&C Inc.		585	GPM	6/5/78		17 WX 21	T39N R78W Sec. 21 SWSW
Petrocarbon Energy Corp.		925	GPM	10/29/65		W S 201	T39N R78W Sec. 26 SESW
DOE		70	GPM	12/28/81		NPR #3 B-1-28	T39N R78W Sec. 28 NWSE
	Total	5049.5	GPM				

Geology, Soils, and Prime and Unique Farmlands

Geology

The subject land is centered over the crestal axis of an asymmetrical doubly-plunging anticline called the Teapot Dome, which is the southern extension of the much larger Salt Creek anticline. The Salt Creek anticline underlies the prolific Salt Creek Oilfield, located to the north of the subject.

The geologic column for the Teapot Dome is Figure 3-3. The oil productive horizons are the Shannon, Steele Shale, Niobrara Shale, Second Wall Creek, Third Wall Creek, Muddy, Dakota, Lakota, and Tensleep Formations. Formations currently undergoing enhanced oil recovery (EOR) operations include the Shannon and Second Wall Creek sands and the Muddy Formation.

The topography of the region surrounding the subject is characterized by rolling plains interspersed with ridges and isolated bluffs. The central part of the subject consists of a large plain, dissected by ravines (draws), that is encircled to the east, west, and south by a rim of sandstone (U.S. Navy, 1976). The area surrounding the subject is not known to be seismically active (Halliburton NUS, 1993).

Soils

The USDA Soil Conservation Service (SCS) has completed a Class III soil survey of portions of Natrona County, including the subject and surrounding lands. Soil survey mapping units covering the subject are outlined in Figure 3-4. Map pages from the soil survey covering the subject are provided in Table 3-3. Soils throughout the subject are largely derived from sodic (alkaline) parent materials and are highly alkaline and saline. The high salinity of soils on the subject is limiting to plant growth. All soils on the subject are well drained. Most soils on the subject are highly or moderately susceptible to erosion caused by heavy downpours (Davis, 1993a).

Most upland soils throughout all parts of the subject other than the peripheral ridges are mapped as Cadoma-Renohill-Samday clay loams. The Cadoma soil series is typically found on hillsides of 3 to 12 percent slope, the Renohill soil series is typically found in swales of 3 to 6 percent slope, and the Samday soil series is typically found on ridges of 3 to 12 percent slopes. These soils are derived from slopewash alluvium and residuum derived dominantly from sodic (alkaline) shale. The Cadoma and Renohill soils are moderately deep and well drained, while the Samday soils are shallow and well drained. All of these soils are highly susceptible to water erosion (Davis, 1993a).

Scattered areas of upland soils are mapped under other names and comprise soils mapped in other soil series. Most of these other upland soils are also derived from sodic (alkaline) materials. All are well drained but differ widely in their susceptibility to water erosion (Davis, 1993a). Soils in the major draws on the subject are mapped in the Haverdad-Clarkelen complex, a mosaic of soils in the Haverdad series (Haverdad loam) and the Clarkelen series (Clarkelen sandy loam). The Haverdad and Clarkelen soils are very deep and well drained, and they are only slightly susceptible to water erosion (Davis, 1993a).

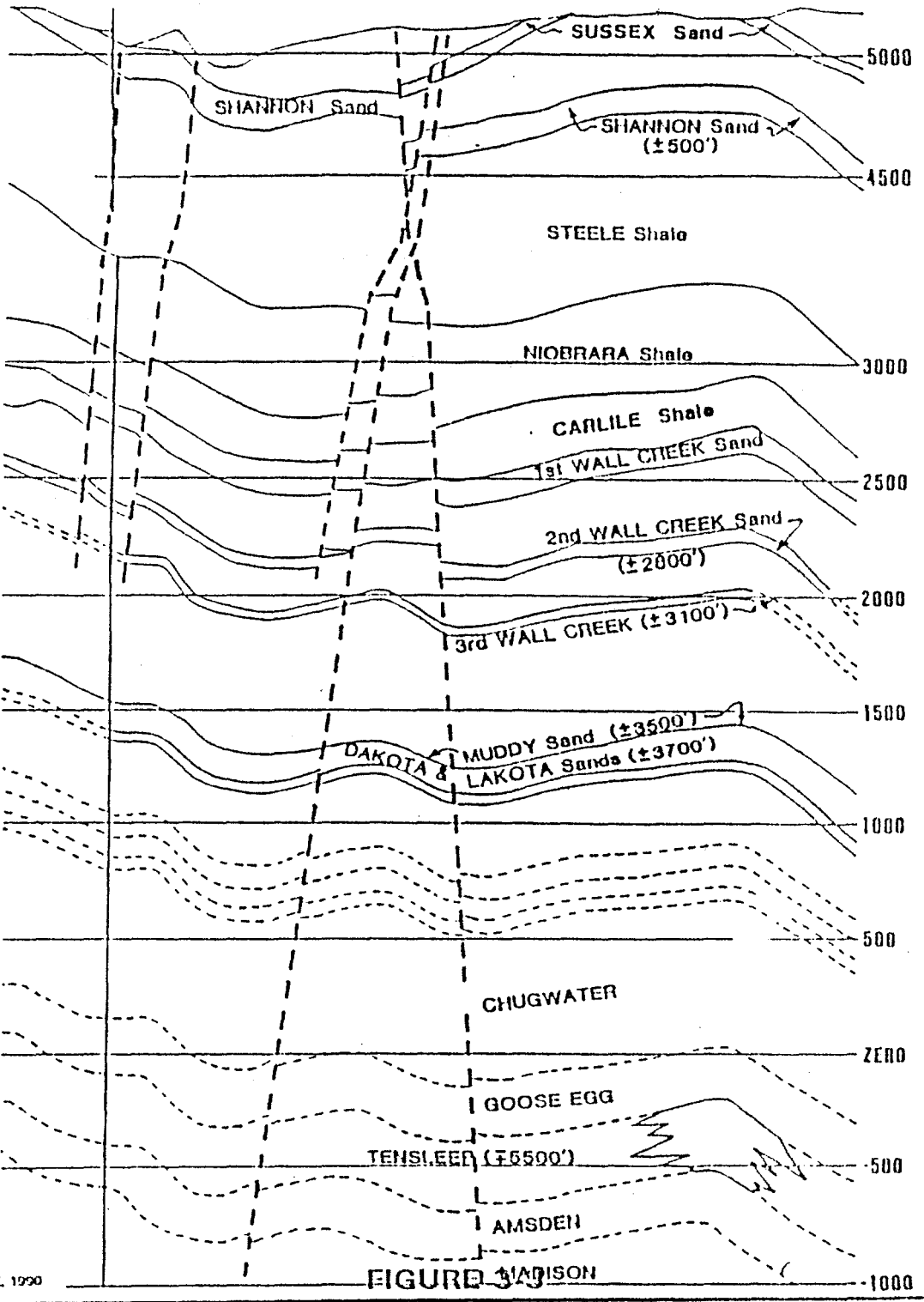
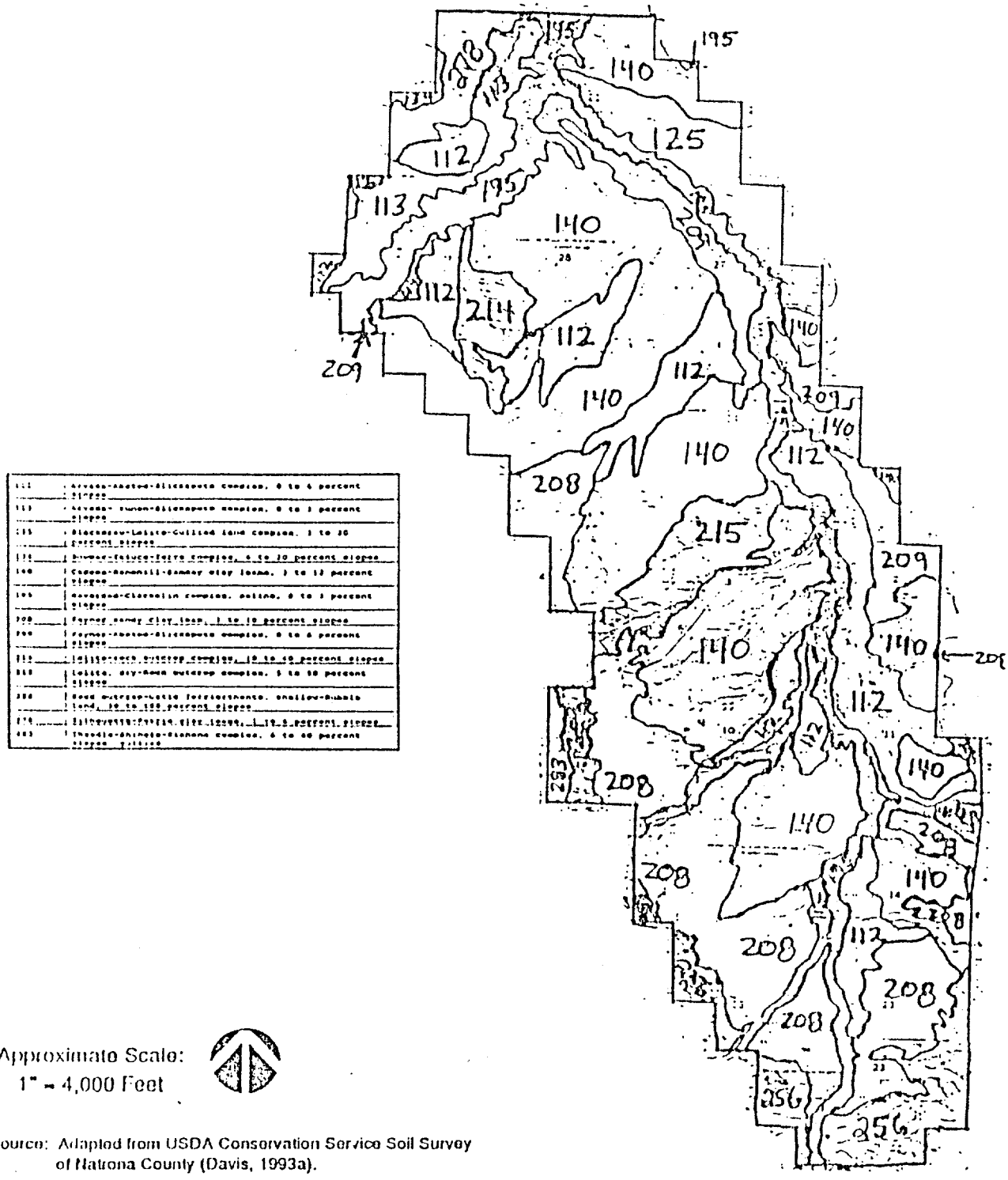


FIGURE 3-3

NAVAL PETROLEUM RESERVE #3 Natrona County, Wyoming	GEOLOGIC COLUMN AND OIL PRODUCING RESERVOIRS	SITEWIDE EA FOR CONTINUED DEVELOPMENT



Approximate Scale:
1" = 4,000 Feet

Source: Adapted from USDA Conservation Service Soil Survey of Natrona County (Davis, 1993a).

NAVAL PETROLEUM RESERVE #3 Natrona County, Wyoming	FIGURE 3-4 SOIL SURVEY	SITEWIDE EA FOR CONTINUED DEVELOPMENT

Table 3-3
Soil Survey Mapping Units

Map Unit 112:	**Arvada-Absted-Slickspots complex, 0 to 6 percent slopes**
Location on NPR-3:	Scattered upland areas throughout all parts of the reserve except for the bluffs.
Composition:	35% Arvada clay loam; 30% Absted clay loam; and 15% Slickspots.
Origin:	Alluvium derived dominantly from sodic shale (Arvada and Absted soils).
Drainage:	Well drained (Arvada and Absted soils).
Hazard of Water Erosion:	Slight (Arvada and Absted).
Capability Subclass:	VIs (Arvada and Absted soils)
Map Unit 113:	**Arvada, runon-Slickspots complex, 0 to 3 percent slopes**
Location on NPR-3:	Isolated upland area in the northern part of the reserve.
Composition:	60% Arvada loam, overflow and 25% Slickspots.
Origin:	Alluvium derived dominantly from sodic shale (Arvada soil).
Drainage:	Well drained (Arvada soil).
Hazard of Water Erosion:	Slight (Arvada soil).
Capability Subclass:	VIs (Arvada soil).
Map Unit 125:	**Blackdraw-Lolite-Gullied land complex, 3 to 20 percent slopes**
Location on NPR-3:	Scattered upland areas in the northern part of the reserve.
Composition:	45% Blackdraw clay loam; 20% Lolite clay loam; and 20% gullied land.
Origin:	Slopewash alluvium and residuum derived dominantly from noncalcareous sodic shale (Blackdraw soil); residuum derived dominantly from noncalcareous sodic shale (Lolite soil).
Drainage:	Well drained (Blackdraw and Lolite soils).
Hazard of Water Erosion:	Severe (Blackdraw and Lolite soils)
Capability Subclass:	VIe (Blackdraw soil); VIIe (Lolite soil).

Table 3-3
Soil Survey Mapping Units

Map Unit 134:	**Bowbac-Taluce-Terro complex, 6 to 20 percent slopes**
Location on NPR-3:	Scattered upland areas in the northern part of the reserve.
Composition:	40% Bowbac sandy loam; 25% Taluce sandy loam; and 15% Terro fine sandy loam.
Origin:	Slopewash alluvium and residuum derived dominantly from sandstone (Bowbac soil); residuum derived dominantly from sandstone (Taluce soil); alluvium derived dominantly from sandstone (Terro soil).
Drainage:	Well drained.
Hazard of Water Erosion:	Moderate (Bowbac and Terro soils); High (Taluce soil)
Capability Subclass:	IVe (Bowbac and Terro soils); VIIe (Taluce soil).
Map Unit 140:	**Cadoma-Renohill-Samday clay loams, 3 to 12 percent slopes**
Location on NPR-3:	Characteristic soil on the uplands throughout all parts of the reserve except for the bluffs.
Composition:	40% Cadoma clay loam; 25% Renohill clay loam; and 25% Samday clay loam.
Origin:	Slopewash alluvium and residuum derived dominantly from sodic shale (Cadoma and Renohill soils).
Drainage:	Well drained.
Hazard of Water Erosion:	Severe.
Capability Subclass:	VIe (Cadoma soil); IVe (Renohill soil); VIIe (Samday soil).
Map Unit 195:	**Haverdad-Clarkelen complex, saline, 0 to 3 percent slopes**
Location on NPR-3:	Characteristic soil within the larger draws throughout all parts of the reserve.
Composition:	50% Haverdad loam, saline and 35% Clarkelen sandy loam, saline
Origin:	Stratified alluvium from mixed sources.
Drainage:	Well drained.
Hazard of Water Erosion:	Slight.
Capability Subclass:	IVs - irrigated; VIs - nonirrigated.

Table 3-3
Soil Survey Mapping Units

Map Unit 208:	**Kayner sandy clay loam, 3 to 10 percent slopes**
Location on NPR-3:	Characteristic soil on the high ground at the foot of the bluffs near the eastern, western, and southern boundaries.
Composition:	Over 80% of this map unit is Kayner sandy clay loam.
Origin:	Alluvium derived dominantly from sodic sandstone and shale.
Drainage:	Well drained.
Hazard of Water Erosion:	Moderate.
Capability Subclass:	VIe.
Map Unit 209:	**Keyner-Absted-Slickspots complex, 0 to 6 percent slopes**
Location on NPR-3:	Small, isolated area of uplands near the western boundary.
Composition:	50% Keyner sandy loam; 20% Absted sandy clay loam; and 15% slickspots.
Origin:	Alkaline alluvium derived from mixed sources (Keyner soil); alluvium derived dominantly from sodic shale (Absted soil).
Drainage:	Well drained.
Hazard of Water Erosion:	Slight (Keyner and Absted soils).
Capability Subclass:	No information.
Map Unit 214:	**Lolite-Rock outcrop complex, 10 to 40 percent slopes**
Location on NPR-3:	Small, scattered areas of uplands in the northern part of the reserve.
Composition:	60% Lolite clay and 20% Rock outcrop.
Origin:	Residuum derived dominantly from sodic shale (Lolite soil).
Drainage:	Well Drained.
Hazard of Water Erosion:	Severe (Lolite soil).
Capability Subclass:	VIIe.

Table 3-3
Soil Survey Mapping Units

Map Unit 215:	**Lolite, dry-Rock outcrop, 5 to 50 percent slopes**
Location on NPR-3:	Isolated area of uplands near the interior of NPR-3.
Composition:	50% Lolite clay, dry and 30% Rock outcrop.
Origin:	Residuum derived dominantly from noncalcareous, sodic shale (Lolite soil).
Drainage:	Well drained (Lolite soil).
Hazard of Water Erosion:	High (Lolite soil).
Capability subclass:	VIIe (Lolite soil).
Map Unit 256:	**Rock outcrop-Ustic torriorthents, shallow-Rubble land complex, 30 to 100 percent slopes**
Location on NPR-3:	Characteristic soil on the bluffs near the eastern, western, and southern boundaries.
Composition:	40% Rock outcrop; 25% Ustic torriorthents, shallow; and 15% Rubble land
Drainage:	Well to excessively well drained (Ustic torriorthents).
Hazard of Water Erosion:	Moderate to severe. (Ustic torriorthents)
Capability Subclass:	VIII.
Map Unit 278:	**Silhouette-Petrie clay loams, 1 to 6 percent slopes**
Location on NPR-3:	Small upland area in northwestern corner.
Composition:	50% Silhouette clay loam and 30% Petrie clay loam
Origin:	Alluvium derived dominantly from shale (Silhouette soil); alluvium derived dominantly from sodic shale (Petrie soil).
Drainage:	Well drained.
Hazard of Water Erosion:	Moderate.
Capability Subclass:	VIII.

Table 3-3
Soil Survey Mapping Units

Map Unit 283:	**Theedle-Shingle-Kishona complex, 6 to 40 percent slopes, gullied**
Location on NPR-3:	Small area on extreme west-central periphery
Composition:	30% Theedle clay loam, 25% Single loam, and 20% Kishona clay loam
Origin:	Slopewash alluvium and residuum derived dominantly from sedimentary rocks
Drainage:	Well drained.
Hazard of Water Erosion:	High (Theedle and Single soils); Moderate (Kishona soil)
Capability Subclass:	VIe (Theedle and Kishona soils); VIIe (Shingle soil)

Higher elevation lands approaching the peripheral ridges are mapped as Keyner sandy clay loam. These soils are deep and well drained. The hazard of water erosion is moderate. Soils on and immediately at the base of the bluffs are mapped in the Rock outcrop-Ustic Torriorthents, shallow-Rubble land complex. These areas are characterized by exposed rock, colluvial boulders, and shallow soil (Davis, 1993a).

Prime and Unique Farmlands

The SCS does not presently recognize any prime or unique farmlands or farmlands of local importance within the boundaries of the subject. All soils on the subject are mapped in Capability Classes IV or higher, and the majority are mapped in Capability Classes VIA and higher (Davis, 1993a). The SCS defines Class IV soils as soils that have very severe limitations that reduce the choice of plants or that require very careful management, or both. The SCS defines Class VI soils as soils having severe limitations that make them unsuitable for cultivation. In general, soils in the highest numbered Capability Classes are less suitable for cultivation than soils in the lowest numbered Capability Classes.

Terrestrial Vegetation

The subject is located in part of North America where vegetation is characterized by shortgrass prairie. The last vegetation survey of the subject, performed prior to intensive development of the Reserve by the DOE in 1978, identified six major vegetation associations (Figure 3-5). These include three rangeland associations on the upland plains, two riparian associations in the bottoms of the draws, and a pine-juniper association of the peripheral ridges (U. S. Navy, 1976).

Much of the rangeland vegetation has been physically disturbed by construction of wells, drill pads, access roads, and other DOE activity since 1978. Disturbance is generally continuous throughout certain areas of intensive activity in the center of the Reserve east of the office and warehouse complexes. Disturbance elsewhere is generally localized around scattered wells and other work areas. The pine-juniper vegetation on the peripheral ridges has not generally been disturbed by the DOE operations since 1978. Except at a few road crossings, riparian vegetation in the draws has not generally been physically disturbed by DOE operations. However, riparian vegetation downstream of NPDES-permitted points of discharge has experienced increased water flows and increased water temperatures (Halliburton NUS, 1993).

The DOE reclaims and reseeds drill pads, flowline rights-of-way, and abandoned well sites on the subject, using guidelines provided by the SCS (SCS, 1992). The reseeded areas provide browse for the larger mammals, habitat for smaller animals, and reduce water and wind erosion.

The DOE does not presently lease any of the rangeland within the subject for grazing, although this would be part of the Proposed Action. The last grazing lease terminated in 1986 (Doyle, 1993). Prior to that time, rangeland within the subject was overgrazed (Young, 1986; Watson, 1987). Between 1981 and 1986, grazing on the subject exceeded 2,000 animal unit-months (AUM), whereas the Soil Conservation Service had recommended in 1965 that grazing on the subject not exceed 1,185 AUM (Watson, 1987).

Trees at the subject are largely limited to piñon pine, ponderosa pine, and juniper within small zones of pine-juniper forests on the peripheral ridges, and to a few cottonwood trees among the riparian vegetation in the draws (DOE, 1990). Except for the peripheral ridges, uplands throughout the subject lack trees. No land on the subject is managed for timber production (Doyle, 1993).

During the summer of 1987, and spring of 1988, a pilot project was initiated to introduce narrow leaf cottonwood (Populus angustifolia) and Russian olive (Eleagnus angustifolia) trees to the subject. Both species are hardy and were expected to adapt to the dry summers and cold winters. Four hundred and fifty cottonwood trees, Russian olive trees, and willow (Salix sp.) shrubs were planted along streams and ponds on the Reserve. Due to drought conditions that occurred during these years and damage done by wildlife, few of the trees survived (DOE, 1990). This project may be tried again, but using indigenous species to increase the probability of success.

Terrestrial Wildlife

The Wyoming Game and Fish Department (WGFD) maintains a database (Wildlife Observation System) of wildlife sightings throughout the state by township, range, and section. A list of species recorded in the database for those townships and ranges in the immediate vicinity of the subject is provided in Table 3-4. This list also includes several other species which have been observed over the years on the subject by the DOE staff and its contractors (U. S. Nave, 1976; Stark, 1993). This does not represent a systematic inventory of terrestrial wildlife known to occur on the subject. According to a bird and mammal distributive study for Wyoming, approximately 222 bird species and 49 mammal species have been observed in the

region containing the subject site (WGFD, 1991). The subject lies within the geographic range with at least 6 amphibians and 9 reptile species (Stebbins, 1985). Table 3-4 indicates recorded observations of 3 amphibian, 4 reptile, 61 bird, and 20 mammal species at the subject.

Pronghorn antelope and mule deer are the principal big game mammals seen at the subject (DOE, 1990). The DOE does not presently allow any hunting on the subject (Doyle, 1993). The subject does not contain any Critical Winter Range for either antelope or deer. Range within the subject is classified by the WGFD as Winter Year-Long Range for both species. The range is utilized by both species throughout the year but is not depended upon during the winter by transient deer or antelope populations that reside elsewhere during the growing season (Thiele, 1993).

Other characteristic mammal species of the subject include: raccoons, striped skunk, porcupine, badger, fox, bobcat, prairie dog (three known colonies), cotton-tail rabbit, and deer mouse. Apparently common species among the variety of birds found at the subject are the red-tail hawk, American kestrel, golden eagle, horned lark, western meadowlark, Brewer's blackbird, vesper sparrow, Brewer's sparrow, lark bunting, and sage thrasher. Characteristic amphibians and reptiles found on the subject include: toad species, sagebrush lizard, short-horned lizard, garter snake, and western rattlesnake (DOE, 1990; WGFD, 1991; WGFD, 1993).

Table 3-4
List of Species Recorded in the Vicinity of NPR-3

Common Name	Scientific Name
AMPHIBIANS	
Boreal chorus frog	*Pseudacris triseriata maculata*
Tiger salamander[b]	*Ambystomia tigrinum*
Toad sp.[c]	*Bufo sp.*
REPTILES	
Sagebrush lizard[b]	*Sceloporus graciosus*
Short-horned lizard[b]	*Phrynosoma douglassi*
Western terrestrial garter snake[bc]	*Thamnophis elegans*
Western rattlesnake[bc]	*Crotalis viridis*
FISH	
Minnow sp.[c]	*Undetermined species*
BIRDS	
American robin[a]	*Turdus migratorius*
American kestrel[ab]	*Falco sparverius*
American wigeon[ab]	*Anas americana*
American avocet[ac]	*Recurvirostra americana*
Bald eagle[ac]	*Haliaeetus leucocephalus*
Black-billed magpie[abc]	*Pica pica*
Blue-winged teal[ab]	*Anas discors*
Brewer's blackbird[a]	*Euphagus cyanocephalus*
Brewer's sparrow[ab]	*Spizella breweri*
Chukar[a]	*Alectoris chukar*
Cliff swallow[a]	*Hirundo pyrrhonota*
Common poorwill[ab]	*Phalaenoptilus nuttallii*
Common nighthawk[a]	*Chordeiles minor*
Common snipe[b]	*Capella gallinago*
Double-crested cormorant[c]	*Phalacrocorax auritus*
European starling[a]	*Sturnus vulgaris*
Gadwall[ab]	*Anas strepera*
Golden eagle[abc]	*Aquila chrysaetos*
Great horned owl[ab]	*Bubo virginianus*

Table 3-4
List of Species Recorded in the Vicinity of NPR-3

Common Name	Scientific Name
BIRDS (continued)	
Green-winged teal[ab]	*Anas crecca*
Horned lark[ab]	*Eremophila alpestris*
House wren[ab]	*Troglodytes aedon*
Killdeer[ab]	*Charadrius vociferus*
Lark bunting[a]	*Calamospiza melanocorys*
Lark sparrow[b]	*Chondestes grammacus*
Lesser yellowlegs[b]	*Tringa flavipes*
Loggerhead shrike[abc]	*Lanius ludovicianus*
Mallard[bc]	*Anas platyrhyndios*
McCown's longspur[a]	*Calcarius mccownii*
Mountain bluebird[ab]	*Sialia currucoides*
Mourning dove[ab]	*Zenaidura macroura*
Northern shrike[a]	*Lanius excubitor*
Northern (red-shafted) flicker[a]	*Colaptes (cafer) auratus*
Northern (yellow-shafted) flicker[ab]	*Colaptes auratus*
Northern harrier[ab]	*Circus cyaneus*
Northern rough-winged swallow[b]	*Stelgidopteryx serripennis*
Pectoral sandpiper[b]	*Calidris melanotos*
Pintail[b]	*Anas acuta*
Pinyon jay[b]	*Gymnorhinus cyanocephalus*
Plover sp.[c]	*Charadrius sp.*
Prairie falcon[ab]	*Falco mexicanus*
Red-tailed hawk[abc]	*Buteo jamaicensis*
Red-winged blackbird[ab]	*Agelaius phoeniceus*
Rock wren[ab]	*Salpinctes obsoletus*
Rough-legged hawk[c]	*Buteo lagopus*
Sage sparrow[ab]	*Amphispiza belli*
Sage grouse[ab]	*Centrocercus urophasianns*
Sage thrasher[ab]	*Oreoscoptes montanus*
Say's phoebe[ab]	*Sayornis saya*
Sharp-shinned hawk[a]	*Accipiter striatus*
Short-eared owl[a]	*Asio flammeus*
Spotted sandpiper[a]	*Actitis macularia*
Swainson's hawk[ab]	*Buteo swainsoni*
Turkey vulture[a]	*Cathartes aura*
Vesper sparrow[ab]	*Pooecetes gramineus*
Violet-green swallow[b]	*Tochycineta thalassina*

Table 3-4
List of Species Recorded in the Vicinity of NPR-3

Common Name	Scientific Name
BIRDS (continued)	
Western grebe[c]	*Aechmophorus occidentalis*
Western meadowlark[abc]	*Sturnella neglecta*
Western kingbird[ab]	*Tyrannus verticalis*
White-throated swift[a]	*Aeronautes saxatalis*
Wilson's phalarope[a]	*Phalaropus tricolor*
MAMMALS	
Black-tailed prairie dog[a]	*Cynomys ludovicanus*
Bobcat[ac]	*Lynx rufus*
Brush-tailed woodrat[b]	*Neotoma cinerea*
Coyote[bc]	*Canus latrans*
Deer mouse[b]	*Peromyscus maniculatus*
Desert cottontail[b]	*Sylvilagus auduboni*
Eastern cottontail[a]	*Sylvilagus floridanus*
Least chipmunk[b]	*Eutamias minimus*
Mountain lion[a]	*Felis concolor*
Mountain cottontail[a]	*Sylvilagus nuttallii*
Mule deer[ac]	*Odocoileus hemionus*
Muskrat[c]	*Ondatra zibethica*
Northern pocket gopher[b]	*Thomomys talpoides*
Porcupine[bc]	*Erethizon dorsatum*
Pronghorn[ac]	*Antilocapra americana*
Raccoon[c]	*Procyon lotor*
Red fox[ac]	*Vulpes vulpes*
Striped skunk[bc]	*Mephitis mephitis*
Swift fox[b]	*Vulpes velox*
Wyoming pocket mouse[b]	*Perognathus fasciatus*

Source: WGFD, 1993; US Navy, 1976; Stark, 1993; Soehn, 1993.

[a] Species observed within Township T 38-39N, Range R78W (on or in the vicinity of NPR-3).

[b] Species observed during survey of NPR-3, August 1975 (US Navy, 1976).

[c] Species observed by FD staff.

Floodplains and Wetlands

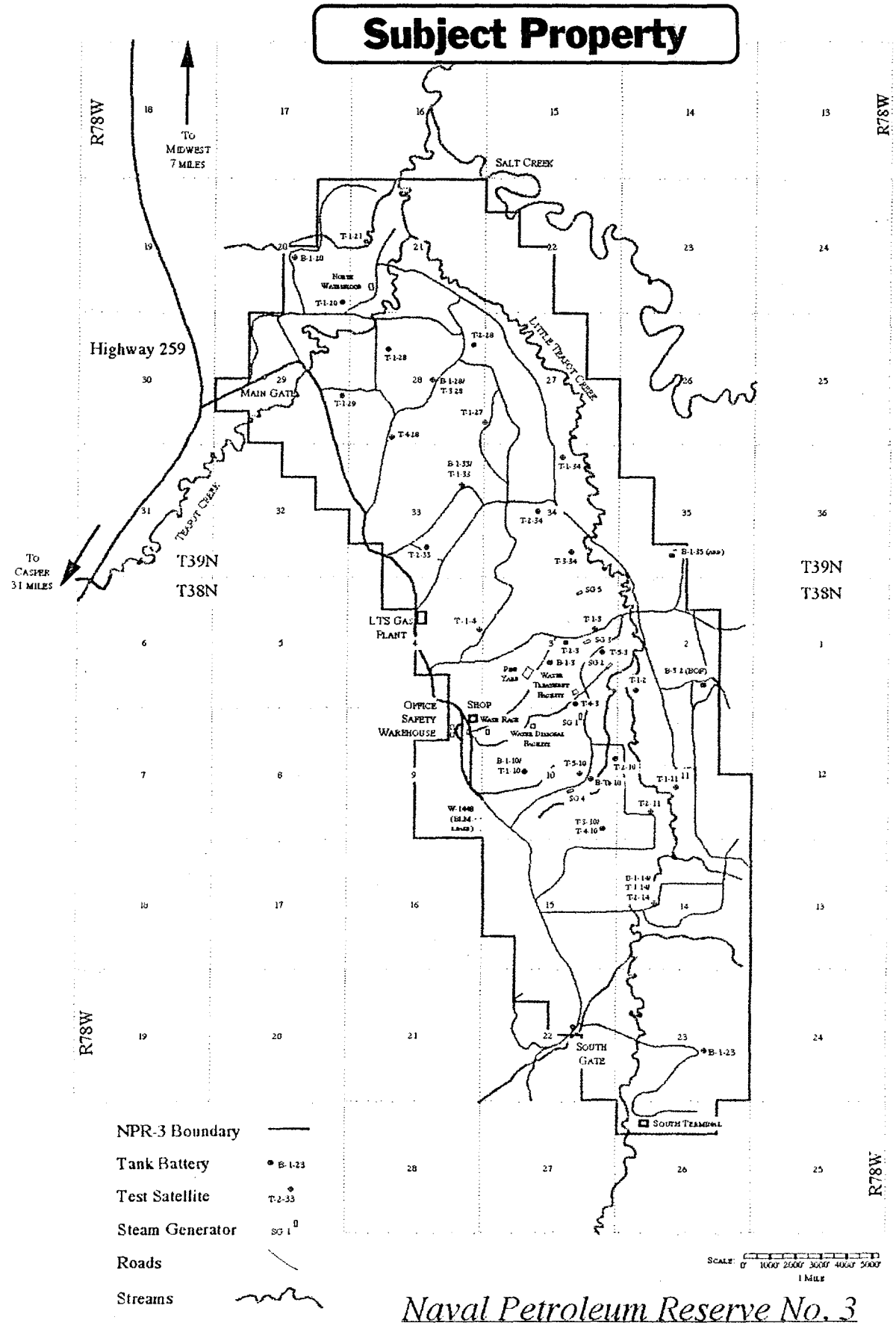
Although Flood Insurance Rate Maps (FIRM's) are available for certain parts of Natrona County, none have been prepared for the area around the subject (Keller, 1993a). The FWS prepared National Wetland Inventory (NWI) Maps for the area surrounding the subject in February 1993, which document the many impoundments and reservoirs within the subject. Some portions of the major stream beds are also classified as wetlands.

The topography of the subject, characterized by gently rolling uplands punctuated by narrow draws with steep embankments, suggests that floodplains are limited to lands within the embankments of the draws (Figure 3-6). It is likely that the areal extent of floodplains on the subject roughly corresponds to Map Unit 195 in the soil survey in Table 3-3. The low permeability of the sodic soils which predominate in much of the watershed of the draws (Davis, 1993a) suggests that brief but very intense floods could occur following infrequent downpours.

Wetlands and other areas at the subject that are regulated under Section 404 of the Clean Water Act appear to be limited to man-made ponds, stream channels, and to certain areas within the embankments of the draws. The basins of several small impoundments constructed in the larger draws on the subject during the 1920's to create reservoirs to support early oil drilling efforts (Doyle, 1993) are likely to be wetlands. No soils on the list of hydric soils compiled by the SCS for Natrona County (Davis, 1993c) or Hydric Soils of the United States (NTCHS, 1991) appear on the soil survey for areas at the subject outside of the draws.

The channels of perennial and intermittent streams within the draws are regulated under Section 404 of the Clean Water Act, even if they lack vegetation and therefore did not technically meet the definition of wetlands. Available information suggests that some portions of the draw bottoms are wetlands, although further study would be required to determine exactly how much. Draw bottom areas are mapped in Figure 3-5. Areas with the Flowing and Impounded (Wet) Riparian Vegetation Association, which is dominated by sedges (Carex sp. and Cyperus sp.), rushes (Juncus sp.), and cattails (Typha sp.), were likely to have met the definition of wetlands at the time that the figure was generated. Areas mapped with the Upland (Dry) Riparian Vegetation Association, which is characterized by thistle (Cirsium flodmanii), yarrow (Achillea lanulosa), goldenrod (Solidago sp.) and occasional grasses and grass-like species, were likely not to have met the definition of wetlands (U. S. Navy, 1976). The distribution of riparian vegetation may have changed since 1976 in draw bottoms downstream of NPDES-permitted points of discharge.

The partial extent of wetlands within the draw bottoms is also supported by soil survey data. The soil survey mapping unit which encompasses the draw bottoms (Figure 3-3) is primarily comprised of soils in the Haverdad and Clarkelen soil series, which are not listed as hydric by the National Technical Committee for Hydric Soils (NTCHS, 1991). However, the SCS notes that inclusions of other soil series which are hydric are known to occur within Map Unit 195 (Davis, 1993c).



Naval Petroleum Reserve No. 3
Roads and Facilities

HIGHEST AND BEST USE

The concept of highest and best use is fundamental to the analysis and valuation of any real property. As used here for purposes of this appraisal report, it is defined as follows:

> The reasonably probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value.[2]

An opinion of the highest and best or most probable use applies specifically to land and is premised upon, among other things, the site being vacant and ready to put to its best use. The highest and best use is the use that fully develops the land's potential.

The criteria for estimating highest and best use are that the use must be physically possible, legally permissible, financially feasible, and maximally productive; and these criteria must usually be considered sequentially. This analysis must address the type of use that will produce the greatest future benefit to the owner and that will have a strong probability of achievement.

Permissible Use

The legal uses of the land are typically controlled by public restrictions such as zoning classifications and/or private restrictions such as protective covenants or deed restrictions. Zoning, in and of itself, does not create a site's highest and best use, rather it limits the potential uses to which a site may be put. Zoning affects supply and demand since it actually limits the supply site utility of a site. The subject site is zoned "R-F", Ranching and Farming and the present use of the subject property and existing properties in the immediate area conform to this zoning; however, the present most profitable use of the subject land is as the site of an oil field which is allowable under this zoning.

Physically Possible Use

The subject consists of 9,321 acres of land that is presently improved with an existing oil field. Use of the surface of the surrounding area is for sheep and cattle ranching; however, considering the location and livestock production capability of the land, it is too small to be an economic agricultural unit but would be desirable plottage to adjacent ranches.

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[2] *The Appraisal of Real Estate*, 10th Edition: (Chicago: The Appraisal Institute, 1992), p. 275.

Financially Feasible Use

Feasible use addresses supply and demand and is a concept that there is a reasonable likelihood that a project will satisfy specific objectives. Feasibility generally pertains to income producing properties and relates to investment objectives such as stabilized occupancy, budget management, and potential value enhancement.

The use decision is fundamental to determining how much income a site can produce. Therefore, the income to the land is the driving force for property value. Conformity of use tends to dictate which uses are reasonably probable for a given site.

As previously mentioned, the subject land is presently encumbered by an existing oil field with extensive production and development activity; however, the surrounding area is predominantly utilized for cattle or sheep grazing.

Maximally Productive

Considering the total property, the most financially profitable use would be as an oil field with the surface area that is not needed for the oil production and exploration used for the grazing of livestock. Considering the surface rights only, the fact that the land is extensively encumbered with oil wells and other production and exploration equipment, the desirability of the subject for a hobby or gentlemen's ranch is greatly diminished. Therefore, the most profitable use of the subject (not considering the oil production and exploration improvements) is for the grazing of livestock only.

HIGHEST AND BEST USE AS VACANT

Based on the foregoing analysis, the highest and best use of the surface rights of the subject, as vacant, would be for the grazing of livestock.

HIGHEST AND BEST USE AS IMPROVED

The highest and best use of the subject as improved is as an oil field with the surface rights providing additional income. If the oil wells and production and development improvements are not considered, the highest and best use of the surface rights only of the subject is for plottage to an adjoining ranch.

THE APPRAISAL PROCESS

Appraisal techniques are the specifics of the three approaches that are traditionally used to derive separate indications of real property value. One or more approaches may be used, depending on their applicability to a particular appraisal assignment.

In assignments to estimate market value, the ultimate goal of the valuation process is a well supported conclusion that reflects the appraiser's consideration of all influences on the market value of the property being appraised. Therefore, the appraiser studies the property from each of the applicable viewpoints reflected in the three approaches.

APPROACHES TO VALUE

In the appraisal of real estate, there are three basic traditional approaches for estimating property value. The three approaches are: The Direct Sales Comparison Approach (also referred to as the Market Approach), the Cost Approach, and the Income Approach. The final step in estimating a property's "market value" (i.e., most probable selling price) is to correlate the value estimates of the three approaches into a single value estimate.

The Direct Sales Comparison Approach

This approach is based on the proposition that an informed purchaser would pay no more for a property than the cost to him of acquiring an existing property with the same utility. This approach is applicable when an active market provides sufficient quantities of reliable data which can be verified from authoritative sources. The Direct Sales Comparison Approach is relatively unreliable in an inactive market or in estimating the value of properties when no real comparable sales data is available.

The Cost Approach

This approach is based on the proposition that the informed purchaser would pay no more than the cost of producing a substitute property with the same utility as the subject property. It is particularly applicable when the property being appraised involves relatively new improvements which represent the highest and best use of land or when unique or specialized improvements are located on the site for which there exists no comparable properties on the market.

The Income Approach

This approach is based on the proposition that a property is worth no more than the capitalized value of the income stream that the property is capable of generating. The procedure converts anticipated benefits (dollar income) to be derived from the ownership of the property into a value estimate. The Income Approach is widely applied in appraising income producing properties. Anticipated future income and/or reversions are discounted to a present worth figure through the capitalization process.

VALUATION PROCESS

The valuation process is a systematic procedure employed to provide the answer to a specific question relative to real property value. The first step in the valuation process is to define the appraisal problem. This includes identification of the real estate and property rights to be valued plus specification of the date and function of the appraisal as well as the definition of value sought and limiting conditions affecting the value analysis. The application of appraisal techniques generally involves three specific appraisal approaches that are traditionally used to derive separate indications of real property value. One or more approaches may be used, depending on the applicability to a particular appraisal assignment. These three approaches are generally referred to as the Cost Approach, the Income Capitalization Approach, and the Direct Sales Comparison Approach. These three approaches are most often interrelated and each involves considerable data gathering and analysis. This includes cost data, income and expense data, and sale data in relation to the property being appraised; however, as previously stated, per prior agreement with the client, the appraiser did not report either the Cost or Income Approaches to Value.

THE DIRECT SALES COMPARISON APPROACH

The Direct Sales Comparison Approach involves using data from comparable properties which have sold or are listed for sale which are similar to the subject property to estimate its value. A major premise of this approach is that the market value of the property is directly related to the prices of competitive comparable properties. This method works best when adequate market data is available of similar properties.

Whenever possible, all these estimation procedures are used, but in some instances, some of the approaches are not applicable. In this analysis, as previously outlined, the Income Approach and the Cost Approach Methods are considered but not included in this report.

The appraiser searched the central and northeastern Wyoming real estate market for sales of properties comparable to the subject. Twenty sales of ranch properties located in northeastern Wyoming that sold between 1994 and the present were analyzed and the six sales most like the subject are included in this report. These properties, though dissimilar in some respects, are considered to provide reliable indications of the various components of the subject property. Following is the pertinent data on the comparable sales followed by an analysis:

COMPARABLE SALE NO. 1

Location:	2-1/2 miles west of Linch, Wyoming
Grantor:	Mike Walker (Clinton Patrick, Trustee)
Grantee:	Lee D. and Debra A. Lohse, Glen R. and Dana M. Lohse
Instrument:	Warranty Deed, Book 87A-36, Page 615
Recorded:	March 25, 1995
Legal Description:	Township 42 North, Range 78 West, 6th P.M., Johnson County, Wyoming - Section 13, E/2E/2; Section 22, SE/4; Section 23, S/2S/2; Section 24, E/2NE/4, SW/4NE/4, S/2; Section 25, NE/4, NE/4NW/4, N/2S/2; Section 26, NW/4NW/4, S/2N/2, N/2S/2; Section 27, N/2NE/4, SW/4NE/4, SE/4NW/4; Section 33, W/2SE/4; Section 34, SE/4, N/2SW/4, SE/4SW/4; Section 35, SW/4SW/4
Price:	$600,000
Terms:	See comments
Total Acres:	6,775 acres deeded, 2,355 acres B.L.M.
Carrying Capacity:	140 animal units
Access:	Gravel private road
Verified By:	Pearson Real Estate
Inspected By:	James E. Wren
Price/Deeded Acre:	$88.56
Price/Animal Unit:	$4,286
Topography:	Rolling hills with some steep grades

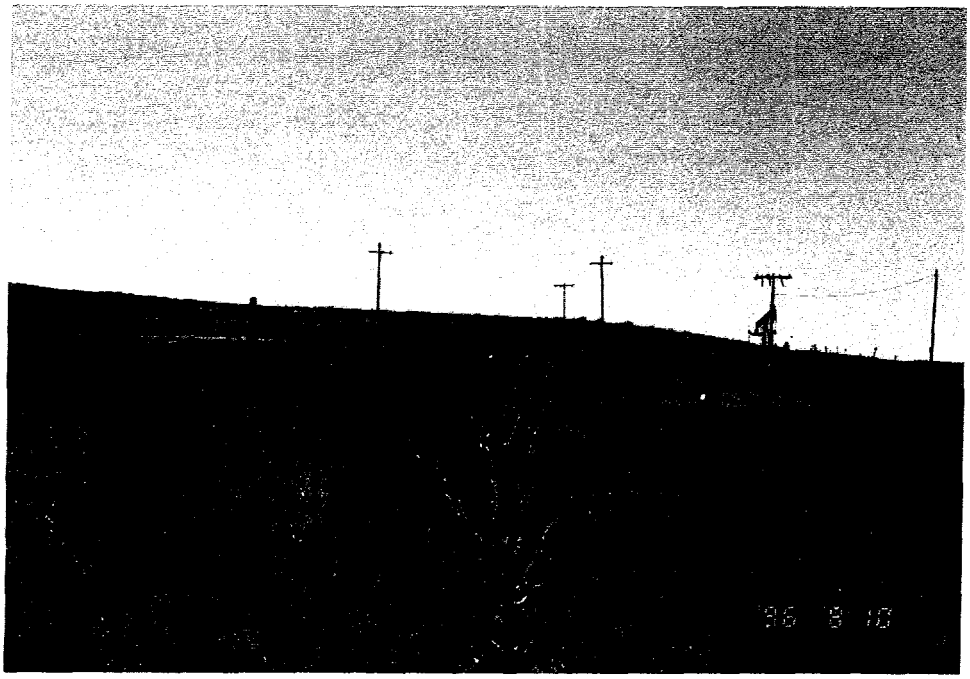
COMPARABLE SALE NO. 1 (continued)

Vegetation Cover:	Plains zone (4,000 to 6,000 feet above sea level) short prairie range grasses, wheatgrass, sagebrush
Water:	Reservoirs, wells, Meadow Creek, stock water pipeline share with neighbors (Meike)
Effective Gross Income:	$14,700
Estimated Expenses:	$2,421
Net Operating Income:	$12,279
Overall Rate:	2%
Comments:	Good summer pasture which may carry 200 yearlings. Not for wintering livestock. Located in good ranch land area of southern Johnson County. Terrain is difficult to drive through. Many oil wells in area which are a source of water. B.L.M. Permit No. 4-7627, fee of $1.61 per A.U.M. Owners are out of state. No lease fee is continued. Taxes $1,095. Purchase involved a 1031 exchange with buyers. $275,000 down at closing and $325,000 at 7-1/2% amortized 30 years with balloon on 11th year

ALLOCATION OF SALE

ELEMENT	ACRES/A.U.M.s	$/ACRE	$/A.U.M.	TOTAL
Rangeland	6,775 Acres	$85.52		$579,385
B.L.M. Lease	2,355/589		$35	$ 20,615
Improvements				-0-
TOTAL				**$600,000**

COMPARABLE SALE NO. 1



COMPARABLE SALE NO. 2

Location:	Headquarters is southeast of Edgerton, Wyoming
Grantor:	Meadow Creek, L.L.C.
Grantee:	Salt Creek Ranch, L.L.C.
Instrument:	Special Warranty Deed #523979
Sale Date:	May 6, 1993, recorded May 7, 1993
Legal Description:	A complete legal is available in the appraiser's file, a brief description is of lands situated in the following: Townships 38 and 39 North, Ranges 75, 76, and 77 West, 6th P.M., Converse County, Wyoming, Townships 39, 40, and 41 North, Ranges 77 and 78 West, 6th P.M., Natrona County, Wyoming, and Township 41 North, Ranges 77 and 78 West, 6th P.M., Johnson County, Wyoming
Price:	$1,300,000
Terms:	Cash to seller
Total Acres:	20,260 acres deeded, 2,680 acres State of Wyoming Lease, 12,160 acres B.L.M. Lease for a total of 35,100 acres
Price/Deeded Acre:	$64.17
Verified By:	Pearson Real Estate
Inspected By:	James E. Wren
Access:	Gravel road
Topography:	Rolling prairie, some steep bluffs and draws
Vegetation:	Short native grasses, scattered sagebrush, and short pines on ridges
Water:	Wells and reservoirs

COMPARABLE SALE NO. 2 (continued)

Motivation of Sale:	Arms-Length
Effective Gross Income:	Not available
Estimated Expenses:	Not available
Net Operating Income:	Not available
Overall Rate:	Not available
Comments:	Well balances ranch. The buyer also bought the Boliver Springs Ranch from the same seller at the same time. The Boliver Springs Ranch contained 19,600 acres of deeded land, 1,720 acres of Wyoming State Lease land, and 3,360 acres of B.L.M. Lease land.

ALLOCATION OF SALE

ELEMENT	ACRES/A.U.M.s	$/ACRE	$/A.U.M.	TOTAL
Rangeland	20,260 Acres	$54.79		$1,110,100
B.L.M. Permit	12,160/3,040		$35	$ 106,400
Wyoming State Lease	2,680/670		$50	$ 33,500
Improvements				$ 50,000
TOTAL				**$1,300,000**

COMPARABLE SALE NO. 2

COMPARABLE SALE NO. 3

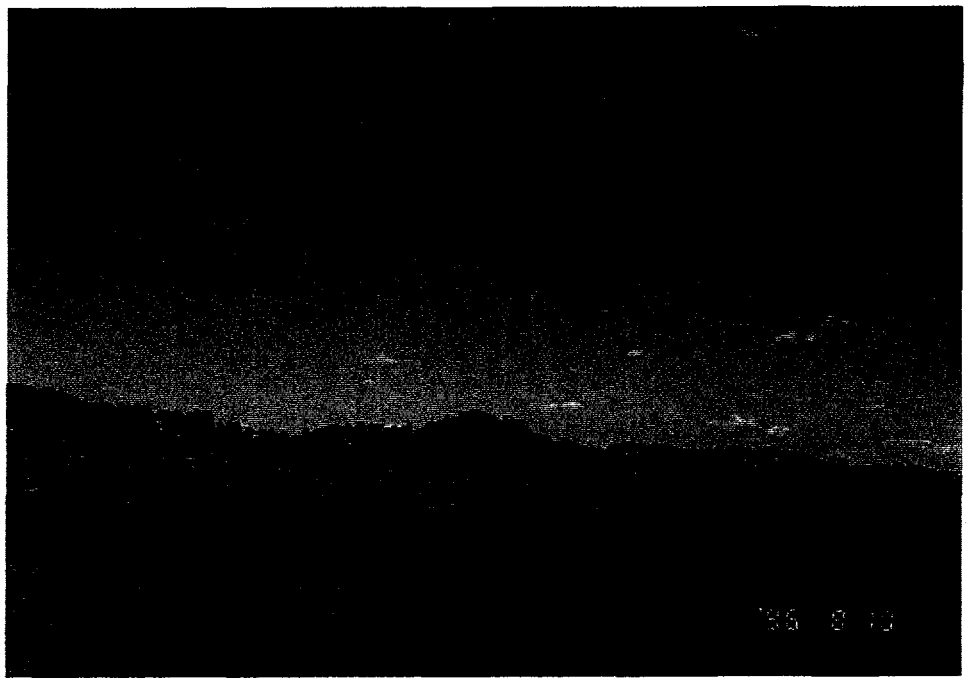
Location:	Dry Fork Ranch
Grantor:	Buck Allemand
Grantee:	Keith Johnson
Instrument:	Warranty Deed, Book 87A-34, Pages 230-234
Sale Date:	May 6, 1993, recorded May 14, 1996, Johnson County Deed Records
Legal Description:	A complete legal is available in the appraiser's file, a brief description is as follows: Township 43 North, Range 76 West, 6th P.M., Campbell County, Wyoming and Townships 43 and 44 North, Ranges 76, 77, and 78 West, 6th P.M., Johnson County, Wyoming
Price:	$1,960,000
Terms:	Cash to seller
Total Acres:	29,240 acres deeded, 1,960 acres Wyoming State Lease, 3,314 acres B.L.M. Lease for a total of 34,514 acres
Price/Deeded Acre:	$67.03
Verified By:	Pearson Real Estate
Inspected By:	James E. Wren
Access:	Gravel road
Topography:	Gently rolling to steep
Vegetation:	Native grasses and deciduous trees and brush
Water:	Artesian wells, dams, and springs
Motivation of Sale:	Arms-Length

COMPARABLE SALE NO. 3 (continued)

Effective Gross Income:	Not available
Estimated Expenses:	Not available
Net Operating Income:	Not available
Overall Rate:	Not available
Comments:	Buyer is from the Salt Lake area. Possession transferred 10/92; however, the sale did not close until 5/93. Buyer and seller were working out the details of a tax-free exchange. The ranch has 3,400 acres of land within its boundaries that are not leased at the present time and add about 100 animal units to the unit. Property is encumbered with some scattered oil wells.

ALLOCATION OF SALE

ELEMENT	ACRES/A.U.M.s	$/ACRE	$/A.U.M.	TOTAL
Grazing Land	29,240 Acres	$65		$1,900,600
State Lease	1,960/600		$50	$ 30,000
B.L.M. Lease	3,314/840		$35	$ 29,400
Improvements				-0-
TOTAL				**$1,960,000**



COMPARABLE SALE NO. 3

COMPARABLE SALE NO. 4

Location:	Thirteen miles west and eighteen miles north of Casper, Wyoming
Grantor:	Lee Coffman
Grantee:	A. L. Carlson and Rena Hanson
Instrument:	Warranty Deed
Sale Date:	April 3, 1995
Legal Description:	A complete legal is available in the appraiser's file, a brief description is of lands situated in the following: Townships 36 and 37 North, Ranges 82 and 83 West, 6th P.M., Natrona County, Wyoming
Price:	$535,000
Terms:	$35,000 down, $500,000 at 8%, 10 year term
Total Acres:	8,273 acres deeded, 147 A.U.M.s Wyoming State Lease, 1,550 acres B.L.M. Lease
Price/Deeded Acre:	$64.67
Verified By:	Steve Gleason, Farm Credit
Inspected By:	James E. Wren
Access:	Gravel road
Topography:	Rolling prairie, some steep hills and gullies
Vegetation:	Short native grasses, scattered sagebrush
Water:	Wells and reservoirs
Motivation of Sale:	Arms-Length
Effective Gross Income:	$29,496
Estimated Expenses:	$10,166

COMPARABLE SALE NO. 4 (continued)

Net Operating Income: $19,330

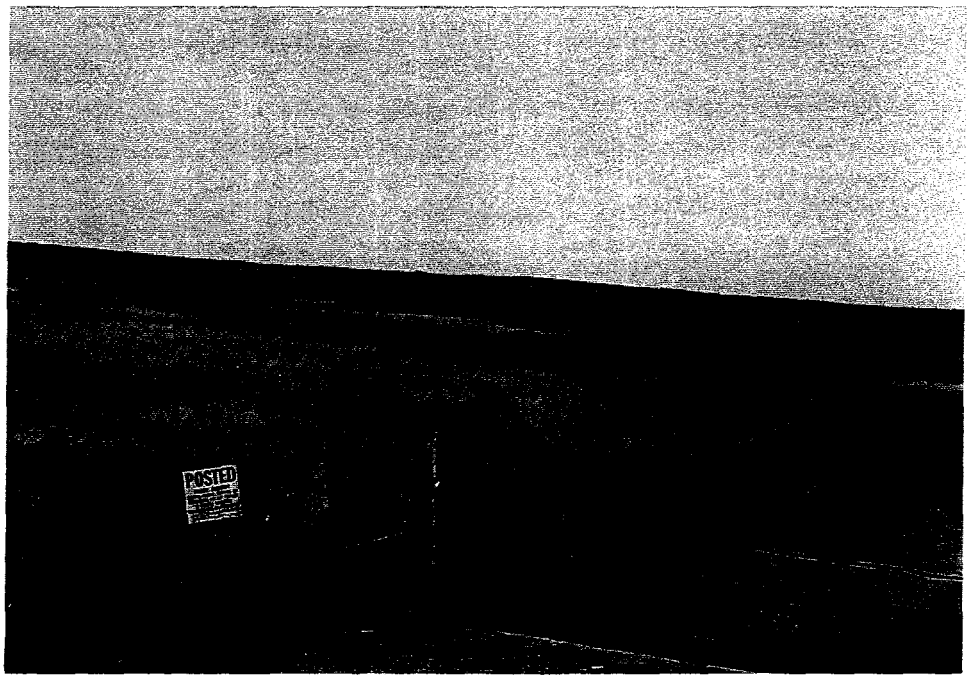
Overall Rate: 3.6%

Comments: Ranch headquarters improvements were in fair condition.

ALLOCATION OF SALE

ELEMENT	ACRES/A.U.M.s	$/ACRE	$/A.U.M.	TOTAL
Rangeland	8,273 Acres	$57.40		$474,870
B.L.M. Permit	1,550 A.U.M.s		$35	$ 54,250
Wyoming State Lease	147 A.U.M.s		$40	$ 5,880
Improvements				-0-
TOTAL				**$535,000**

COMPARABLE SALE NO. 4



COMPARABLE SALE NO. 5

Location:	Fifteen miles southwest of Pine Tree Junction
Grantor:	Meadow Creek, L.L.C.
Grantee:	Salt Creek, L.L.S.
Instrument:	Warranty deed
Sale Date:	May 6, 1993, recorded May 7, 1993
Legal Description:	A complete legal is available in the appraiser's file, a brief description is of lands situated in the following: Townships 38 and 39 North, Ranges 75, 76, and 77 West, 6th P.M., Converse County, Wyoming
Price:	$1,000,000
Terms:	Cash to seller
Total Acres:	19,960 acres deeded, 1,720 acres Wyoming State Lease, 3,360 acres B.L.M. Lease, total 25,040 acres
Price/Acre:	$50.10
Verified By:	Pearson Real Estate
Inspected By:	James E. Wren
Access:	Gravel road
Topography:	Rolling prairie, some steep bluffs and draws
Vegetation:	Native grasses, scattered sagebrush, deciduous trees and brushes
Water:	Wells and reservoirs
Motivation of Sale:	Arms-Length
Effective Gross Income:	Not available
Estimated Expenses:	Not available

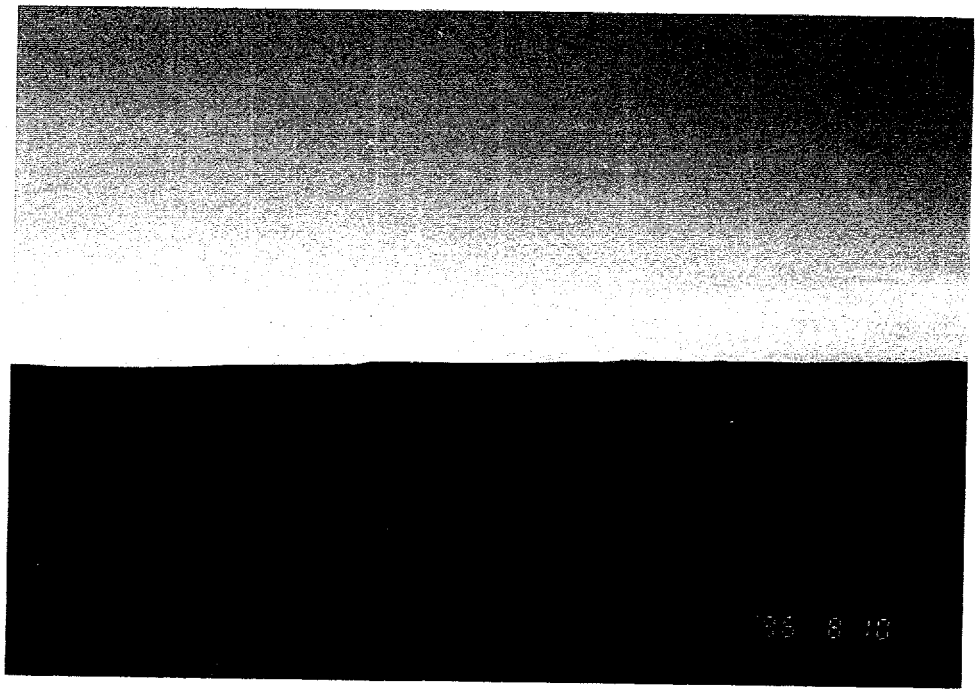
COMPARABLE SALE NO. 5 (continued)

Net Operating Income: Not available

Overall Rate: Not available

ALLOCATION OF SALE

ELEMENT	ACRES/A.U.M.s	$/ACRE	$/A.U.M.	TOTAL
Rangeland	19,960 Acres	$47.19		$941,950
B.L.M. Permit	3,360/840		$35	$ 29,400
Wyoming State Lease	1,720/573		$50	$ 28,650
Improvements				-0-
TOTAL				**$1,000,000**



COMPARABLE SALE NO. 5

COMPARABLE SALE NO. 6

Location:	35 miles southeast of Buffalo, Wyoming
Grantor:	Harriet Brothers Ltd. Partnership
Grantee:	Cat Creek Land, L.L.C.
Instrument:	Warranty Deed, Book 87A-35, Page 316
Sale Date:	February 1, 1994
Legal Description:	Township 48 North, Range 78 West, 6th P.M., Johnson County, Wyoming - Sections 7, 14, 17, 19, 29-35, and all of Sections 18 and 28; Township 47 North, Range 78 West, 6th P.M., Johnson County, Wyoming - Part of Section 1
Price:	$250,075
Terms:	Cash
Total Acres:	4,029.33 acres deeded, 5,440 acres B.L.M. Lease, 720 acres State of Wyoming Lease for a total of 10,189 acres
Carrying Capacity:	170 animal units
Access:	Fair, county roads off Interstate Highway 90 approximately 10 miles
Verified By:	Public Auction - Pearson Real Estate
Inspected By:	James E. Wren
Price/Deeded Acre:	$62.06
Price/Animal Unit:	$1,471
Topography:	Rolling hills with steep draws
Vegetation Cover:	High plains grass land, wheatgrass, grama, sagebrush, cottonwoods, occasional juniper
Water:	Four miles of creek, reservoirs, springs

COMPARABLE SALE NO. 6 (continued)

Effective Gross Income: $9,570

Estimated Expenses: $1,511

Net Operating Income: $8,059

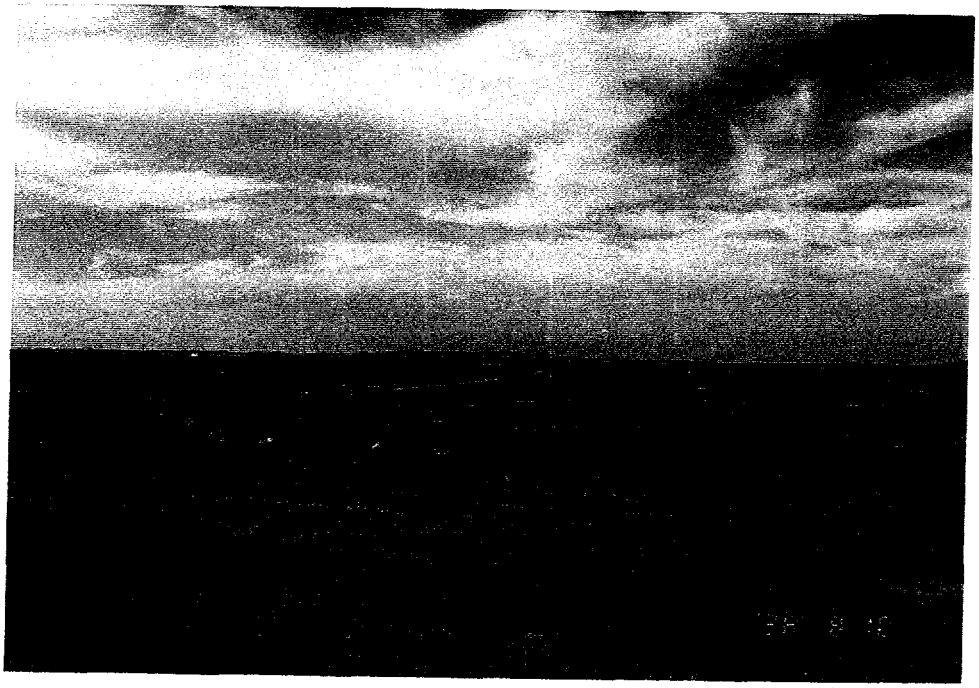
Overall Rate: 3.22%

Comments: Heavily advertised auction, purchased by "cartel" and then split, parcel 9 of 11, historically operated as wintering ground for large sheep operation, all rangeland.

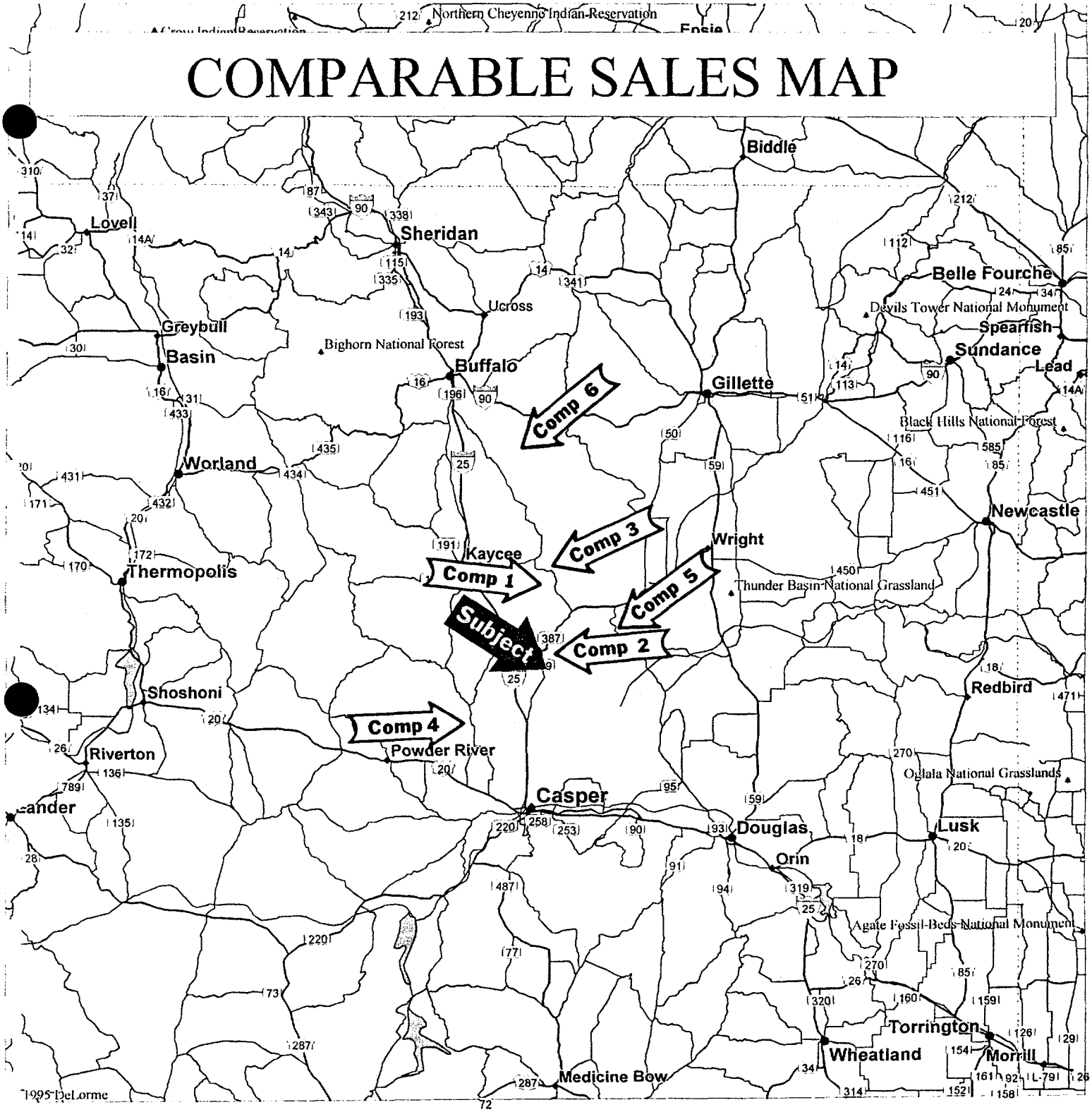
ALLOCATION OF SALE

ELEMENT	ACRES/A.U.M.s	$/ACRE	$/A.U.M.	TOTAL
Rangeland	4,029 Acres	$54.16		$214,955
B.L.M. Lease	653 A.U.M.s		$35	$ 22,855
State of Wyoming Lease	180 A.U.M.s		$50	$ 9,000
TOTAL				**$250,075**

COMPARABLE SALE NO. 6



COMPARABLE SALES MAP



ADJUSTMENT GRID OF COMPARABLE SALES

CHARACTERISTICS	SUBJECT	COMP. NO. 1	COMP. NO. 2	COMP. NO. 3	COMP. NO. 4	COMP. NO. 5	COMP. NO. 6
Address	7 Miles South of Midwest, Wyoming	2-1/2 Miles West of Linch, Wyoming	Southeast of Edgerton, Wyoming	3 Miles North of Linch, Wyoming	13 Miles West and 18 Miles North of Casper, Wyoming	15 Miles South of Pine Tree Junction Converse County, Wyoming	35 Miles Southeast of Buffalo, Wyoming
Sales Price Sales Price/Acre		$600,000 $88.56/Acre	$1,300,000 $64.17/Acre	$1,960,000 $67.03/Acre	$535,000 $64.67/Acre	$1,000,000 $50.10/Acre	$250,075 $62.06/Acre
Rights Conveyed Adjustment		Fee Simple -0-	Fee Simple -0-	Fee Simple -0-	Fee Simple -0-	Fee Simple -0-	Fee Simple -0-
Date of Sale Adjustment		3/25/95 -0-	Close 5/93 (+)$12.00/Acre	Close 5/93 (+)$8.00/Acre	4/3/95 (+)$3.88/Acre	10/92 Close 6/93 (+)$7.00/Acre	2/1/94 (+)$7.44/Acre
Location/Amenities/ Utility/Carrying Capacity Adjustment	Average	Good (-)$9.00/Acre	Average -0-	Average -0-	Inferior Access (+)$13.00/Acre	Inferior Access and Carrying Capacity (+)$13.00/Acre	Inferior Access (+)$13.00/Acre
Range Land Adjustment	9,321 Acres	6,775 Acres -0-	20,260 Acres (+)$6.50/Acre	29,240 Acres (+)$6.50/Acre	8,273 Acres -0-	19,960 Acres (+)$6.50/Acre	4,020.33 Acres -0-
State Lease - A.U.M.s Adjustment	None	None -0-	670 A.U.M.s (-)$2.00/Acre	840 A.U.M.s (-)$1.00/Acre	147 A.U.M.s (-)$0.71/Acre	570 A.U.M.s (-)$1.44/Acre	180 A.U.M.s (-)$2.23/Acre
B.L.M. Lease - A.U.M.s Adjustment	None	589 A.U.M.s (-)$3.00/Acre	3,040 A.U.M.s (-)$5.25/Acre	840 A.U.M.s (-)$1.03/Acre	1,550 A.U.M.s (-)$6.56/Acre	840 A.U.M.s (-)$1.47/Acre	653 A.U.M.s (-)$5.67/Acre
Improvements (Contributory Value) Adjustment	None	None -0-	Headquarters Building (-)$2.50/Acre	None -0-	$35,000 (-)$4.23/Acre	None -0-	None -0-
Total Adjustments		(-)$12.00/Acre	(+)$8.75/Acre	(+)$12.47/Acre	(+)$5.38/Acre	(+)$23.59/Acre	(+)$12.54/Acre
Indicated Value/Acre for Subject		$76.56/Acre	$72.92/Acre	$79.50/Acre	$70.05/Acre	$73.69/Acre	$74.60/Acre
Indicated Value for Subject		$713.616	$679,687	$741,020	$652,936	$686,864	$695,347

ANALYSIS OF THE COMPARABLE SALES

The six sales listed sold in a price range of $250,075 to $1,960,000 with a per acre range of $50.10/acre to $88.56/acre. Fully adjusted, the sales indicate a per acre value range for the subject of $70.05/acre to $79.50/acre with a mean of $74.55/acre. Sales No. 1, No. 2, and No. 3 are located in the immediate area of the subject and are encumbered with oil wells similar to the subject. These three sales are considered to be the best indicators of the subject's market value and indicate a price per acre range of $72.92/acre to $79.50/acre for the subject and the appraiser has selected $75.00/acre as the price per acre for the subject.

FINAL ESTIMATE OF MARKET VALUE

Based on the foregoing data, analysis, and conclusions, the "as is" market value for the subject land, excluding any value for the oil reserves, mineral rights, and surface structural improvements and equipment, as of July 27, 1996, is estimated to be:

$75.00/acre x 9,321 acres = $ 699,075

Rounded To: **$ 699,000**

SIX HUNDRED NINETY NINE THOUSAND DOLLARS

$699,000

TIME TO MARKET

Based on current market conditions, the subject property should sell for the appraised value within one year or less if the property is exposed to the market.

CERTIFICATION

I certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct.

2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions, and conclusions.

3. I have no present or prospective interest in the property that is the subject of this report and I have no personal interest or bias with respect to the parties involved.

4. My compensation is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event.

5. This appraisal was not based on a requested minimum valuation, a specific valuation, or the approval of a loan.

6. My analyses, opinions, and conclusions were developed, and this report has been prepared in conformity with the Uniform Standards of Professional Appraisal Practice.

7. I have made a personal inspection of the property that is the subject of this report.

8. No one provided significant professional assistance to the person signing this report.

9. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and the Standards of Professional Appraisal Practice of the Appraisal Institute.

10. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

11. As of the date of this report, I have completed the requirements of the continuing education program of the Appraisal Institute.

James E. Wren

James E. Wren, SRA, SRPA
Certified General Appraiser Permit No. 15

QUALIFICATIONS OF JAMES E. WREN, SRA, SRPA

Real Estate Appraiser

Formal Education:	Hillsboro College, Hillsboro, TX University of Wyoming, Laramie, WY
Appraisal Experience:	Fee Appraiser - 21 years
Business Position:	Owner/Appraiser - James E. Wren Company
Appraisal Courses: Successfully Passed:	SREA: Course 101 "An Introduction to Appraising Real Property" SREA: Course 102 "Applied Residential Property Valuation" SREA: Course 201 "Principles of Income Property Appraising" SREA: Course 202 "Applied Income Property Valuation" Appraisal Institute Courses 410 and 420 Uniform Standards of Professional Appraisal Practice and Ehtics
Professional Memberships:	Member - APPRAISAL INSTITUTE (Effective January 1, 1991, the Society of Real Estate Appraisers and the American Institute of Real Estate Appraisers merged to create the Appraisal Institute.)
Professional Designations:	"SRA" - Senior Residential Appraiser "SRPA" - Senior Real Property Appraiser "Wyoming Certified General Real Estate Appraiser" (Permit No. 15)
Offices Held:	Wyoming Chapter of the Appraisal Institute President - 1990 Director - 1983-1991, 1993-1995 Education Chairman - 1983, 1984, 1988, 1989 Director, Casper Board of Realtors - 1994-1996 Board Member - Wyoming Certified Appraisal Board - 1995-1998
Association Memberships:	National Association of Realtors Casper Board of Realtors Casper Multiple Listing Service Licensed Wyoming Real Estate Broker Member, FHA fee Panel
Qualified Experience:	I am qualified and have experience in appraising the following type of properties: (1) Single Family Residential Units (2) Condominiums - Existing and Proposed (3) 1 - 4 Family and Multi Unit Apartments

(4) Commercial and Industrial properties, including warehouses, shops, office buildings, motels, hotels, service stations, and retail stores.
(5) Raw land
(6) Subdivisions
(7) Ranches and farms
(8) Businesses as "Going Concerns" in their entirety
(9) Eminent Domain appraisals for condemnation proceedings
(10) Tax and estate cases

Qualifications as an Expert Witness:

U.S. District Court - Cheyenne, WY
U.S. District Court - Casper, WY
Wyoming District Court - Casper, WY
Wyoming District Court - Douglas, WY

Continuing Education:

The Appraisal Institute (formerly the Society of Real Estate Appraisers) conducts a voluntary program of continuing education for its designated members. Designated Members who meet the minimum standards of this program are awarded periodic education certification. As of the date of this report, I, James E. Wren, have completed the requirements under the continuing education program of the Appraisal Institute, and am certified through December 31, 1998.

Continuing Education Courses:

Appraising Rural Residential Properties
The American Society of Farm Management and Rural Appraisers
Riverton, Wyoming, April 24-26, 1996

Advanced Cost Approach
Wyoming Appraisal Board
Casper, Wyoming, October 12-14, 1995

Uniform Standards and Ethics of Professional Appraisal Practice - Parts A & B
Appraisal Institute
Sheridan, Wyoming, August, 1995

Appraisal From Blueprints and Specifications
Appraisal Institute
Casper, Wyoming, May 19, 1995

HUD/FHA Annual Appraiser Training Seminar
Casper, Wyoming
January 26, 1995

Fair Lending and the Appraiser
Appraisal Institute
Casper, Wyoming, January 6, 1995

Uniform Standards and Ethics of Professional Appraisal Practice - Parts A & B
Appraisal Institute
Reno, Nevada, July, 1994

Subdivision Analysis
Appraisal Institute
Deadwood, South Dakota, June, 1994

Departure Provisional of "USPAP"
Appraisal Foundation
Rapid City, South Dakota, April, 1994

The New Uniform Residential Real Estate Appraisal Report (URAR)
Appraisal Institute
Casper, Wyoming, January, 1994

American Society of Farm Managers and Rural Appraisers' Highest an Best Use
Appraisal Institute and ASFMRA
August, 1993

HUD/FHA Annual Appraisers Training Seminar
U. S. Dept. of Housing & Urban Development
Casper, Wyoming, March, 1993

Government Regulations
Appraisal Institute
Jackson, Wyoming, September, 1992

Written Communications
Appraisal Institute
Saratoga, Wyoming, June, 1992

Appraisal Conservation and Preservation Easements
Appraisal Institute
Jackson, Wyoming, September, 1991

State Appraiser Certification Examination Preparation Seminar/Commercial and Residential
Society of Real Estate Appraisers
Casper, Wyoming, September, 1990

Residential Appraisal Report From the User's Perspective
Society of Real Estate Appraisers
Orlando, Florida, August, 1990

Appraisal Regulations of the Federal Banking Agency
Society of Real Estate Appraisers
Orlando, Florida, August, 1990

Real Estate Appraisal Reform
Office of Thrift Supervision
Cheyenne, Wyoming, August, 1990

Appraisal Review
Society of Real Estate Appraisers
Las Vegas, Nevada, April, 1990

FIRREA and the Appraiser
Society of Real Estate Appraisers
Las Vegas, Nevada, April, 1990

Asbestos Awareness Clinic
Society of Real Estate Appraisers
Casper, Wyoming, January, 1990

Valuation Using Spreadsheets
Society of Real Estate Appraisers
Casper, Wyoming, September, 1988

Reviewing Appraisals
Appraisal Institute
Jackson, Wyoming, September, 1992

Americans with Disabilities Act
Appraisal Institute
Jackson, Wyoming, September, 1992

Comprehensive Real Estate Appraisal Workshop
Appraisal Institute, Whitmar Seminars
Reno, Nevada, August, 1991

Development of a Golf Course Community
Society of Real Estate Appraisers
Orlando, Florida, August, 1990

Investment Criteria of Purchasers of Major Commercial Property
Society of Real Estate Appraisers
Orlando, Florida, August, 1990

The Expert Witness
Society of Real Estate Appraisers
Orlando, Florida, August, 1990

Standards of Professional Practice and Conduct
Society of Real Estate Appraisers
Casper, Wyoming, July, 1990

Equity Residual Analysis
Society of Real Estate Appraisers
Las Vegas, Nevada, April, 1990

Relocation Appraising in the Declining Market
Society of Real Estate Appraisers
Las Vegas, Nevada, April, 1990

Environmental Hazards in Real Estate
Wyoming Real Estate Commission
Casper, Wyoming, March, 1990

Demonstration Appraisal Report
Society of Real Estate Appraisers
Casper, Wyoming, September, 1989

Provisions of 1986/1987 Tax Reform Act Affecting Real Estate
American Society of Farm Managers and Rural Appraisers
Casper, Wyoming, January, 1988

Standards of Professional Practice and Conduct
Society of Real Estate Appraisers
Cheyenne, Wyoming, January, 1988

Real Estate Finance/Real Estate Appraisal and Real Estate Property Management
Wyoming Institute of Real Estate
Casper, Wyoming, December, 1986

Federal Home Loan Bank Board Memorandum "R-41B and the Appraiser"
Society of Real Estate Appraisers
Denver, Colorado, 1985

Adjusting for Financial Differences in Residential Properties (Cash Equivalency Concept)
Society of Real Estate Appraisers
Denver, Colorado, March, 1982

Use and Understanding of the Marshall Valuation Service
Marshall/Swift Publication Company
Denver, Colorado, 1982

Appraising Residential Condominiums
Society of Real Estate Appraisers
Colorado Springs, Colorado, April, 1980

Federal Home Loan Bank Board's Memorandum "R-41C"
Presented by FHLB Appraiser and Wyoming Savings and Loan League
Casper, Wyoming, February, 1987

Maximizing the Potential of the HP-12C Calculator in Income Property Analysis
Northwest Center for Professional Education
Denver, Colorado, August, 1986

Real Estate Law and Practice
Del Monte School of Real Estate
Casper, Wyoming, November, 1983

Uniform Energy Ratio Systems
Western Resources Institute/Savings and Loan League
Casper, Wyoming, 1982

Appraisal of Multi-Family and PUD Properties
Freddie Mac Seminar
Denver, Colorado, 1982

Numerous Seminars Offered by the Society of Real Estate Appraisers, the Appraisal Institute, National Association of Review Appraisers, (HUD) the United States Department of Housing and Urban Development, (FNMA) Federal National Mortgage Insurance Company, and (FSLIC) Federal Savings and Loan Insurance Company.

Partial List of Appraisal Clients during the past five years have included:

First Interstate Bank, Casper
Key Bank of Wyoming
Hilltop National Bank
Republic National Bank, Dallas, TX
Riverton State Bank
First National Bank, Thermopolis, WY
Commerce National Bank, Houston, TX
First National Bank, Evanston, WY
1st Federal Savings Bank, Sheridan, WY
Sheridan National Bank
First Interstate Bank of Commerce, Sheridan, WY
Bank of Oklahoma
First National Bank in Bartlesville
Bank of Saint Louis
United Bank of Denver
Stockgrowers State Bank, Worland, WY
Rocky Mountain Bank, F.S.B.
U.S. Small Business Administration
FDIC
FSLIC
Wyoming Industrial Development Corp.
Executrans Personalized Relocation
Mountain States Builders
American Builders
ChemExec Relocation Systems, Inc.
Marvin L. Bishop, Attorney at Law
Lawrence Middaugh, Attorney at Law
Edward S. Halsey, Attorney at Law
John Burk, Attorney at Law
Gloria J. Monroe, Attorney at Law
Margo Sabec, Attorney at Law
John A. Warnick, Attorney at Law
Joe R. Wilmetti, Attorney at Law
Farm Credit Services
Federal National Mortgage Association
General Motors Corporation
Westinghouse
Diamond Shamrock
Texaco, Inc.
U.S. Steel Corporation
Pacific Power and Light Company
Exxon Corporation
E.I. DuPont Company
Merrill Lynch Relocation
Equitable Relocation Company
Van Relco Relocation
PHH Homequity Relocation
Better Homes and Gardens Relocation
BetaWest Relocation
Genesis Relocation
Transamerica Relocation
Western Relocation Management, Inc.
Continental Oil Company
Department of Environmental Quality
Farmers Home Administration

ADDENDA

JAMES E. WREN COMPANY
Real Estate Appraisers and Consultants
341 East "E" Street
Suite 260
Casper, Wyoming 82601
(307) 266-2610

July 25, 1996

Mr. John B. Gustavson, President
Gustavson Associates
Geologists and Engineers
5757 Central Avenue, Suite "D"
Boulder, Colorado 80301

RE: Appraisal Request

Dear Mr. Gustavson:

Per our conversation of July 24, 1996, I have outlined below my understanding of your request for me to furnish your company with a range of value for the surface rights of approximately 10,000 acres of land located approximately twenty miles north of Casper, Natrona County, Wyoming.

Client:	Gustavson and Associates 5757 Central Avenue, Suite "D" Boulder, Colorado 80301
Appraiser:	James E. Wren, SRPA, SRA
Assignment:	The assignment is to arrive at a supportable and defensible range of the market value for the surface rights of the subject property.
Legal Description of the Property to be Appraised:	The property to be appraised is the U. S. Naval Reserve land known as the Tea Pot Dome Oil Field. The client is to furnish the appraiser with a complete legal description.
Appraisal Request:	The appraiser is requested to perform a Limited Appraisal - Summary Format as allowed by the Departure Provisions of the Uniform Standards of Professional Appraisal Practice (U.S.P.A.P.).
Rights to be Appraised:	The fee simple interest of the subject land, excluding any mineral rights, or equipment in place for the production of minerals, oil, or natural gas.
Definition of Market Value:	The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably, and assuming the price is not affected by undue stimulus.

James E. Wren, SRA, SRPA

Implicit in this definition is the consummation of a sale as of a specified date and the passing of title or bill of sale from seller to buyer under all conditions whereby:

1. Buyer and seller are typically motivated;

2. Both parties are well informed or well advised and each acting in what he consider his own best interest;

3. A reasonable time is allowed for exposure in the open market;

4. Payment is made in terms of cash in U. S. dollars or in terms of financial arrangements comparable thereto; and

5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

Purpose of the Appraisal: The purpose of this appraisal is to assist the client, Gustavson and Associates in their efforts of appraising the total subject property including any minerals, oil, and gas located on the subject property.

Access to Subject Property: The client is to arrange permission for the appraiser to inspect the subject property.

Appraisal Fee: $2,500.00

Due Date: My report is expected to be delivered to the client by August 10, 1996.

Standards of Appraisal:

A. Provide, as appropriate, the highest and best use analysis for the Subject Property;

B. Conform to the Uniform Standards of Professional Appraisal Practice (U.S.P.A.P.) as adopted by the Appraisal Standards Board of the Appraisal Foundation with emphasis on confidentiality.

Confidentiality - The engagement letter and the Appraisal and any information provided by Client to Appraiser is confidential and may not be disclosed to any party or referred to in any other assignment given the Appraiser without Client's express written permission.

C. Be written and presented in a format that satisfies the requirements of the engagement;

D. Indicate the current owner and the ownership of the Subject Property for the three (3) previous years. Analyze and report in reasonable detail, any prior sales of the property being appraised that occurred within three (3) years, preceding the effective date of the Appraisal;

E. Include in the Certification required by U.S.P.A.P. an additional statement, as required by F.I.R.R.E.A. that the appraisal assignment was not based on a requested minimum valuation, a specific valuation, or the approval of a loan;

F. Contain sufficient supporting documentation, with all pertinent information reported, so that the Appraiser's logic, reasoning, judgement, and analysis in arriving at a conclusion indicates the reasonableness of the value reported to the reader;

G. Include a legal description of the real estate being appraised, in addition to the description required by U.S.P.A.P.

CLIENT

President
GUSTAVSON ASSOCIATES
5757 Central Avenue, Suite "D"
Boulder, Colorado 80301

APPRAISER

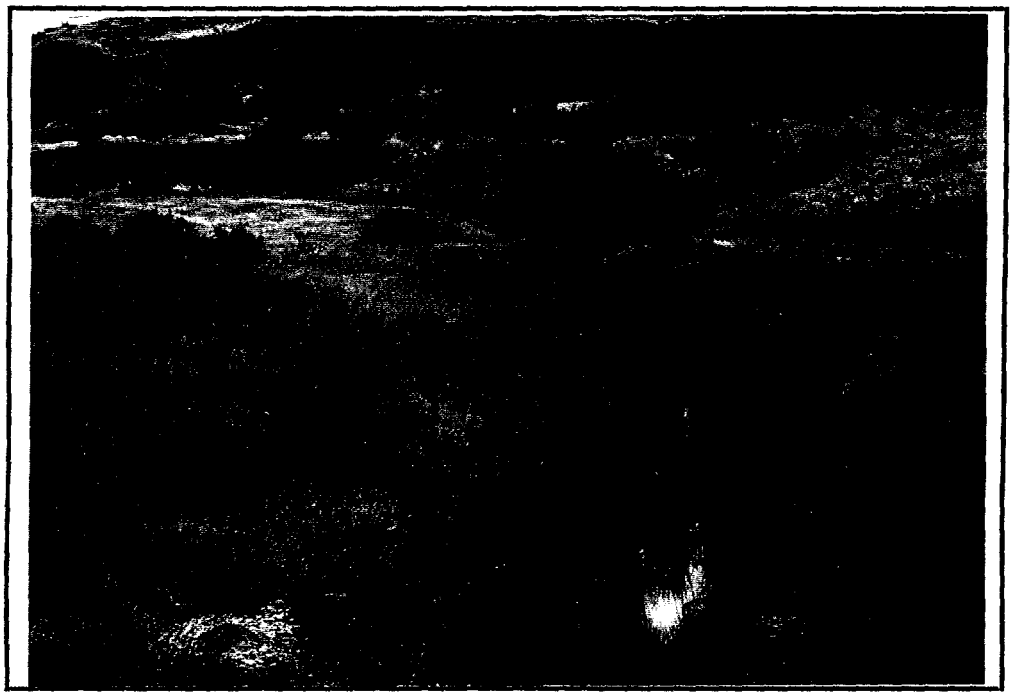
President
JAMES E. WREN COMPANY, INC.
341 East "E", Suite 260
Casper, Wyoming 82601

Sincerely,

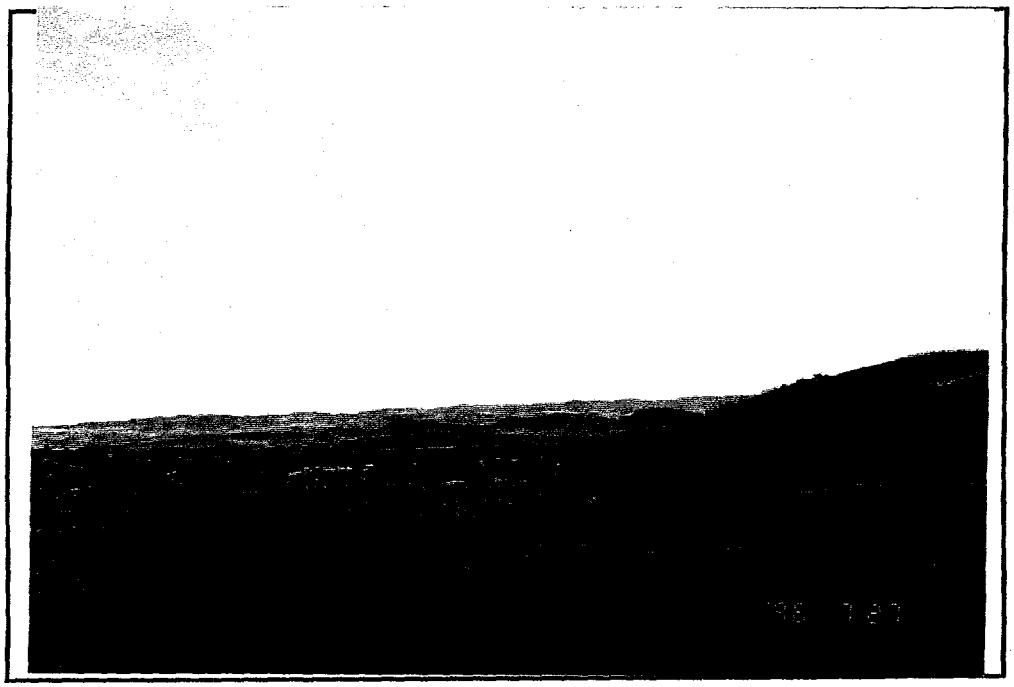
James E. Wren, SRA, SRPA

JEW/njg

SUBJECT PROPERTY



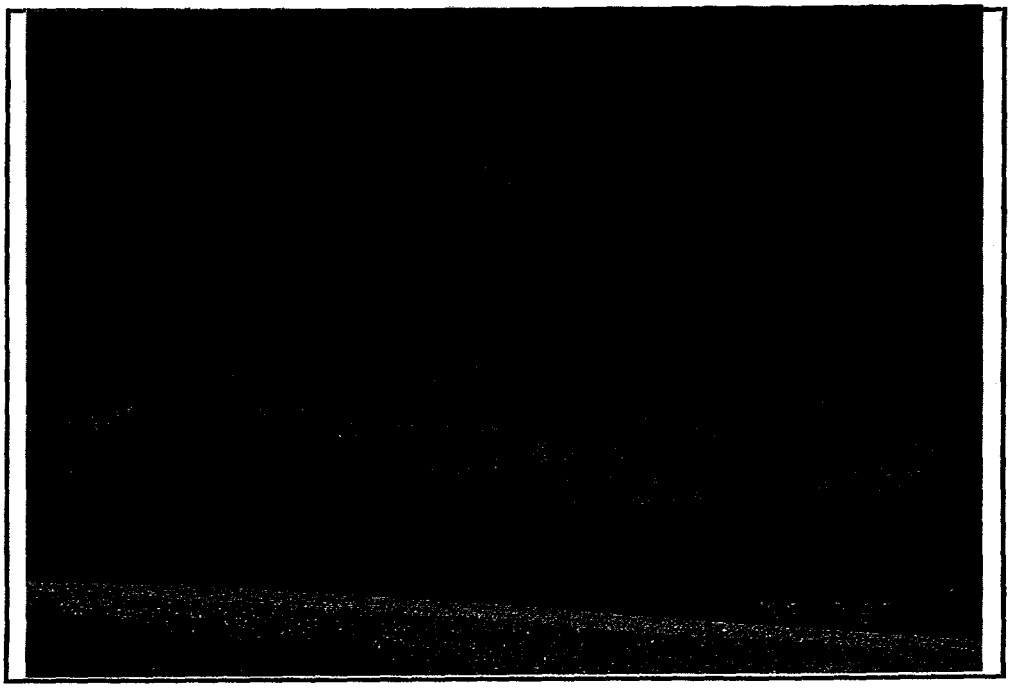
TEAPOT CREEK



LOOKING NORTHEAST FROM TEAPOT CREEK AND THE MAIN ROAD

SUBJECT PROPERTY

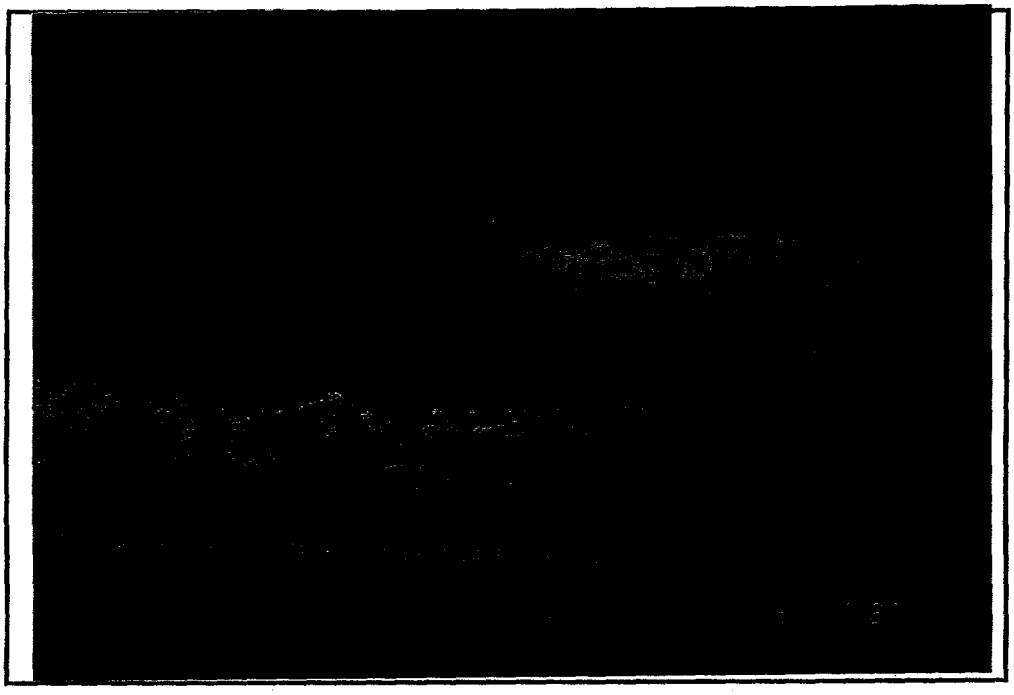
LOOKING SOUTHWEST FROM TEAPOT CREEK AND THE MAIN ROAD



LOOKING SOUTHWEST AT THE RIDGE ON THE NE/4SE/4 OF SECTION 29

SUBJECT PROPERTY

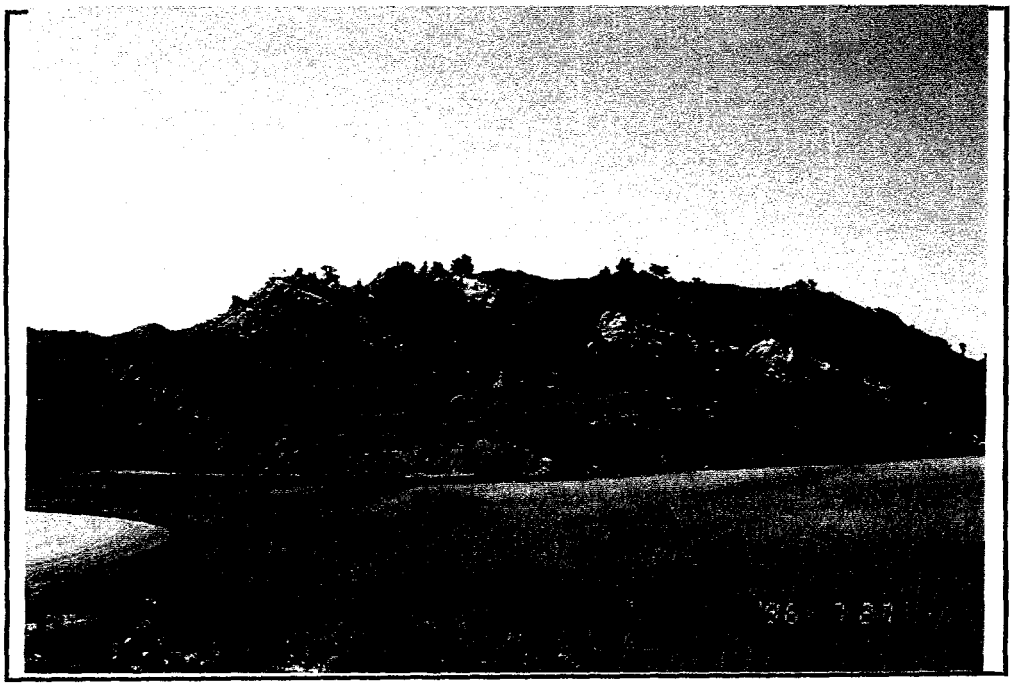
LOOKING SOUTHEAST FROM APPROXIMATELY 1/4 MILE NORTH OF GAS PLANT



LOOKING SOUTH FROM APPROXIMATELY 1/4 MILE NORTH OF GAS PLANT

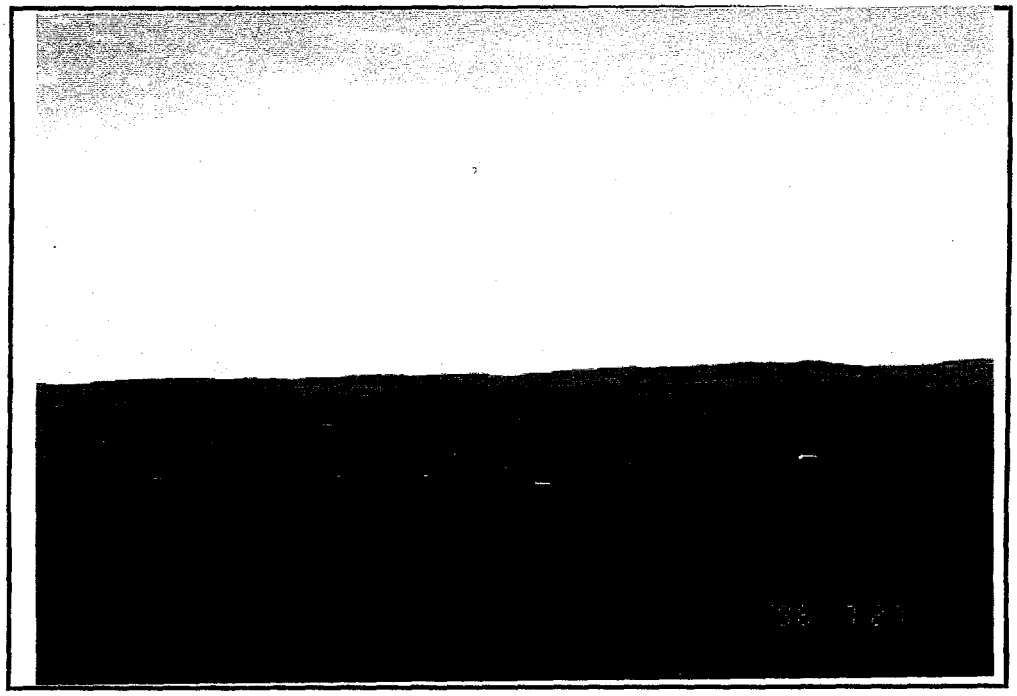
SUBJECT PROPERTY

LOOKING NORTH AT GAS PLANT

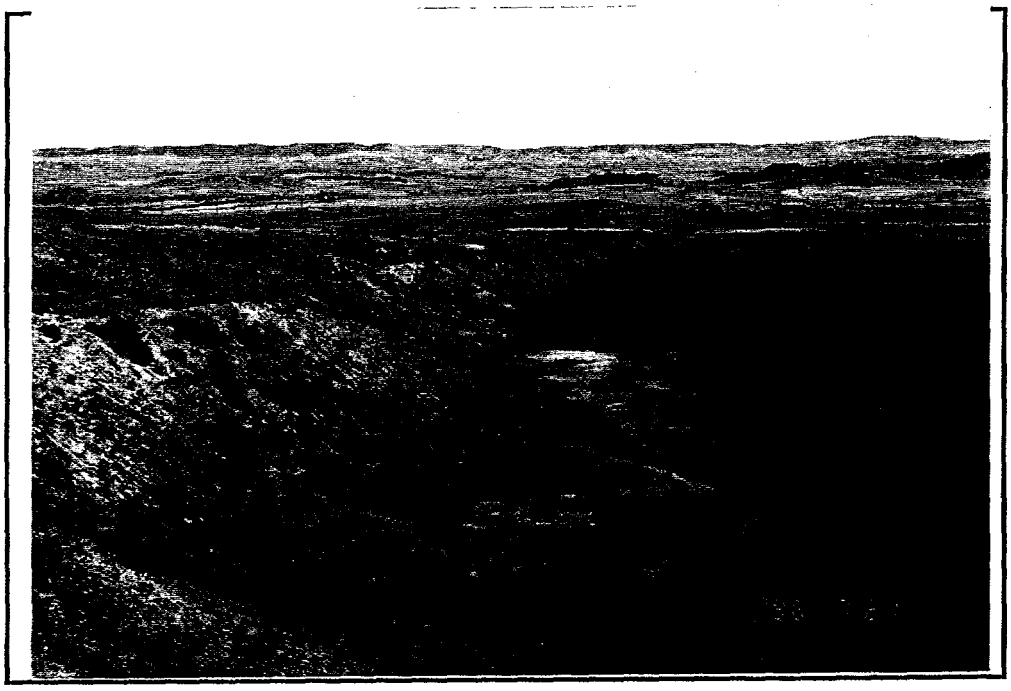


BLUFF EAST OF GAS PLANT

SUBJECT PROPERTY



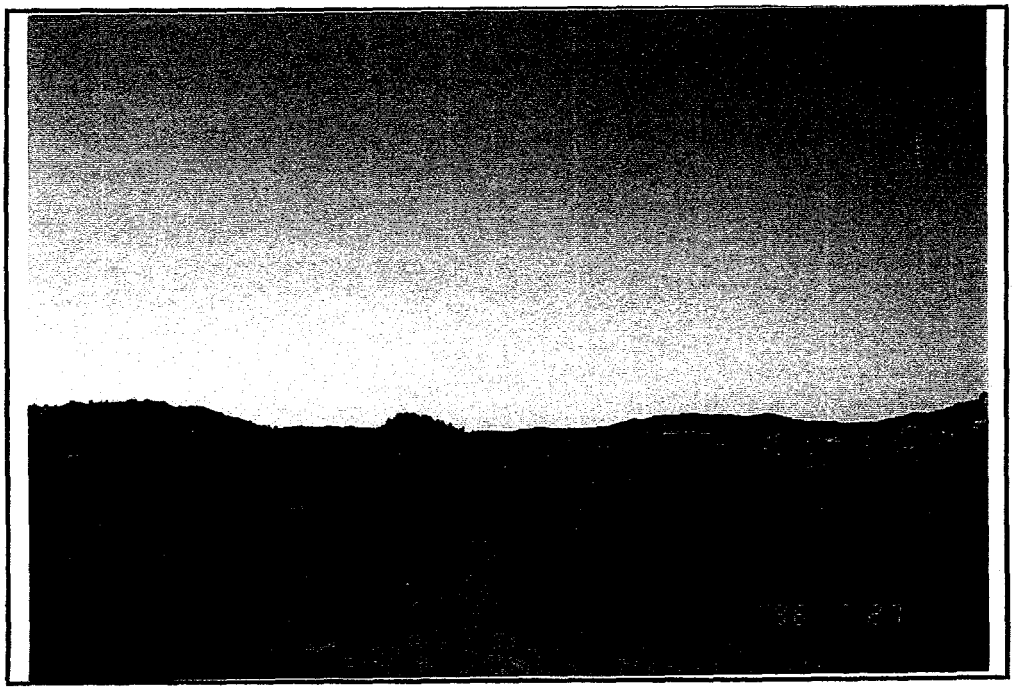
LOOKING EAST FROM THE NORTHWEST CORNER OF SECTION 2



CREEK NEAR OFFICE/SHOP

SUBJECT PROPERTY

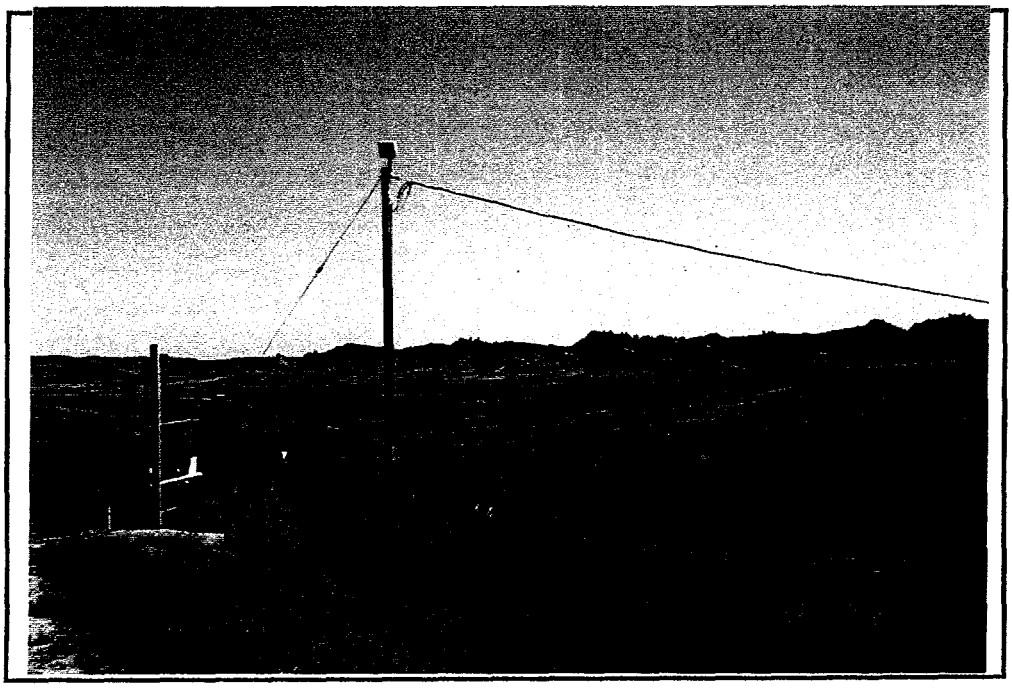
POND NEAR OFFICE/SHOP



LOOKING SOUTH FROM THE NORTHWEST CORNER OF SECTION 2

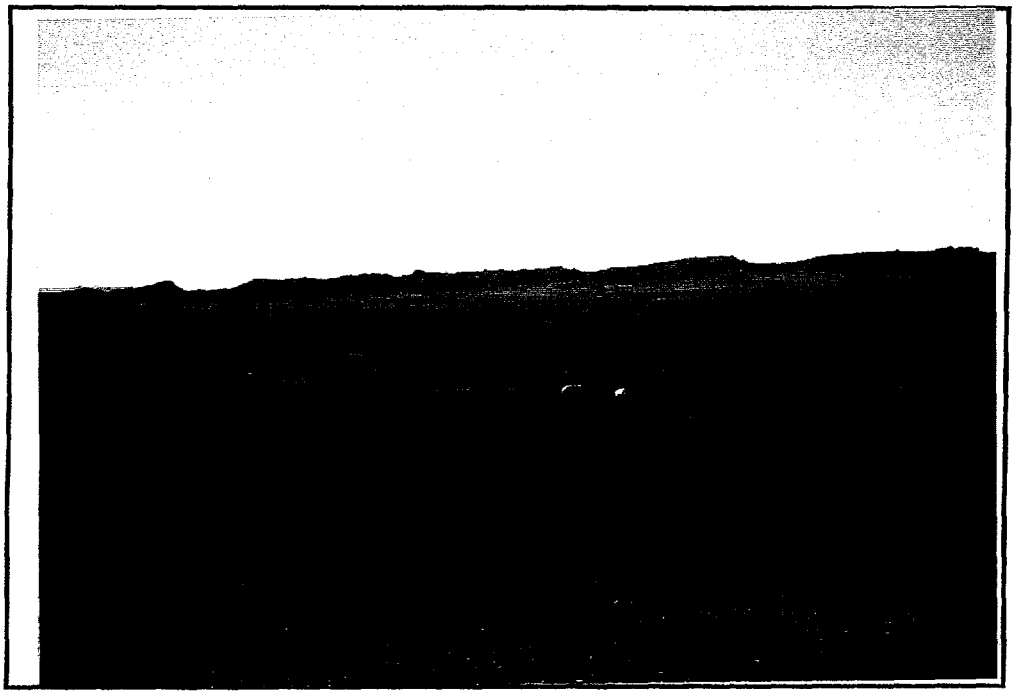
SUBJECT PROPERTY

SAGE CREEK LOOKING SOUTHWEST



SAGE CREEK LOOKING NORTHEAST

SUBJECT PROPERTY

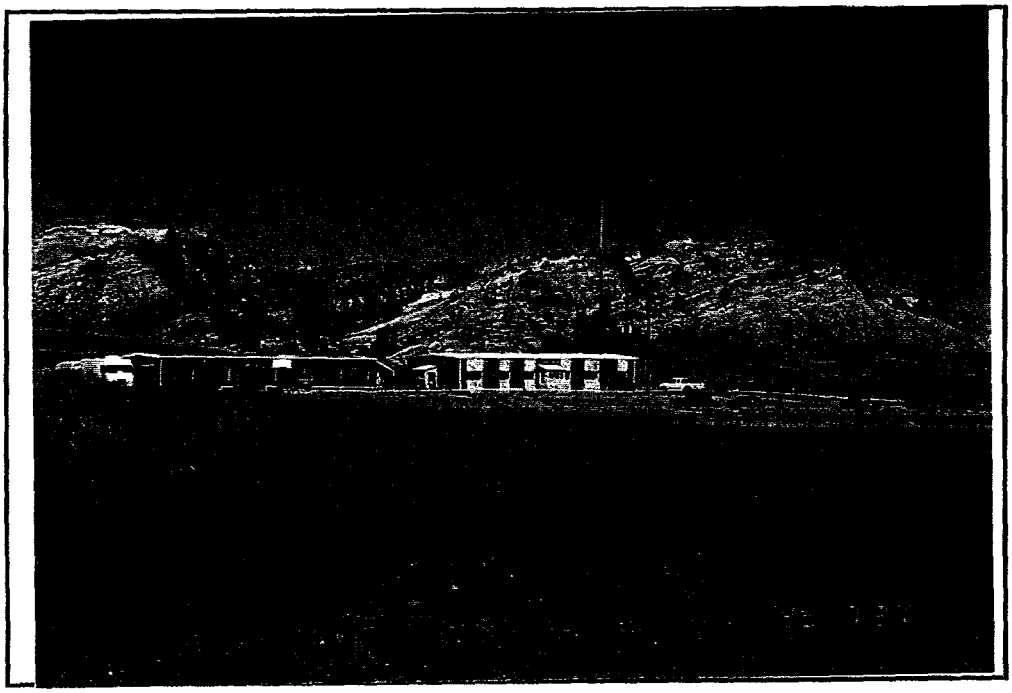


LOOKING EAST FROM JUST SOUTH OF CAMP

LOOKING NORTH FROM WELL NO. 55 STX 23

SUBJECT PROPERTY

VIEW OF
OFFICE/CAMP



VIEW OF
OFFICE/CAMP

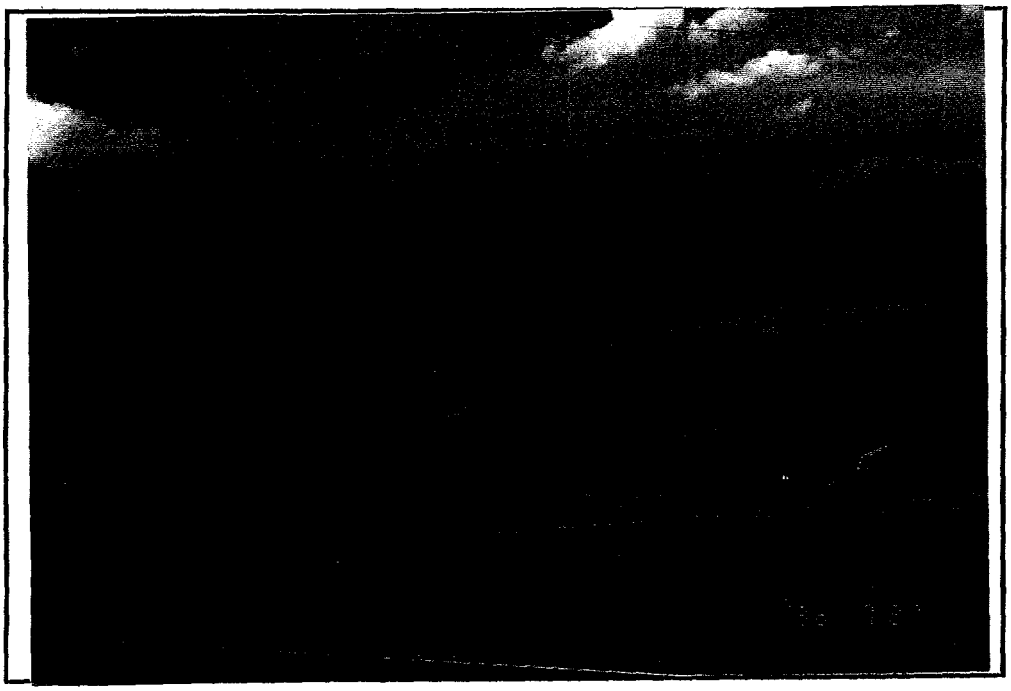
SUBJECT PROPERTY

LOOKING SOUTHWEST FROM APPROXIMATELY 1/4 MILE NORTH OF GAS PLANT

LOOKING NORTHEAST ON THE NE/4SE/4 OF SECTION 29

SUBJECT PROPERTY

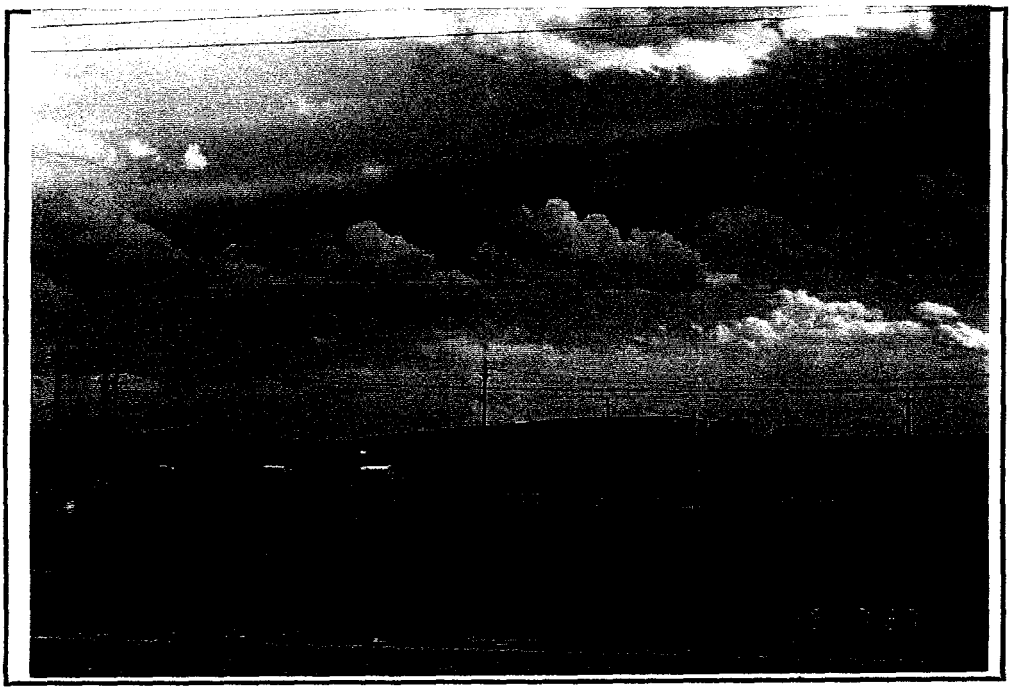
LOOKING SOUTHWEST FROM THE INTERSECTION OF HIGHWAY 87 AND 387



LOOKING WEST FROM U. S. HIGHWAY 87 SOUTH OF MIDWEST

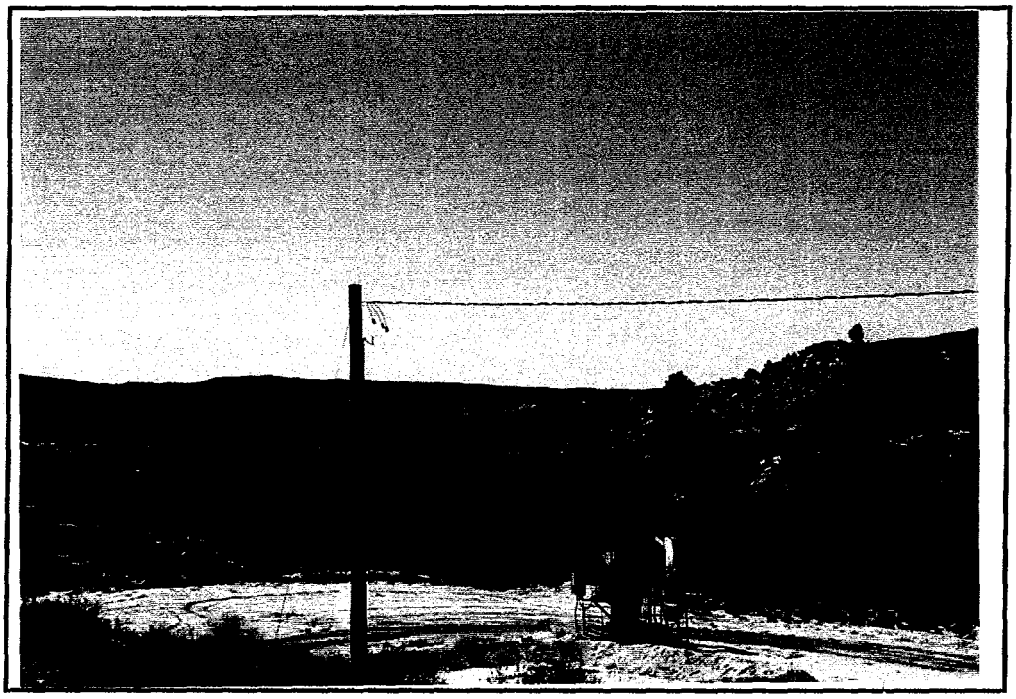
SUBJECT PROPERTY

LOOKING NORTHEAST FROM THE SOUTH BOUNDARY AND U. S. HIGHWAY 87

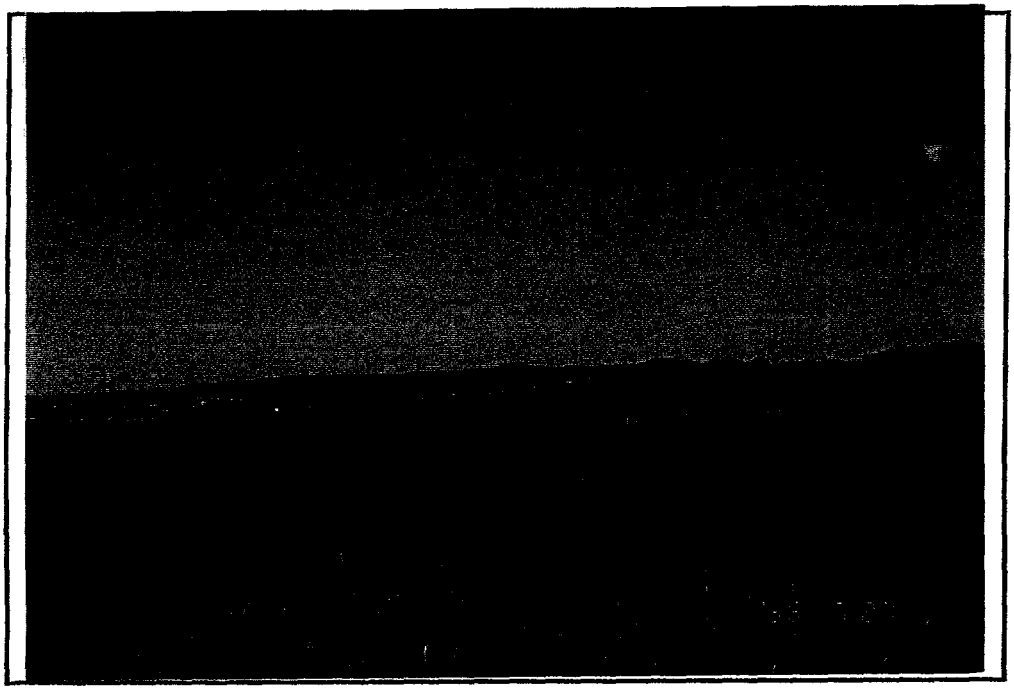


LOOKING SOUTHEAST FROM INTERSECTION OF HIGHWAY 87 AND HIGHWAY 387

SUBJECT PROPERTY



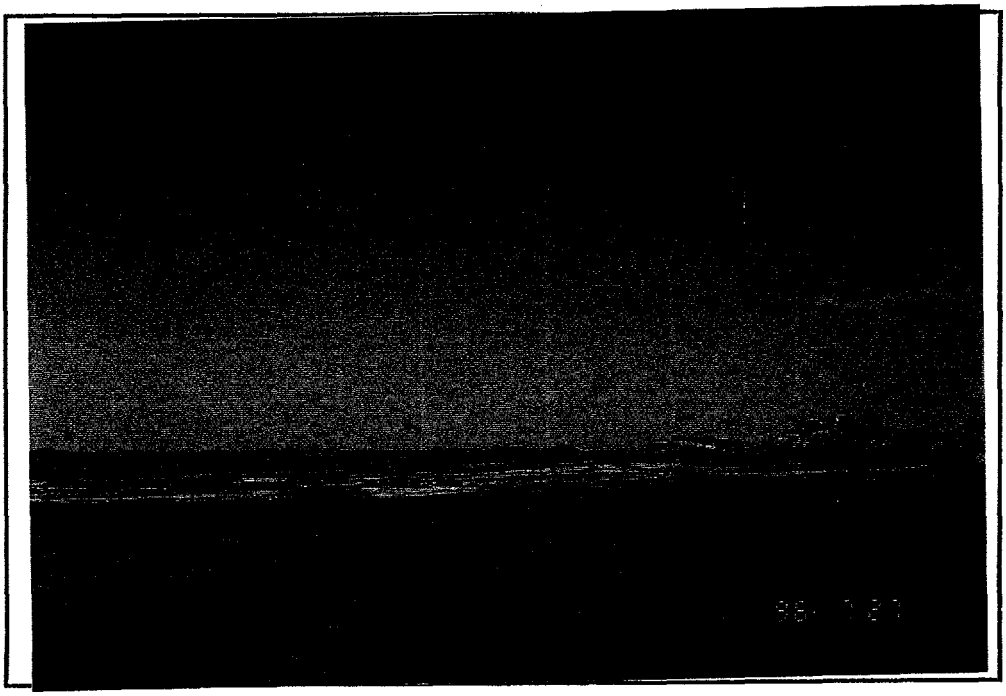
LOOKING SOUTH FROM
WELL 22 STX 26



LOOKING NORTH FROM
WELL 15 STX 14

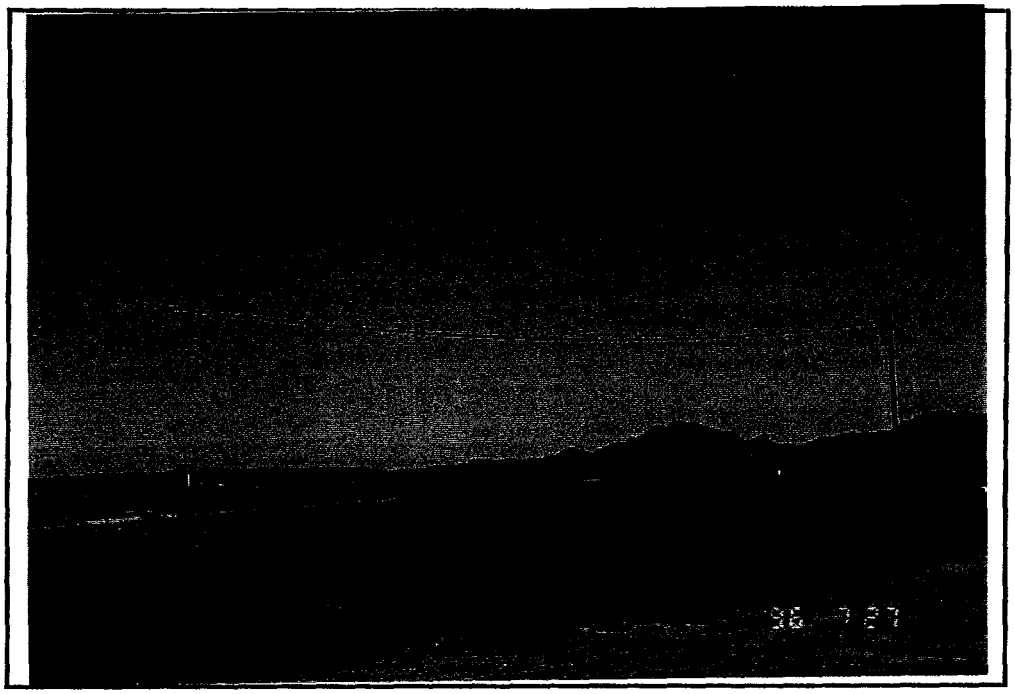
SUBJECT PROPERTY

LOOKING NORTH FROM THE SOUTH BOUNDARY OF SECTION 2



VIEW FROM EAST BOUNDARY ADJACENT TO GLX ENERGY SHOP

SUBJECT PROPERTY

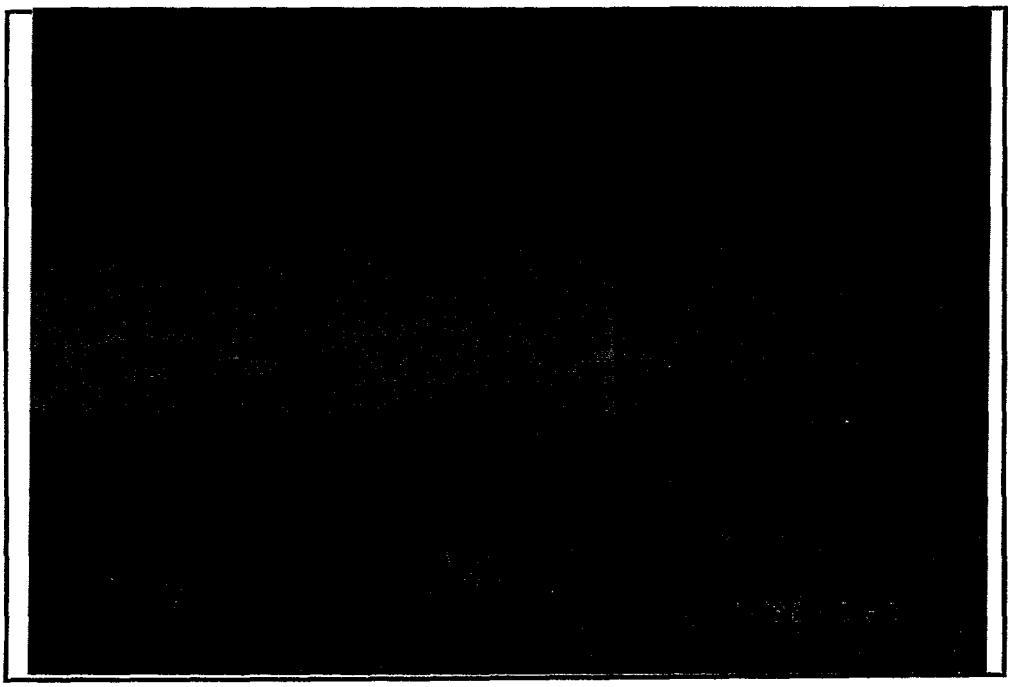


LOOKING NORTH FROM
64-65 STX 10

LOOKING SOUTH FROM
85 STX 11

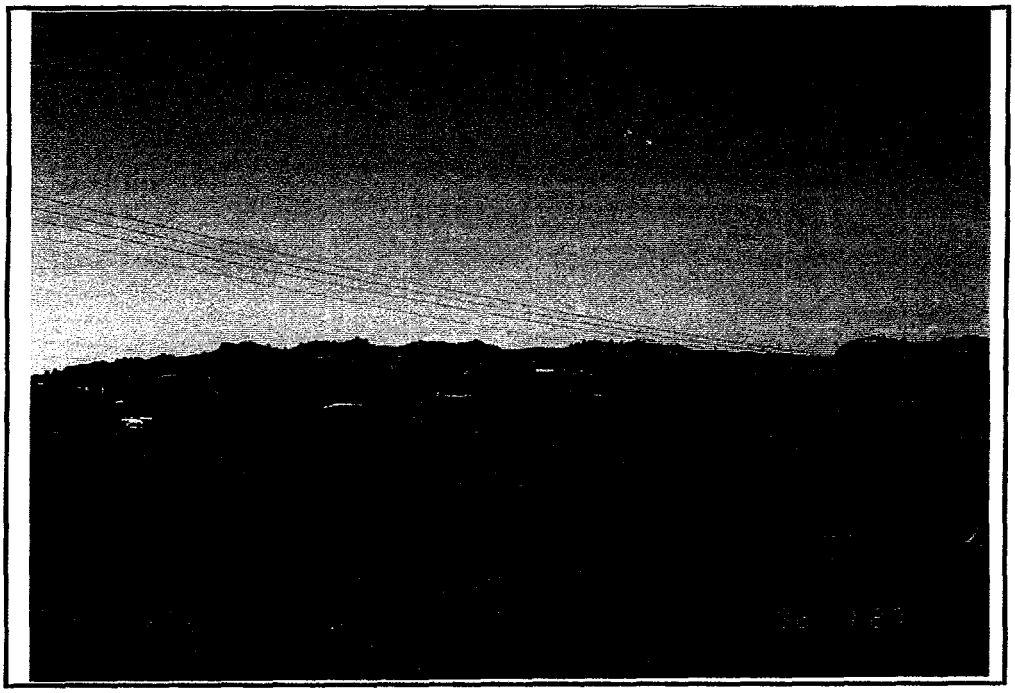
SUBJECT PROPERTY

LOOKING NORTHWEST
FROM BATTERY
B-1-35

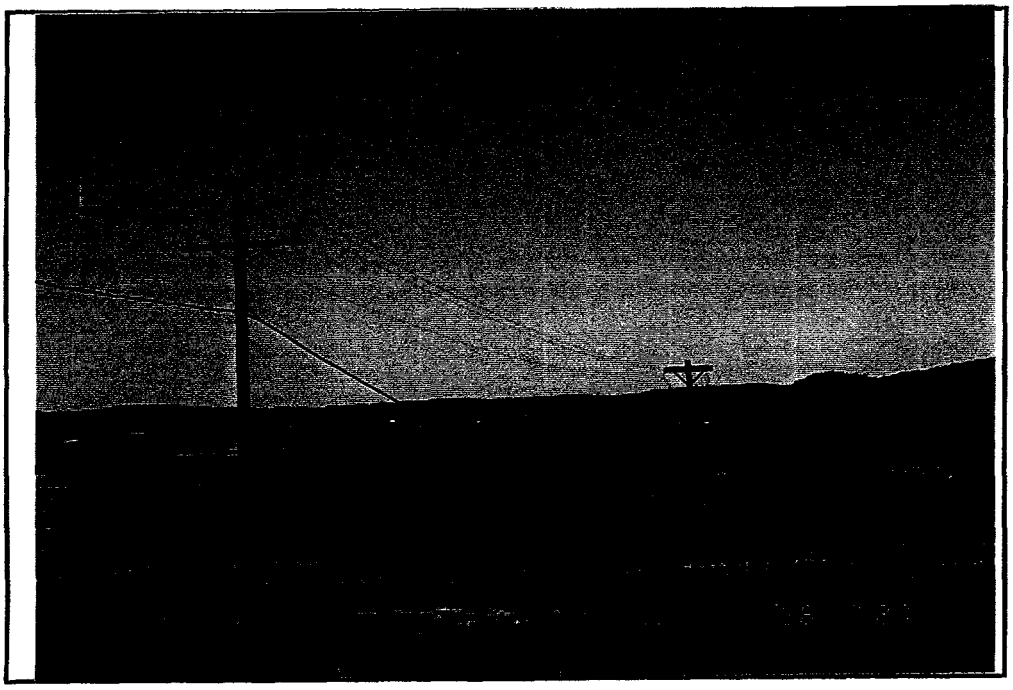


LOOKING SOUTHWEST
FROM BATTERY
B-1-35

SUBJECT PROPERTY

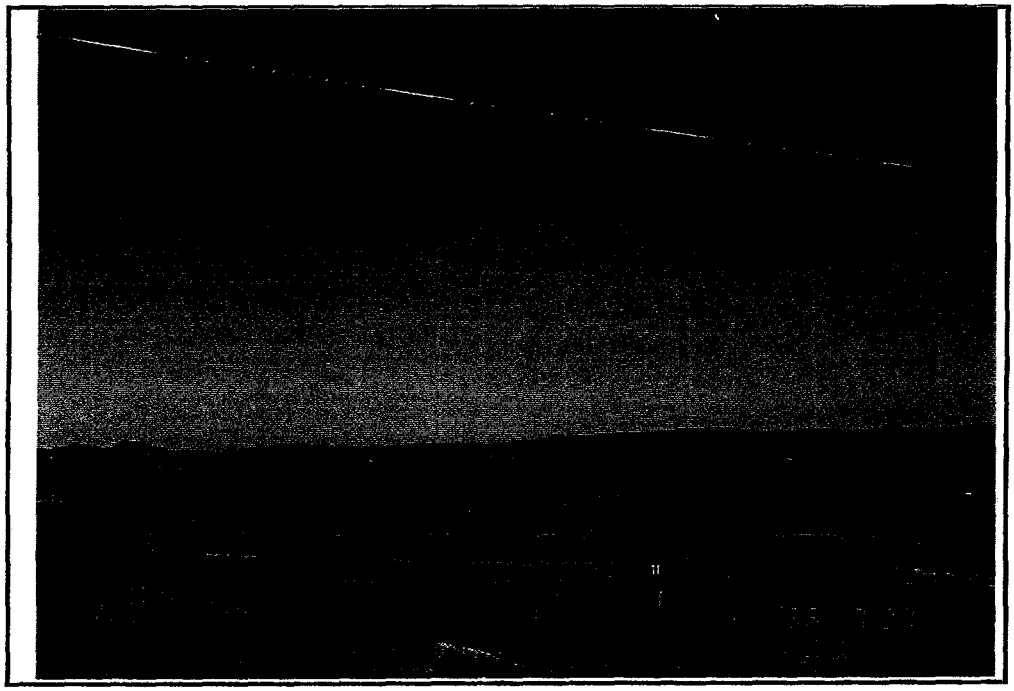


LOOKING EAST FROM
43-1-SX-34

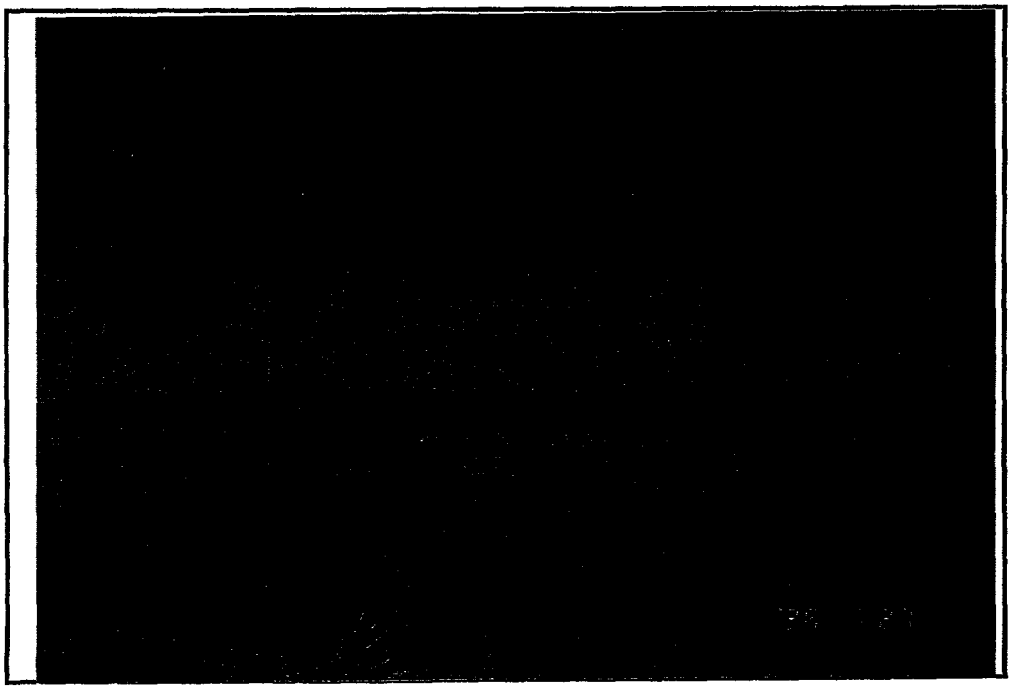


LOOKING NORTH FROM
43-1-SX-34

SUBJECT PROPERTY



LOOKING NORTH FROM WELL 46 AX 21



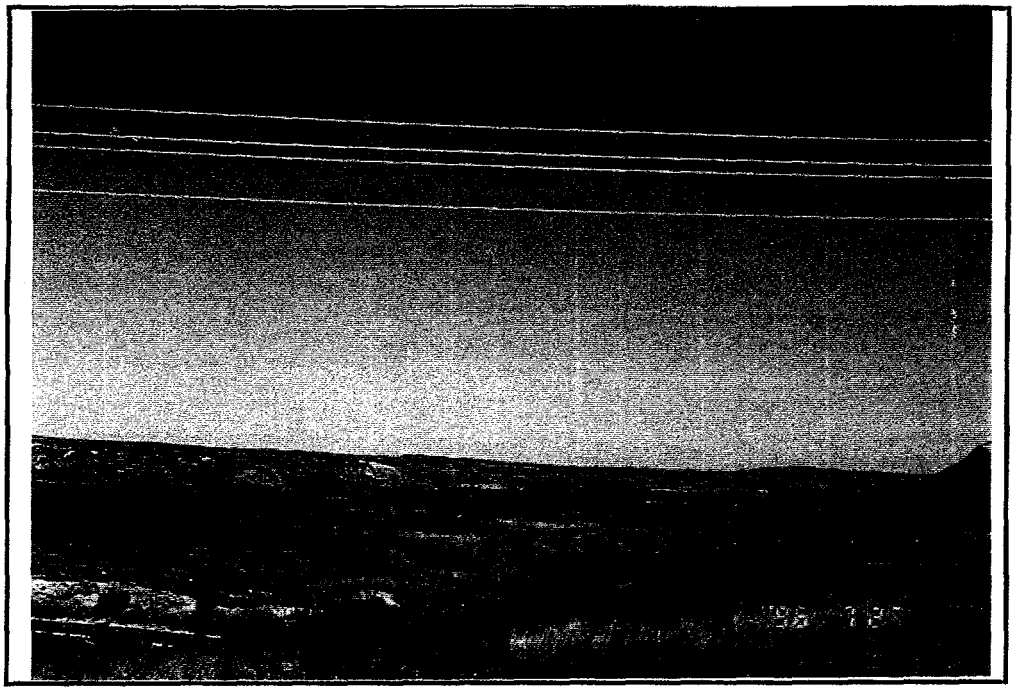
LOOKING NORTHWEST FROM WELL 46 AX 21

SUBJECT PROPERTY

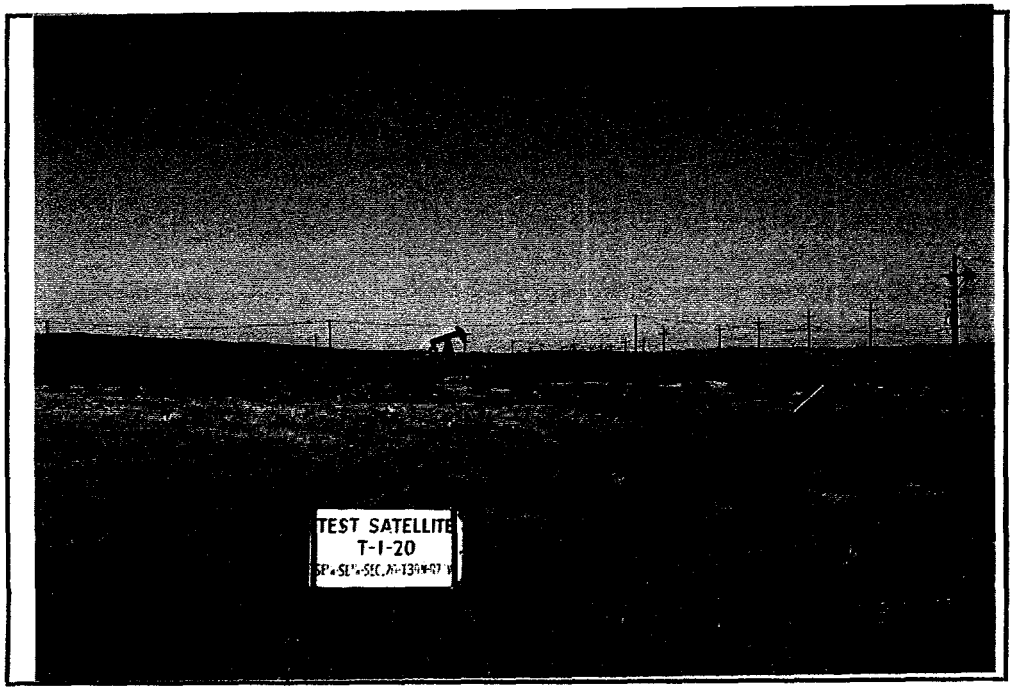
LOOKING SOUTHWEST
FROM
WELL 46 AX 21

LOOKING NORTHEAST
ALONG CREEK IN
SECTION 21

SUBJECT PROPERTY

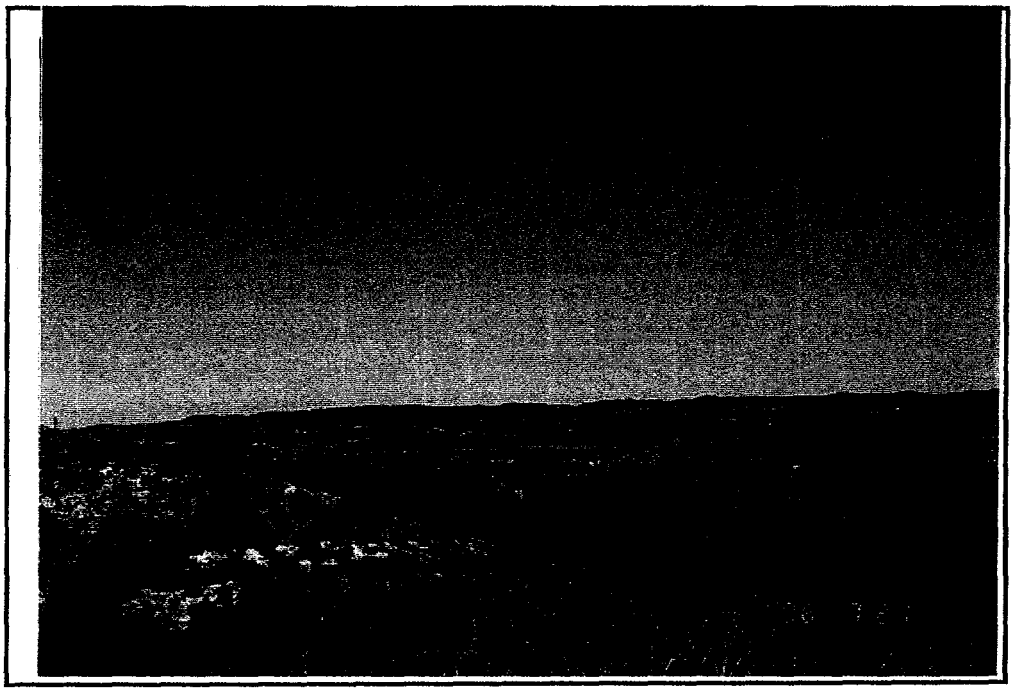


LOOKING WEST FROM
TEST SITE T-1-20

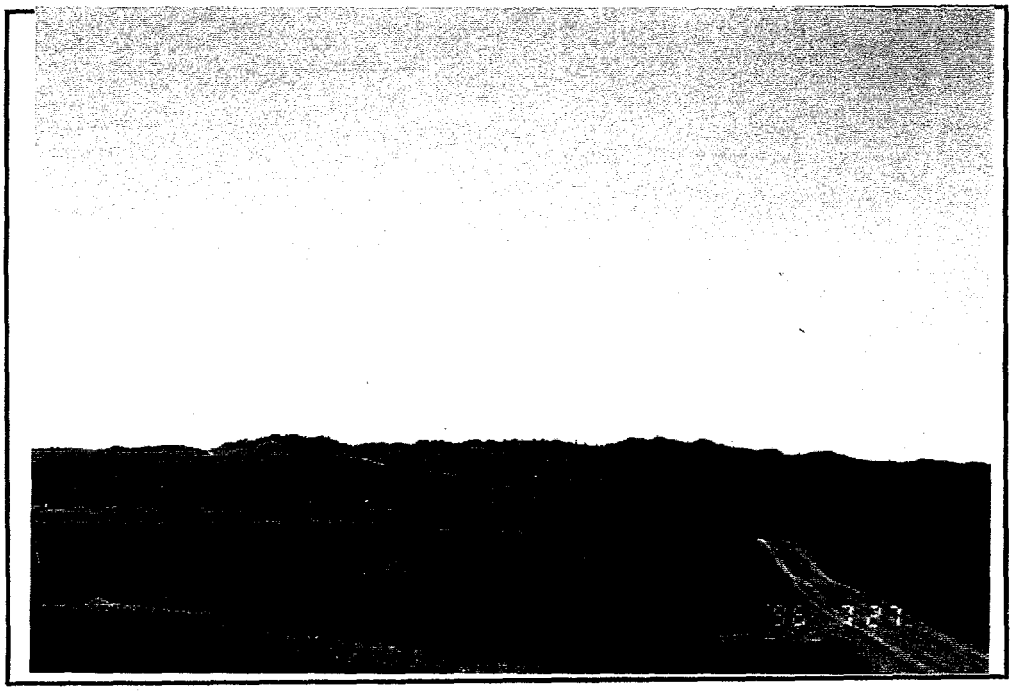


LOOKING EAST ALONG
NORTH BOUNDARY
FROM T-1-20

SUBJECT PROPERTY



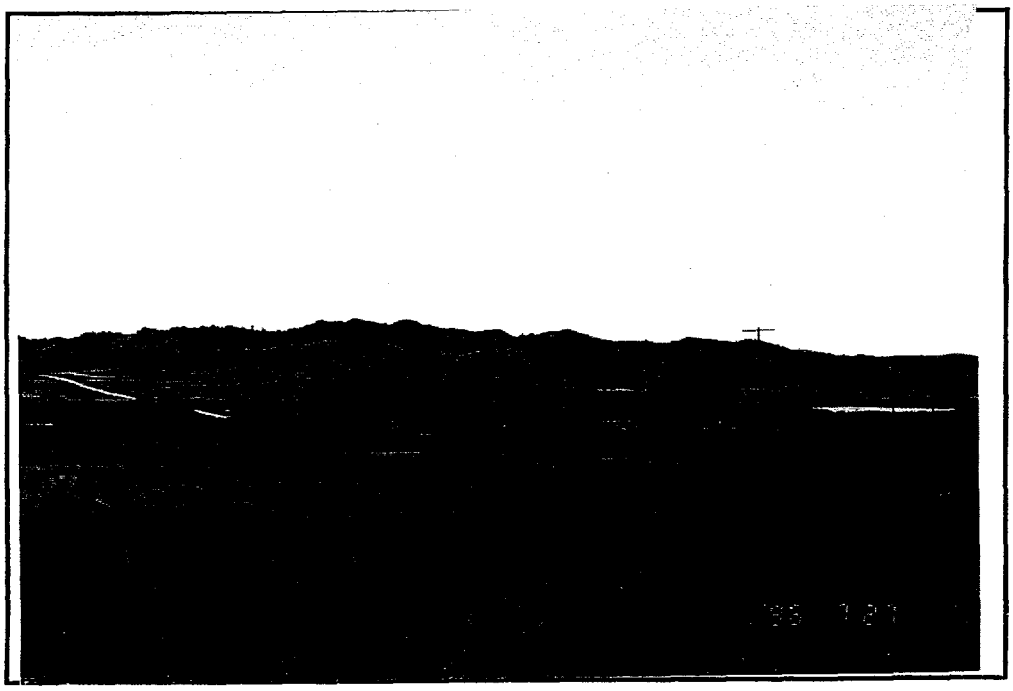
LOOKING SOUTH FROM
WELL 72 AX 20



LOOKING SOUTHEAST
FROM WELL
480 AX 20

SUBJECT PROPERTY

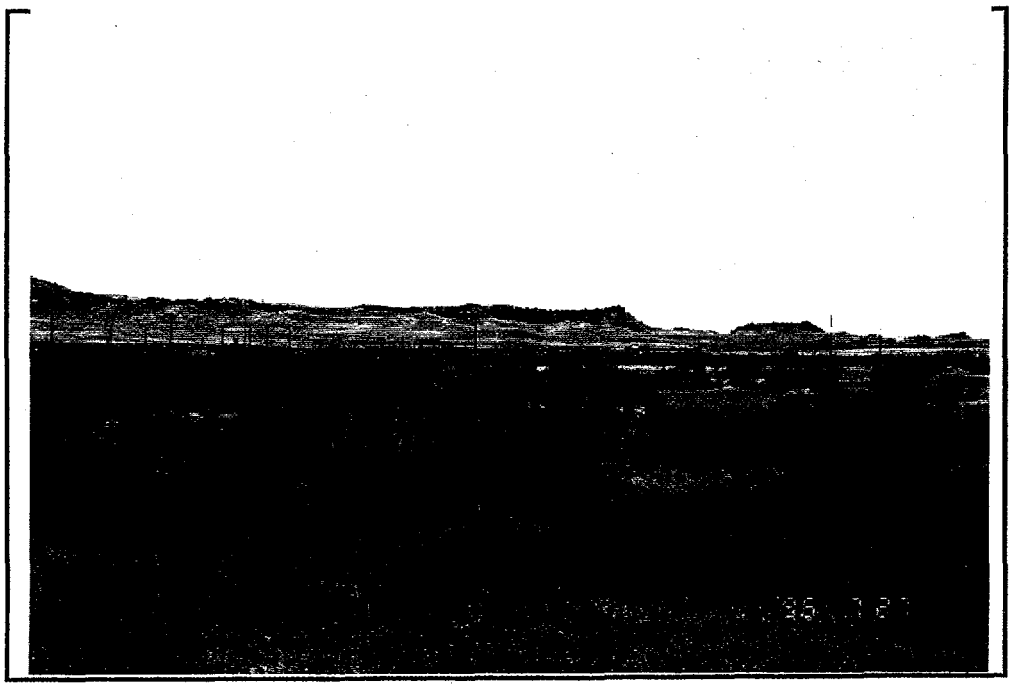
LOOKING SOUTHWEST
FROM WELL 56 TX 20



LOOKING SOUTHEAST
FROM WELL 56 TX 20

SUBJECT PROPERTY

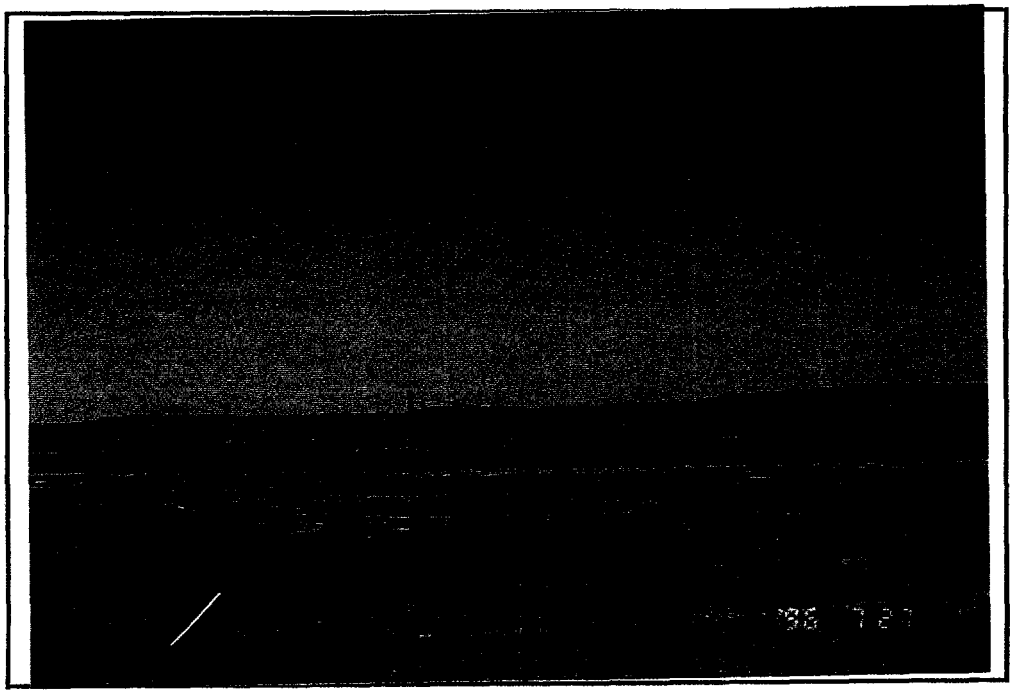
LOOKING SOUTH FROM
WELL 41 AX 29



LOOKING SOUTHEAST
FROM WELL 41 AX 29

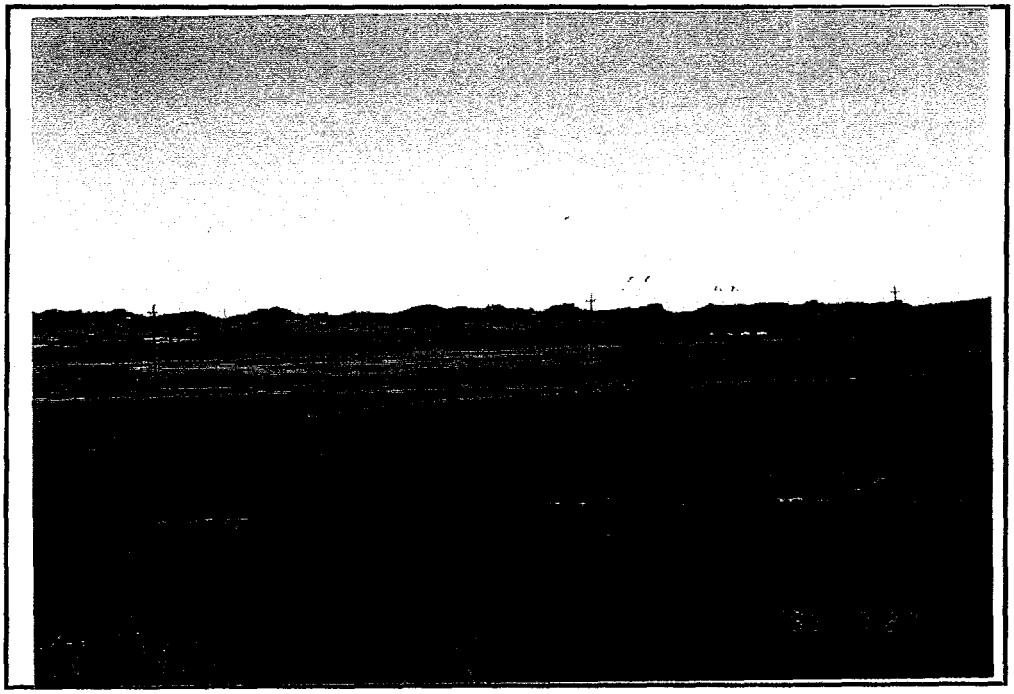
SUBJECT PROPERTY

LOOKING NORTHEAST
FROM WELL 36 AX 28

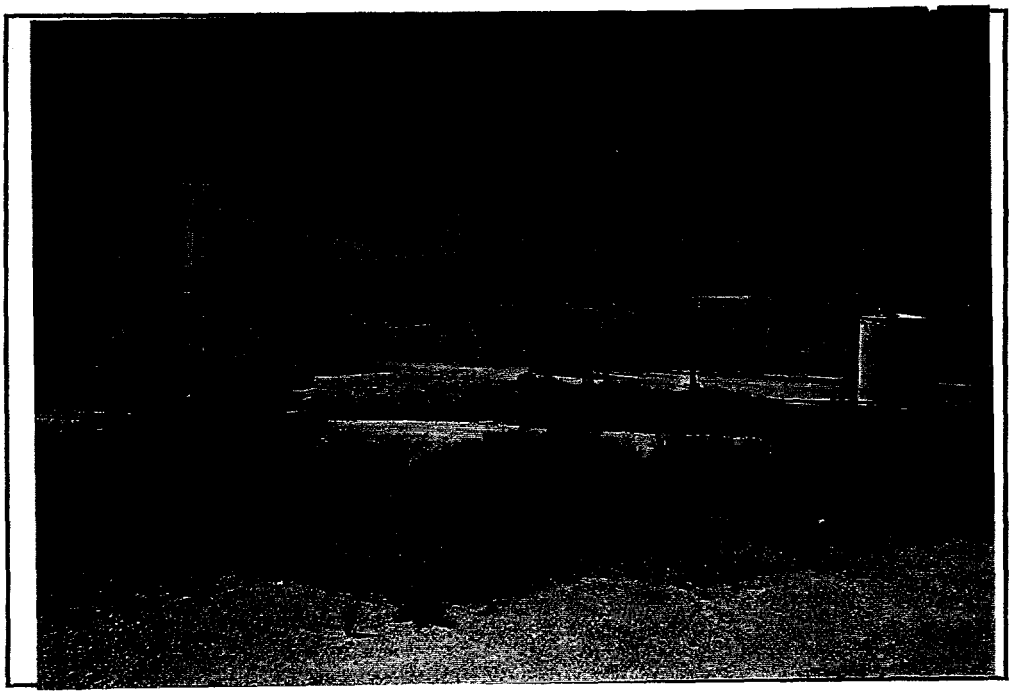


LOOKING SOUTHEAST
FROM WELL 37 AX 28

SUBJECT PROPERTY



VIEW ACROSS
SECTION 28



ADDENDUM:

PROPERTY DESCRIPTION AND FACT-FINDING REPORT FOR NAVAL PETROLEUM RESERVE NO. 3(NPR-3) NATRONA COUNTY, WYOMING

for the

U.S. DEPARTMENT OF ENERGY
Contract No. DE-AC01-96FE64202

Respectfully submitted on
August 22, 1996 by:

John B. Gustavson, President
Certified Minerals Appraiser

GUSTAVSON ASSOCIATES
5757 CENTRAL AVE. SUITE D BOULDER, COLORADO 80301 USA

APPENDIX J

ADDITIONAL FACT FINDING INFORMATION
AUGUST 22, 1996 THROUGH DECEMBER 15, 1996

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DIVESTITURE COSTS

The Department of Energy (DOE) has supplied Gustavson Associates with cost estimates associated with the sale of the NPOSR properties. These Government costs are associated with all aspects of the sale of the property to industry. These costs include severance packages for Government employees, sales expenses and all consulting and/or legal fees associated with the sale of the property to industry. Divestiture cost estimates have been provided by the Department of Energy and were only used for the sale scenario (Option 4) for each of the NPOSR properties.

We have assumed divestiture costs of $2,000,000 for NPR-3, as estimated by the Department of Energy. We have reviewed this estimate and found it to be reasonable based on current DOE staffing and operations at NPR-3.

BONUS AND RENTAL REVENUE SHARING WITH THE STATE

Under Option 2, transfer to the Department of Interior (Bureau of Land Management), royalties retained by the Federal Government were split with the appropriate State Government for a given property. However, this Appraiser has confirmed that all future bonus and rental income from the property would also be split with the State Government under the transfer option. This split of all royalty, bonus, and rental income from the property with the State Government reduces the value of the transfer option for each of the NPOSR properties.

SURFACE AND LEASING INCOME DISCOUNT RATE UNDER SALE OPTION

Surface and leasing income under the sale option has previously been discounted at 10.3 percent. This was derived based on a 10.2 percent cost of capital plus 3 percent for "pricing" risk less 2.9 percent for inflation. However, this Appraiser has reviewed this methodology and found it to be slightly inconsistent with the other discount rates under the sale option. The 2.9 percent for

inflation should not be subtracted from the total discount rate for surface and leasing income under the sale scenario. The correct discount rate as described in Appendix E to the final report would be 13.2 percent. This is derived by using the cost of capital (10.2 percent) and adding the "pricing" risk of 3 percent. Since NPR-3 is almost entirely developed with very little remaining undeveloped acreage, this change in discount rates for mineral leasing under sale has almost no effect on the value of the property to the Federal Government.

ADJUSTMENTS TO OVERHEAD COSTS

NPR-3 overhead costs have been slightly adjusted to account for years where large abandonment capital resulted in unreasonable overhead projections. The detailed breakdown of projected costs from the Fiscal Year (FY) 1996 Annual Operating Plan. February 1996. has been utilized. with adjustments based on actual year-to-date cost information through May, 1996. Actual costs for FY96 are estimated to total $6.7 million. This includes $5.15 million in direct operating costs, or $8.60 per projected barrel of oil. and $1.55 million in overhead and contractor fees. This level of expenditure. based on past trends. is expected to be some what lower in FY97. The overhead costs are allocated by adding 15 percent to operating expenses. 25 percent to capital expenses. and an additional 15 percent of that overhead for General and Administrative (G&A) costs. These percentages were adjusted to obtain a reasonable FY97 overhead cost as compared to the expected FY96 costs.

POST STEAMFLOOD OPERATING COSTS

In late FY97, the DOE plans to halt the Shannon steamflood project. Also at that time, the infill drilling in the Tensleep formation is expected to be completed. Accordingly, operational changes have been considered to estimate cost reductions associated with elimination of the steamflood and divestiture of drilling and workover equipment. Based on this Appraiser's experience, and input from DOE engineers. costs have been evaluated and projected on a $/well/month bases. Based upon the recent success from the Tensleep reservoir, its production is evaluated separately from the other reservoirs. Tensleep wells have a much higher expense per well due to high water production and related electricity costs for operation of the electrical submersible pumps. Details

of these cost projections are shown in Tables J-1, J-2, and J-3. The monthly well costs used based on this analysis are $5000/well for Tensleep wells, about $1600/well for steamflood wells and about $400/well for all others. After FY97, steamflood wells are treated as other wells. The number of wells is assumed to decline by 15 percent per year for non-Tensleep wells, and as shown on Table J-3 for Tensleep wells. All operating costs and overhead are escalated by 3.04 percent annually based upon the SPEE survey.

PLUG AND ABANDONMENT SCHEDULE UNDER INDUSTRY OWNERSHIP

The possibility was investigated that a small independent producer which might lease the existing production at NPR-3 and take over operatorship would attempt to defer all plugging and abandonment (P&A) costs as long as possible. The Wyoming Oil and Gas Conversation Commission was contacted to discuss the details of delaying the plugging of idle wells in Wyoming. They stated that it is the responsibility of the operator to submit a plan for each idle well. If there is sufficient reason not to plug a well, then the State of Wyoming will grant an extension on a case-by-case basis. Otherwise, the operator has two years to plug an idle well that has no plan for future use.

In the case of a field that is approaching its economic limit, the commission wants to see a plan from the operator that has all the wells being plugged in conjunction with the field reaching its economic limit.

Given these comments from the Wyoming Oil & Gas Conservation Commission, it is the opinion of this Appraiser that there will be no differences in the P&A schedule between the retention case and the transfer or sales case. Because NPR-3 is near its economic limit, the P&A schedule will have to exhibit a plan that ensures all wells are plugged when the economic limit is reached, regardless of who is the operator.

TABLE J-1

NPR-3 Operating Cost Analysis, FY 1996

(in thousands of dollars per year)

	Expected DOE Costs			Expected Private Operator Costs	
	As Is	Without Steamflood & Drilling Programs			
Item	With M&O Contractor	With M&O Contractor	Without Contractor	As Is	Without Steamflood
Facilities	667	600	600	667	600
Gas System	240	216	216	240	216
WO Rig	33	0	0	33	0
Water Sys	7	0	0	7	0
Water Disp	52	52	52	52	52
Cathod. Prot.	26	26	26	26	26
Pits	44	44	44	44	44
Envir Prot	129	129	129	102	102
Safety	167	167	167	100	100
Elect Main	211	211	211	211	211
Power	900	900	900	900	900
Field Main	368	368	368	368	368
Hvy Equip Mnt	227	227	227	227	0
Well Svc	390	390	390	390	390
Chemical, non-EOR	118	118	118	118	118
Chemical, EOR	79	0	0	79	0
EOR	385	0	0	385	0
Fuel Gas	1,112	0	0	1,112	0
Total Direct	**5,153**	**3,447**	**3,447**	**5,059**	**3,127**
$/Bbl	**$ 8.60**	**$ 6.09**	**$ 6.09**	**$ 8.45**	**$ 5.52**
Op OH	1,057	1,057	1,057	793	793
Cont Fee	490	355	0	0	0
Total Overhead	**1,547**	**1,412**	**1,057**	**793**	**793**
Grand Totals	**6,700**	**4,859**	**4,504**	**5,852**	**3,919**

1996 Direct Cost - Estimated Breakdown

		Total	Operating Expense		
	# wells	Production	$/well/mo	$/bbl	Total $/yr
Tensleep	9	237,250	$ 5,000	$ 2.28	$ 540,000
steamflood	68	164,615	$ 2,362	$ 11.71	$ 2,249,238
other	500	197,100	$ 394	$ 11.99	$ 2,363,927
Total/Average	**577**	**598,965**	**$ 744**	**$ 8.60**	**$ 5,153,165**

Notes:

1) Expected P & A costs are handled elsewhere.
2) Detailed costs from FY96 Annual Operating Plan adjusted to match projections based on YTD costs
3) $/Bbl based on projected FY '96 production
4) Contractor fee asumed to be 7.89 % of operating costs plus other overhead, per FY96 Annual Operating Plan

TABLE J-2

NPR-3 Sweet Production Operating Expenses

	# wells	$/well/mo	prod	$/bbl	BOPD/Well	Direct Operating Cost	
						Retention	Transfer or Sale
FY97, mo	500	557	24,372	$ 11.42	1.6	$ 278,39[illegible]	$ 272,829
FY97, yr	500	557	292,464	$ 11.42	1.6	$ 3,340,76[illegible]	$ 3,273,953
FY98, mo	425	394	15,987	$ 10.47	1.2	$ 167,44[illegible]	$ 150,700
FY98, yr	361	394	191,842	$ 8.90	1.5	$ 1,707,93[illegible]	$ 1,537,144
FY99	307	394	131,692	$ 11.02	1.2	$ 1,451,74[illegible]	$ 1,306,572
FY2000	261	394	101,552	$ 12.15	1.1	$ 1,233,98[illegible]	$ 1,110,586
FY2001	222	394	80,892	$ 12.97	1.0	$ 1,048,88[illegible]	$ 943,998
FY2002	189	394	65,877	$ 13.53	1.0	$ 891,55[illegible]	$ 802,399
FY2003	160	394	54,304	$ 13.96	0.9	$ 757,82[illegible]	$ 682,039
FY2004	136	394	45,279	$ 14.23	0.9	$ 644,14[illegible]	$ 579,733

Well count reduction per year - 15%

TABLE J-3

NPR-3 Tensleep Operating Expenses

	PDP		PDNP		PUD		Probable	
	Well Count	Operating Cost	Well Count	Operating Cost	Well Count	Operating Cost	Well Count	Operating Cost
10/96	8	$ 40,000	0	$ -	0	$ -	0	$ -
11/96	8	$ 40,000	1	$ 5,000	0	$ -	0	$ -
12/96	8	$ 40,000	1	$ 5,000	0	$ -	0	$ -
01/97	8	$ 40,000	1	$ 5,000	0	$ -	0	$ -
02/97	8	$ 40,000	1	$ 5,000	1	$ 5,000	0	$ -
03/97	8	$ 40,000	1	$ 5,000	1	$ 5,000	0	$ -
04/97	8	$ 40,000	1	$ 5,000	1	$ 5,000	0	$ -
05/97	8	$ 40,000	1	$ 5,000	2	$ 10,000	0	$ -
06/97	8	$ 40,000	1	$ 5,000	2	$ 10,000	0	$ -
07/97	8	$ 40,000	1	$ 5,000	2	$ 10,000	0	$ -
08/97	8	$ 40,000	1	$ 5,000	2	$ 10,000	1	$ 5,000
09/97	8	$ 40,000	1	$ 5,000	2	$ 10,000	1	$ 5,000
10/97	7	$ 35,000	1	$ 5,000	2	$ 10,000	1	$ 5,000
11/97	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
12/97	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
01/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
02/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
03/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
04/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
05/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
06/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
07/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
08/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
09/98	7	$ 35,000	1	$ 5,000	2	$ 10,000	2	$ 10,000
FY99	6	$360,000	1	$ 60,000	2	$120,000	2	$120,000
FY00	5	$300,000	1	$ 60,000	2	$120,000	2	$120,000
FY01	5	$300,000	1	$ 60,000	2	$120,000	2	$120,000
FY02	4	$240,000	1	$ 60,000	2	$120,000	2	$120,000
FY03	4	$240,000	1	$ 60,000	2	$120,000	2	$120,000

Notes: PUD and Probable wells drilled only under retention scenario.
All costs shown here unescalated.
FY03 well counts apply until abandonment.