The Anatomy of an Oil and Gas Drilling Contract

Owen L. Anderson

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THE ANATOMY OF AN OIL AND GAS DRILLING CONTRACT*

Owen L. Anderson†

This Article provides an analysis of contracts directly related to the drilling of domestic onshore oil and gas wells. The primary focus is on the oil and gas well drilling contract between an operator and drilling contractor. This Article briefly discusses third-party service contracts incidental to the drilling of the well.

Coverage includes a review of (1) contract negotiation, (2) the various types of drilling contracts and their contents, (3) problems that may occur in the drilling contract, and (4) the drilling process. This Article also contains a discussion of relevant cases construing drilling contracts. The author trusts that the Article will be useful to practitioners in need of a comprehensive review of drilling contract law pertaining to onshore wells.1

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1. This Article does not cover geophysical and exploration contracts, road-access or site-clearing contracts, letter agreements, farm-out agreements, joint operating agreements, pooling or unitization agreements, or service contracts subsequent to the completion of a well. Also, this Article does not discuss the unique provisions of offshore, arctic, or international drilling contracts.
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I. NEGOTIATING THE DRILLING CONTRACT

A. Business Environment

Over the past twenty years, the oil and gas drilling business has been on a boom-and-bust roller coaster ride. The sudden increase of oil prices in the 1970s and the resulting energy crisis transformed a comparatively stagnant business into one of the major international growth industries of that decade. Higher energy prices resulted in increased demand for new and more sophisticated drilling rigs for both onshore and offshore development. While this demand was softened by the Windfall Profits Tax2 and the curtailing of the oil and gas depletion allowance,3 the public's demand for energy brought unprecedented prosperity to the oil and gas drilling business. The resulting energy boom greatly increased the bargaining power of drilling contractors in negotiating drilling contracts. The shortage of drilling rigs, coupled with what seemed to be an unending increase in demand for rigs, drove drilling prices to all-time highs. Drilling contracts, traditionally operator-oriented, were modified to include more and more provisions favoring the drilling contractor. During the boom, pundits predicted an interminable, ever-increasing energy demand. However, by the early 1980s, conservation efforts and a worldwide recession slowed the growth in energy demand. These factors, together with discord among members of the OPEC cartel, resulted in a steep decline in the price of all forms of energy, especially oil and gas.

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Thus, the energy boom of the 1970s turned into the energy bust of the 1980s.

The bust left oil and gas drilling contractors with a huge inventory of rigs and drilling equipment stacked in storage yards. Drilling prices quickly tumbled, and the terms and conditions of drilling contracts became more operator-oriented than they had been prior to the energy boom. Drilling contractors, who had shifted much of the drilling risk onto the operator in the 1970s, found themselves assuming more risk than ever before. Some drilling contractors drilled wells at or below cost, just to keep their employees and equipment in service.

Throughout the 1960s and 1970s, the oil and gas drilling business, like the oil and gas industry in general, was subjected to increasing employment, safety, and environmental regulation at the local, state, and federal levels. In addition, more litigation, particularly in the field of tort law, resulted in both drilling contractors and operators being exposed to greater liability and larger jury awards than in the past. With increasing concern for groundwater safety and hazardous waste disposal, more environmental regulation of drilling seems inevitable for the 1990s.

Because of the oversupply of rigs and the increase in regulation and litigation, drilling operations have become riskier and less profitable for the drilling contractor. Although lean times in the oil patch have prompted the oil and gas industry to increase its efficiency, delays in drilling operations and unanticipated costs are still a major concern to both operators and drilling contractors. Accordingly, drilling contracts have become much more detailed in addressing the rights and liabilities of the parties, and, predictably, the party with the greater bargaining power tends to shift most of the risks and burdens onto the other party.

In discussing drilling contract law, this Article focuses on a “model” drilling contract form drafted under the sponsorship of the American Petroleum Institute, an operator-oriented organization, and three forms promulgated by the International Association of Drilling Contractors, a

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contractor-oriented organization. Notwithstanding the respective orientations of these two organizations, the forms are very similar. Experienced parties using these model forms will modify them to address specific problems encountered in prior drilling activity or to reflect relative bargaining power. Major oil companies and large independent oil companies often use their own operator-oriented forms, and large drilling contractors often use their own contractor-oriented forms.

B. Parties to the Contract

1. Identity of the Parties

After an oil and gas lease has been acquired and geophysical work has been conducted, the operator (the party who has the legal right to produce oil and gas from a given tract) may elect to drill a well. The operator may be the original lessee of the tract to be drilled, an assignee-lessee, a farmee, a designated operator under a joint operating agreement, or, occasionally, a fee mineral owner. While an operator may drill a well with its own crew and equipment, a well is most often drilled by a drilling contractor, a person or entity engaged in the business of drilling oil and gas wells.

Generally, the operator will invite several drilling contractors to bid for the job of drilling a well at a specified location and to a specified depth in accordance with detailed technical specifications outlined in the bid invitation. Using this scheme, the operator is seeking offers to drill. Some negotiation of contract terms may be necessary before the operator accepts one of the bids, thereby entering into a drilling contract. In addition, depending on the specific provisions of the drilling contract, either the operator or the drilling contractor, or both, will contract with various service companies and supply companies for special services, supplies, and equipment needed to complete the drilling project. These services may include surveying and staking the location, preparing access roads,

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5. These forms have been attached as appendices. The API form has been reproduced in two parts. Appendix A is the API model “Exhibit A Bid Sheet and Drilling Order.” Appendix B is the API model “Drilling Contract.” Both of the API model forms are reprinted with permission of the American Petroleum Institute. Appendix C is the IADC “Drilling Bid Proposal and Daywork Drilling Contract.” Appendix D is the IADC “Drilling Bid Proposal and Footage Drilling Contract.” Appendix E is the IADC “Model Turnkey Contract.” The Exhibits attached to the IADC contracts have been omitted to save space. The IADC forms are reprinted with the permission of the International Association of Drilling Contractors.
providing water for the drilling operation, setting surface casing, providing drilling mud services, providing testing services, surveying for drilling deviations, acquiring directional (whipstock) or horizontal drilling equipment, setting production casing, etc.\(^6\)

2. Negotiators

Large operators will employ a drilling manager or drilling engineer whose primary job is soliciting and negotiating drilling contracts. Large drilling contractors will also have a marketing or sales person whose primary job is responding to solicitations and negotiating final drilling-contract terms. Whether these agents have authority to execute the contract on behalf of their respective companies depends on individual company policy. The principal officers of smaller operators and drilling contractors often negotiate terms, and they usually have authority to execute the drilling contract.

Negotiators should have expertise in the technical aspects of well drilling and should be able to accurately estimate anticipated costs. The financial success of drilling contractors, and to some extent of operators,\(^7\) may depend on their respective negotiators' bargaining skill and ability to accurately and completely identify, negotiate, and clarify the many risks and technical details inherent in a drilling venture.\(^8\) Even though most drilling contracts are executed on model forms, these forms are generally modified by the parties and contain many blanks for specifically addressing detailed technical aspects of drilling that need to be fully and properly completed by knowledgeable personnel.

3. Operator's Relationship with Other Working-Interest Owners

Often the operator will be a farmee, a party to a letter agreement, or a designated operator under a joint operating agreement. In other words, other working-interest owners may have an interest in the proposed well and may be expected to pay a portion of the drilling and completion costs. Accordingly, in negotiating a drilling contract, the operator must consider any contractual or other legal obligations owed to other

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6. For a brief summary of the drilling process, see Appendix F.
7. Of course, the ultimate financial success of an operator most often depends on finding reserves of oil and gas.
8. From the drilling contractor's perspective, the negotiation of contract terms is especially critical in footage and turnkey contracts because the drilling contractor assumes greater risk and furnishes more services than under a daywork contract. The major differences in these types of contracts will be highlighted throughout this Article.
working-interest owners. The operator must be especially mindful of any contractually expressed deadlines or specifications for the commencement or completion of wells and of any limits on the maximum contributions that can be obtained from other working-interest owners. Also, the operator may be required to obtain the consent of other working-interest owners prior to executing a drilling contract. While these matters are of primary concern to the operator, the negotiator for the drilling contractor may wish to inquire as to the existence of any such obligations or limitations in order to avoid a potential problem after execution of the drilling contract; i.e., no drilling contractor would wish to assume the risk that each working-interest owner is creditworthy. A prudent drilling contractor will identify one working-interest party as the “operator” from which the contractor will take orders and receive payment. In the event both parties are concerned about the other party’s ability to perform (or pay), escrow provisions may be attached to the contract.

Even when the operator is clearly identified in the contract, a dispute can arise over the party ultimately liable for payment of the contract price. In *Carter Baron Drilling v. Badger Oil Corp.*, Badger was clearly identified as the “operator” in an IADC daywork form, and the contract specified that “‘operator shall pay contractor.’” Badger had been retained by Knee Hill Energy, Inc., the working-interest owner, to operate the well on its behalf. When Knee Hill failed to pay for the drilling expenses, Badger resigned as operator. Ultimately, Carter Baron sued Badger for payment. Badger argued that it was acting merely as an agent for Knee Hill. Based upon conflicting testimony on custom and usage in the drilling trade and the conduct of Carter Baron in attempting to collect from Knee Hill, the trial judge refused Carter Baron’s motion for summary judgment, thereby giving Badger the opportunity to prove that it was under no obligation to pay Carter Baron without first being paid by Knee Hill. The facts indicated that Carter Baron initially attempted to collect from Knee Hill before suing Badger. Had Carter Baron sought payment from Badger only, the custom and usage evidence alone

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11. *Id.* at 593.
12. *Id.* at 599-600.
13. *Id.* at 594.
might not have been sufficient to vary the terms of an unambiguous contract, and Carter Baron's motion for summary judgment might have been granted.

C. Formal Requirements Concerning Execution

A pure drilling contract which calls for the drilling of a well in return for a money payment does not relate to an interest in real property; consequently, such a contract would be outside the real property statute of frauds. However, if a well is to be drilled in return for an interest in real property (such as a farm-out agreement), then the parties must comply with the real property statute of frauds in the absence of an applicable exception.

Since most wells are completed within one year, a drilling contract is generally not within the statute of frauds governing contracts which will not be performed within a year. However, since drilling a well is a costly and risky venture, the parties to a drilling contract should have a written contract signed by both parties. Moreover, because of the detailed nature of drilling contracts, a written contract is essential as a practical matter.

In negotiating a drilling contract, the parties are free to specify that all terms of the contract must be in writing and that both parties must execute the contract in order to bind the parties. In fact, under the model forms, the operator solicits offers from drilling contractors by having them complete and execute the contract and exhibits. The operator then has the option of accepting the offer by executing the contract. This


15. See generally Cohen v. McCutchin, 565 S.W.2d 230 (Tex. 1978) (a case involving letter agreements between working-interest owners), wherein the correspondence and other memoranda were insufficient to identify the assignor of certain working interests to parties who had allegedly agreed to pay for certain drilling costs. But even where an interest in real property is concerned, the usual exceptions to the statute of frauds will apply. For example, in Lincoln v. Kirk, 243 S.W. 671, 674 (Tex. Civ. App.—Fort Worth 1922, writ dism'd), the court upheld an oral contract in which the contractor was given possession of the property and improved it by drilling a well. This case also held that a contract providing for a share of the net proceeds of production is not within the statute of frauds. Id. However, this result is unlikely in a jurisdiction which regards the conferring of a net proceeds interest as a conveyance of an interest in real estate.

16. Lincoln, 243 S.W. at 674.

17. For example, prudent operators and drilling contractors are careful to allocate risk of loss. See infra subsections III(K) and (L). Without a written contract, dispute over the intended terms is inevitable should a mishap occur. See, e.g., Halliburton Oil Well Cementing Co. v. Millican, 171 F.2d 426 (5th Cir. 1948).
standard practice can have interesting and perhaps unexpected consequences. For example, in Brashar v. Mobil Oil Corp.,\(^\text{18}\) the court noted that this practice makes the operator's signature a condition precedent to being bound.\(^\text{19}\) The court then held that Texas law governed the transaction because the operator signed the contract in Texas, even though the drilling contractor's place of business was New Mexico and the wells were to be drilled in Colorado.\(^\text{20}\)

When negotiating and preparing a detailed drilling contract, one or more addenda are usually added to the contract. Where the addenda are not fully incorporated by reference into the executed contract form, the party who sought the addenda may not be able to prove that both parties agreed to their incorporation. For example, in C.E. Jacobs Co. v. Lamar H. Moore Drilling Co.,\(^\text{21}\) the drilling contractor contended that a special addendum allocating risk in the event of loss of circulation or well control shifted the risk of loss of the well and in-hole equipment onto the operator.\(^\text{22}\) However, because the executed contract made no reference to the addendum, the court ruled that the addendum was not a part of the contract,\(^\text{23}\) even though the addendum had been included in the package of documentation that the drilling contractor had sent the operator for execution, and even though the operator had returned the addendum to the contractor along with the executed contract.\(^\text{24}\) Consequently, the drilling contractor lost in-hole equipment and received no compensation (in contract or quantum meruit) for work performed because the well had not been drilled to the footage contract depth.\(^\text{25}\) Had the contract clearly incorporated the addendum by reference, the result would have been different.

Once the contract has been fully and properly prepared, agents having authority to execute a contract on behalf of the operator and drilling contractor should execute the contract and the accompanying exhibits.\(^\text{26}\)
If there is any doubt about the authority of the executing agent of a corporation, a certified copy of a resolution of the corporate board of directors conferring such authority should be secured from the corporate secretary. Drilling contractors should be especially careful when dealing with an individual who is acting as an apparent partner that the partnership, and not the individual, is the operator. 27

As with any written contract, the parties to a drilling contract must beware of representations or other conduct which could result in an oral modification of the contract's terms. While the statute of frauds technically requires (and prudent practice dictates) that a written contract be amended in writing, courts will search for a means to uphold oral modifications. For example, in Greene v. Kinley, 28 the drilling contractor had agreed in writing to drill on a footage basis "to a depth of 1,920 feet unless oil was found at a lesser depth." 29 Oil was found at 1,845 feet, but the operator wished to go deeper. The parties orally agreed that further drilling would continue on a daywork basis. 30 In upholding the oral agreement, the court concluded that the written agreement had been completed and that the parties had entered into a new and separate oral agreement. 31

In E.B. Duncan Drilling & Well Servicing Co. v. Robinson Research, Inc., 32 the footage contract specified drilling to a maximum depth of 3,000 feet to test the Paluxy formation. 33 When well control problems occurred at a depth of 1,068 feet, the operator ordered the well completed at that depth, and the contractor obliged. 34 Although the court determined that the loss of well control was due to the negligence of the contractor, 35 the court concluded that the operator could not recover for breach of contract because of the parties’ agreement to complete the well at the shallower depth. 36 However, the court also ruled that because the contractor had agreed to complete the well at a shallower depth, the contractor could collect footage rates for the depth drilled only and not for

27. See, e.g., Blackstock v. Culbertson, 127 F. Supp. 828, 831-32 (D. Minn. 1955), where the court refused to find the partnership liable under a drilling contract even though both partners had actively participated in supervising the drilling operations.
29. Id. at 266, 116 P.2d at 887.
30. Id.
31. Id. at 267, 116 P.2d at 888.
32. 147 So. 2d 95 (La. Ct. App. 1962).
33. Id. at 96.
34. Id. at 99.
35. Id. See also infra subsection III(I) for a discussion of this portion of the case.
36. E.B. Duncan, 147 So. 2d at 99.
the specified contract minimum or maximum depth.  

In *Lemm v. Sparks*, the drilling contractor agreed to drill two wells to a specified depth, each for a fixed price. The drilling contractor contended that the parties had orally agreed that completion expenses were to be provided at an additional cost and that the operators had already paid the drilling contractor more than required by the terms of the written contract. The court upheld the oral agreement as an additional and separate contract from the written drilling contract.

But in *Grayhill Drilling Co. v. Superior Oil Co.*, the parties had entered into a written footage contract calling for stated price per foot of hole drilled to the Gibson sand, which was estimated to be at a depth of approximately 6,500 feet. When the well reached approximately 4,000 feet, a steep dip in the geological formation was encountered which made continued vertical drilling more difficult and expensive. The parties then orally agreed that drilling should continue on a cost-plus basis, thereby shifting much of the risk from the drilling contractor to the operator. When the well reached a depth of 7,254 feet, it was abandoned as a dry hole. The parties then disagreed as to the compensation due the drilling contractor. The operator ultimately sent a check to the drilling contractor “in full and final settlement.” The drilling contractor cashed the check and then brought suit for further compensation. The court held for the operator on the basis that the full-payment check constituted an accord and satisfaction. In reaching this decision, however, the court expressed doubt that the oral modification in this particular case would have been enforceable by the drilling contractor since the contractor had essentially threatened to breach the contract if modifications respecting completion costs were not made. Thus, *Grayhill* provides several fundamental, but important, lessons: (1) The parties to a drilling contract should cover all aspects of a drilling contract, including any modifications, in writing; (2) In seeking to modify a contract, a party must be careful not to threaten to breach the contract if the modifications are not

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37. *Id.* at 99-100.  
39. *Id.* at 108 n.2, 321 S.W.2d at 390-91 n.2.  
40. *Id.* at 110, 321 S.W.2d at 391.  
41. *Id.* at 110, 321 S.W.2d at 392.  
42. 39 Cal. 2d 751, 249 P.2d 21 (1952).  
43. *Id.* at 751, 249 P.2d at 21.  
44. *Id.* at 752, 249 P.2d at 22.  
45. *Id.* at 753, 249 P.2d at 22.  
46. *Id.* at 754, 249 P.2d at 23.  
47. *Id.*
accepted; (3) In at least some jurisdictions, the parties must be wary of accepting partial settlements that could be construed as an accord and satisfaction.

II. PREPARATION OF DRILLING CONTRACTS

A. Drilling Contracts and Geographic Location

1. Onshore Drilling Contracts

With the exception of subsections II(A)(2), (3), and (4), this Article discusses drilling contracts for the drilling of domestic onshore oil and gas wells. There are three types of domestic contracts in common use: daywork, footage, and turnkey. All types are usually executed on preprinted forms. However, the turnkey contract often may be tailor-made to a particular drilling program.

2. Offshore Drilling Contracts

An offshore drilling contract refers to any drilling contract for the drilling of an offshore well. Offshore contracts are generally of the daywork type and many provisions in offshore contracts are similar to those found in onshore daywork contracts. However, offshore contracts contain more detailed provisions on liability for safety and environmental hazards and address the special problems of transporting the rig, equipment, and personnel to and from the well site. In addition, since some of the drilling and related operations are governed by federal admiralty law, an offshore contract contains specific provisions that outline the parties’ respective rights and obligations under admiralty law.

3. Arctic Drilling Contracts

An arctic drilling contract refers to any drilling contract concerning the drilling of a well in arctic regions, whether offshore or onshore. These contracts are generally of the daywork type, but they are very detailed and tailor-made for specific drilling programs. Special provisions may address transportation to and from the well site, the boarding

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48. See infra subsection II(C).
49. See infra subsection II(C)(3).
50. See infra subsection II(C)(1).
52. See infra subsection II(C)(1).
and care of employees, weather problems, employment and accommodation of native populations, and other safety and environmental problems unique to arctic operations.\textsuperscript{53}

4. International Drilling Contracts

An international drilling contract is any drilling contract concerning the drilling of either an onshore or an offshore well within the jurisdiction of a foreign government. International contracts are generally of the daywork type\textsuperscript{54} and contain provisions addressing the special risks of drilling on foreign soil. Some of these risks include the risk that the foreign government will expropriate the well, rig, or other equipment, will expel the operator or drilling contractor from the country, will become involved in a war, or will suffer a revolution. A well-drafted contract specifies which country’s laws are to govern the terms of the contract, the currency to be used for payment, and how variations in the value of the selected currency are to be handled. If the laws of the United States are to govern the terms of the contract, the law of a specific state is also specified. In addition, such contracts contain provisions tailor-made for the particular foreign jurisdiction. Such provisions may address employment, safety, and conservation regulations, as well as taxes.\textsuperscript{55}

B. Model and Company Drilling Contract Forms

1. The American Petroleum Institute Model Form

The American Petroleum Institute (API) has promulgated the most commonly used model form.\textsuperscript{56} This form contains a disclaimer stating that it is only a suggested guide and may not contain all of the provisions necessary in particular situations. Nonetheless, the API form is often used without modification and submitted for execution with the only additions being the filling in of blanks left on the form. This form may be used for both single and multiple well arrangements and may be completed as either a daywork\textsuperscript{57} or a footage\textsuperscript{58} contract.

\begin{itemize}
\item \textsuperscript{53} See generally Calkins, \textit{The Oil Well Drilling Contract}, supra note 51.
\item \textsuperscript{54} See infra subsection II(C)(1).
\item \textsuperscript{55} See generally Calkins, \textit{The Oil Well Drilling Contract}, supra note 51.
\item \textsuperscript{56} The API Model Form may be obtained from the American Petroleum Institute, 211 North Ervay, Suite 1700, Dallas, Texas 75201.
\item \textsuperscript{57} See infra subsection II(C)(1).
\item \textsuperscript{58} See infra subsection II(C)(2).
\end{itemize}
2. The International Association of Drilling Contractors Forms

The International Association of Drilling Contractors (IADC) has promulgated daywork,\textsuperscript{59} footage,\textsuperscript{60} turnkey,\textsuperscript{61} offshore,\textsuperscript{62} and international\textsuperscript{63} model forms.\textsuperscript{64} The domestic onshore daywork and footage contract forms are substantially similar to the API model form. The IADC forms, however, are slightly more detailed. Like the API form, the IADC forms contain disclaimers that the forms are only suggested guides and may not contain all of the provisions necessary in particular situations. The IADC forms are also easier to understand than the API form because there are separate forms for footage and daywork contracts; however, the API form is more commonly used.

3. Major Company Forms

Most major oil companies and large independent companies have their own operator-oriented contract forms. While company forms may include provisions substantially similar to provisions found in the model forms, they typically contain key provisions that significantly depart from related provisions found in the model forms.\textsuperscript{65} Some of these variations arise because major companies have historically had superior bargaining power over drilling contractors. However, other variations arise in response to particular problems encountered by the company in the drilling of a previous well. A few large drilling-contractor companies have their own standard contract forms that are more contractor-oriented than the model forms. The respective bargaining powers of the operator and drilling contractor at the time of contract negotiations will influence the choice of a particular form and any modifications.

4. Special Forms

Although the International Association of Drilling Contractors has promulgated model international onshore,\textsuperscript{66} domestic and international

\textsuperscript{59} See infra subsection II(C)(1).
\textsuperscript{60} See infra subsection II(C)(2).
\textsuperscript{61} See infra subsection II(C)(3).
\textsuperscript{62} See supra subsection II(A)(2).
\textsuperscript{63} See supra subsection II(A)(4).
\textsuperscript{64} IADC forms may be obtained from the International Association of Drilling Contractors, P.O. Box 37414, Houston, Texas 77036.
\textsuperscript{65} In preparing this Article, the author examined some company forms that followed either the API or IADC format, but contained provisions that were significantly different from the officially sponsored forms. Oil and gas practitioners will recall the parallel practice of oil companies who devised their own oil and gas lease forms but identified them as “Producer’s 88, revised.”
\textsuperscript{66} See supra subsection II(A)(4).
offshore, these contracts are usually tailor-made to fit particular drilling programs. Arctic contracts are always tailor-made and very detailed.

C. Types of Drilling Contracts

Three major types of drilling contracts govern the drilling of domestic onshore wells: footage, daywork, and turnkey. Of these, the daywork contract historically has been the most commonly used form, although in certain areas or at certain times the footage or turnkey contract may be more prevalent. With respect to offshore, international, and arctic contracts, the daywork contract is clearly the most common, although one may occasionally encounter a footage or turnkey contract for such wells. For example, some offshore wells in the Gulf of Mexico have been drilled under turnkey contracts.

1. Daywork Contracts

A "day-rate" or "daywork" contract provides that the drilling contractor be paid a stipulated price (rate) for work performed at the direction of the operator over a twenty-four-hour period with the contractor assuming only specified risks. The amount of the stipulated daywork rate depends on a number of factors, including the type of rig, the size of the crew, and the party responsible for furnishing the crew, drill pipe, other equipment, and special well services. The daywork rate may change at various stages of contract performance. In addition, a daywork contract may provide for lump-sum payments for specialized work, such as mobilization and demobilization.

67. See supra subsection II(A)(2).
68. See infra subsection II(C)(3).
69. See supra subsection II(A)(3).
70. Occasionally, one may encounter a drilling contract that is a bit difficult to classify. One such contract was at issue in Boger & Boger v. Continental Fire & Casualty Ins. Corp., 234 S.W.2d 133 (Tex. Civ. App.—Dallas 1950, writ ref’d n.r.e.). The contract provided that the contractor would drill the well in return for an interest in the oil and gas lease. The contractor was to furnish the rig and all equipment and do the drilling; however, the operator was to reimburse the contractor for "all out-of-pocket expense." Id. at 134 (quoting brief of appellant). The court correctly held that worker’s compensation premiums for coverage of the crew was an out-of-pocket expense. Id. at 135. While the court did not classify the contract, it might best be described as a cost-plus turnkey contract.
Proportionate sums may be paid for fractions of days, and proportionate reductions in the daywork rate may be made when the rig is on "standby time" (i.e., the time when the rig is on location but, for a variety of reasons, is not "making hole"). When the rig is on "standby time," the contractor's employees are still on location and their salaries, along with other expenses of the contractor, are continuing. However, some of the contractor's operating expenses, such as use of drill pipe and fuel for operating the rig, are not being incurred. Accordingly, the "standby rate" is generally lower than the daywork rate.

Historically, the daywork contract has been regarded as more favorable to the drilling contractor than the footage or turnkey contract since the driller assumes less risk and is paid for each day of operation as directed by the operator. In the 1980s, however, some drilling contractors found footage and turnkey contracts to be more profitable, even though they are riskier. Thus, the terms of a contract are really a function of market conditions.

Under the daywork contract, the driller is responsible for specified risks, while the general risk of delay and the risk of liabilities not assumed by the contractor are on the operator. Modern forms, however, tend to separate the risks into categories, and some operator-oriented company forms attempt to shift much of the risk to the drilling contractor. Under the traditional daywork contract, the operator is in charge of directing the drilling operation. In other words, a daywork contract is similar to the contractor's lease of a rig, related equipment, and crew to the operator. The contractor, however, is still obliged to provide trained personnel and equipment capable of performing the contract. Modern forms tend to alter this traditional contractor/operator relationship by providing that the drilling contractor is in charge of day-to-day operations and functions as an independent contractor. Some operator-oriented forms provide that, while the operator must approve the contract work, the operator "is only interested in results obtained."

The effort by operators to shift more responsibilities to the drilling contractor under the daywork contract has resulted in model form provisions which strike a cautious compromise. For example, the IADC

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72. Note, however, that daywork contracts may provide that the operator furnish drill pipe and fuel.
73. In times of high demand for rigs, particularly those of a specialized nature (such as a rig capable of drilling both to deep formations and in high pressures), all daywork rates may be the same, whether the rig is drilling or idle.
74. See Appendix B, Article 3.2; Appendix C, Preamble.
75. See, e.g., Appendix B, Article 14.
76. Major company contract dated March 2, 1988 (identity is confidential at party's request).
daywork form states that the "Operator engages Contractor as an Independent Contractor . . . on a daywork basis." 77 But immediately thereafter, the form defines "daywork basis" to mean that the "Contractor shall furnish equipment, labor, and perform services as herein provided, for a specified sum per day under the direction, supervision and control of Operator," that the "Contractor . . . assumes only the obligations and liabilities stated herein," and that otherwise "Operator shall be solely responsible and assumes liability for all consequences of operations by both parties . . . including results and all other risks or liabilities incurred in or incident to such operations." 78

The API daywork contracts contain similar provisions, 79 but go to greater length in defining the contractor's role as that of an "independent contractor." 80 This language should clarify the drilling contractor's status as an independent contractor in the event of a dispute over compensation due the contractor's employees or subcontractors. However, with regard to other risks and obligations, particularly those arising in tort, the courts must look to more specific language found elsewhere in these contracts. 81

While footage and turnkey contracts are perhaps older forms of drilling contracts, daywork contracts are the most common and will generally be used whenever the demand for drilling is high in relation to the supply and availability of rigs. In times of peak demand for rigs, especially for rigs designed for a particular task, such as the drilling of a deep well, the drilling contractor may insist on a "term daywork" contract. Under this type of contract, the contractor is entitled to receive a fixed daywork rate of compensation over the term of the contract whether the rig is drilling, on standby, or rigged down and standing idle. 82

2. Footage Contracts

A "footage" contract provides that the drilling contractor be paid a stipulated price per foot of hole drilled from the surface through the total

77. Appendix C, Preamble (emphasis added).
78. Appendix C, Preamble (emphasis added).
79. See Appendix B, Article 3.2.
80. See Appendix B, Article 14.
81. See infra subsection III(L).
82. For a case concerning a dispute over the proper construction of a term daywork contract, see Wagner & Brown v. E.W. Moran Drilling Co., 702 S.W.2d 760 (Tex. App.—Fort Worth 1986, no writ) and discussion of this case in subsection III(C)(3), infra.
depth or for some other specified objective. The IADC footage contract specifies that the operator is an independent contractor, and that the "Contractor shall direct, supervise and control drilling operations and assumes certain liabilities to the extent specifically provided for herein." Accordingly, at the outset the contractor more clearly assumes the general risk associated with drilling under a footage contract rather than under a daywork contract.

A footage contract also contains provisions calling for daywork compensation. For example, under a typical "standby" or "shutdown time" provision, daywork compensation is due when specified circumstances result in the cessation of drilling operations or when they necessitate special drilling operations. When drilling under a footage contract, the specific circumstances requiring daywork payments vary, but would commonly include drilling below the specified contract depth, waiting for cementing operations or well testing, waiting for orders from the operator, or suspending operations on order of the operator. Daywork rates also typically apply whenever impenetrable formations or abnormal pressures are encountered, whenever well circulation is lost, or whenever other problems result in delays beyond the control of the drilling contractor.

When a footage contract calls for daywork rates, the risks associated with drilling are also allocated as if the contract were a daywork contract. In other words, when drilling under the daywork provisions of a footage contract, the operator assumes the general risks of drilling, and the contractor is liable only for the risks that would be specifically assumed while drilling under a daywork contract. Accordingly, a well-drafted footage contract will specifically define the circumstances under which daywork rates apply. Poor drafting or later conduct inconsistent with the contract terms can lead to disputes over which rates apply or over which party had the risk of loss when a particular mishap occurred.

Because the drilling contractor is paid only for footage drilled and for specified daywork, and because the contractor assumes more risk, the footage contract has been regarded as more advantageous to the operator

83. See, e.g., Appendix B, Article 3.3. See generally Calkins, The Oil Well Drilling Contract, supra note 51, at 3-2; Calkins, The Drilling Contract, supra note 71, at 288; and H. Williams & C. Meyers, supra note 71, at 368-69.
84. See Appendix D, Preamble and Article 19.1.
85. Appendix D, Preamble.
86. For a discussion of daywork compensation, see supra subsection II(C)(1).
87. See, e.g., Appendix B, Article 3.3 (a)-(d).
88. See, e.g., Appendix B, Article 3.2; Appendix D, Preamble.
than the daywork contract. Use of the footage contract increases in a slow oil-patch economy. When demand for rigs is high, or when the risks associated with drilling are particularly great, the daywork contract is more commonly used. However, as previously mentioned, the contract used is really a function of market conditions, and the drilling contractor may find a footage contract more profitable.

3. Turnkey Contracts

A "turnkey" contract provides for the drilling contractor to be paid a stipulated price for drilling a well to a specified depth or a targeted formation. Under a "pure" turnkey contract, in the event a commercial quantity of oil or gas is discovered, the contractor completes the well so that the operator may simply "turn the key" to commence production. In practice, however, the drilling contractor does not guarantee production, and, under most modern turnkey contracts, the operator is responsible for the cost and obligation of completing and equipping the well. One reason for this is that once a well has reached total depth, many of the operations involved in completing and equipping a well can be accomplished with less powerful and less expensive equipment than the rig used in drilling to the target formation.

In general, a drilling contractor assumes more risk under the turnkey contract than under the other types of contracts because the contractor has general control of all drilling operations. Turnkey contracts, however, are often tailor-made to particular drilling conditions which may be encountered. Thus, a turnkey contract generally places specified risks on the operator and provides for additional compensation to the

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89. The American Petroleum Institute does not have a model turnkey form. The International Association of Drilling Contractors promulgated a model turnkey contract in February 1988. A copy of this form is reproduced as Appendix E.

90. Under the usual turnkey contract, however, the drilling contractor is entitled to payment even if the well is completed as a dry hole. See Totah Drilling Co. v. Abraham, 64 N.M. 380, 328 P.2d 1083 (1958), wherein the court defined a turnkey contract as follows:

[A] turn-key job means the testing of the formation contemplated by the parties and completion of a producing well or abandonment as a dry hole all done for a specific agreed-upon total consideration thereby putting the risk of rising costs, costs of well trouble, delays caused by the weather, etc., upon the contracting driller. In the absence of a clear expression in the contract the driller should not be held to guarantee a producing well.

64 N.M. at 393, 328 P.2d at 1091. See also Tilley v. Allied Materials Corp., 208 Okla. 433, 256 P.2d 1110 (1953). As to the definition of a "turnkey contract" within the oil and gas industry, see Continental Oil Co. v. Jones, 177 F.2d 508, 510 (10th Cir. 1949), cert. denied, 339 U.S. 931 (1950).

drilling contractor (usually at a daywork rate) for certain operations.\textsuperscript{92} Such operations may include drilling below the specified turnkey depth, additional operations necessitated by the operator’s negligence or by failure of equipment or materials furnished by the operator, or any additional operations performed at the operator’s request that were not specified in the contract. The operator may assume the risk of loss attributable to the operator’s negligence, the risk of loss of the operator’s equipment, the risk of loss to contractor’s equipment at times when operations are conducted on a daywork basis, and the risk of damage to the oil and gas property.

In \textit{Par-Co Drilling, Inc. v. Franks Petroleum Inc.},\textsuperscript{93} the turnkey contract specified that the contractor was to drill a well to a depth of 7,900 feet. After the well was logged and cored, the operator would have twenty-four hours of free rig time to decide whether to complete or plug the well.\textsuperscript{94} The well was drilled to a depth of 7,916 feet and was then logged and cored. The operator elected to complete the well, so the contractor re-entered the hole to condition it for the setting of production casing.\textsuperscript{95} During this operation, the drill pipe became stuck.\textsuperscript{96} The contractor sought daywork payments for the time spent retrieving the drill pipe and for completion operations. The operator argued that the turnkey contract required the contractor to complete the well at its own expense, except for the cost of production casing.\textsuperscript{97} Based primarily on testimony concerning custom and practice in the industry, the court held that, after the well was logged and cored, the operator assumed all risk and was obligated to pay daywork rates after the twenty-four hours of free rig time had elapsed.\textsuperscript{98} This case illustrates that the risk of loss may shift to the operator before the obligation to pay daywork rates arises.

Usually the type of contract made is clear on the face of the contract; for example, the model form contracts are titled “footage,” “daywork,” or “turnkey.” Occasionally, however, the type of drilling contract may be at issue. For example, in \textit{Brown v. WellTech, Inc.},\textsuperscript{99} the

\begin{footnotes}
\item[92] For a discussion of daywork rates, see supra subsection II(C)(1).
\item[93] 360 So. 2d 642 (La. Ct. App. 1978).
\item[94] Id. at 643.
\item[95] Id.
\item[96] Id.
\item[97] Id.
\item[98] Id. at 644. In reaching this decision, the court distinguished the case of \textit{J.C. Trahan Drilling Contractor, Inc. v. Cockrell}, 225 So. 2d 599 (La. Ct. App. 1969), writ ref’d, 254 La. 922, 228 So. 2d 482 (1969), wherein the contract required the contractor to condition the hole for the setting of casing.
\item[99] 769 S.W.2d 637 (Tex. App.—El Paso 1989, writ denied).
\end{footnotes}
driller agreed to deepen an existing well by 700 feet. The operator sued for damages, and the driller counterclaimed for payment of the contract price. The operator argued that the driller had agreed to a turnkey contract, but the driller argued that the contract was of the daywork type. Because the stated consideration was a specified rate per day, the driller properly characterized the contract. However, when the court remanded the case, it noted that a question of fact still existed as to whether the driller was entitled to compensation under the circumstances.

III. CONTENTS OF THE DRILLING CONTRACT

A. Illustrative Form of Contract

A model “Drilling Contract” and accompanying model “Exhibit A Bid Sheet and Drilling Order,” prepared under the sponsorship of the American Petroleum Institute, are reproduced as Appendix B and Appendix A, respectively. These documents illustrate the typical form and content of drilling contracts used by operators and drilling contractors. The Exhibit A Bid Sheet and Drilling Order is used to solicit bids, to delineate the technical specifications for the well, and to specify which party is to furnish certain materials and services necessary to complete the drilling project. When a contract is made, Exhibit A becomes part of and is incorporated into the Drilling Contract. The use of this format allows the contract form to be used as a master contract when the parties plan to drill additional wells.

B. Description of the Parties

The parties to a drilling contract are generally referred to as either the “operator” and “drilling contractor,” or “driller” and “contractor.”

100. Id. at 638.
101. Id.
102. Id.
103. Id. at 639-40.
104. Id. at 640.
105. See Appendix B; Appendix A.
106. See supra subsection II(B)(1).
107. See Appendix A. The API form also has an Exhibit B, a rider attached to the contract to incorporate federal regulations concerning the equal employment opportunity, affirmative action for veterans and handicapped workers, and environmental compliance. See Appendix B.
108. See Appendix A, Preamble; Appendix B, Article 1.
109. Not all drilling contracts follow this form. For example, the IADC forms combine the bid solicitation with the contract form, and the attached Exhibit A contains only technical specifications.
The operator has the legal right to drill a well on the particular tract of land to be developed. The operator may be an oil and gas lessee, an assignee of the lessee, a farmee, a designated operator under a joint operating agreement, or an unleased mineral interest owner. The operator entity could be a major oil corporation, a large or small independent oil corporation, a partnership, a limited partnership, a joint venture, or an individual.

The drilling contractor is generally a person or entity engaged in the business of drilling oil and gas wells. A drilling contractor could be anything from a large company operating many drilling rigs in a number of states, in foreign countries, or offshore, to a small company operating one or two rigs in one oil basin. Note that a drilling contractor may be a subsidiary of a major oil company which drills wells only for the parent company or other subsidiaries of the parent.

Generally, the operator will solicit bids from several drilling contractors. If the operator uses the API form, the operator would partially complete the contract forms (including Exhibit A) and submit them to several drilling contractors, inviting them to bid on the proposed well or wells. Drilling contractors may submit bids by completing the forms and executing them, and the operator may then accept one bid by executing the forms and by notifying the successful bidder. Often, however, additional negotiations occur before a final contract is completed.

The successful bidder is not necessarily the low bidder. Some specification provisions are frequently left blank when the bid solicitation is made. Since the drilling contractor is invited to complete the form and to submit a bid in accordance with certain specifications as completed by the drilling contractor, there are more variables in a bid than just the contract price. Moreover, operators may elect to accept a bid from a drilling contractor who has worked for the operator in the past, who has a reputation for completing drilling projects in a timely and workmanlike manner, or who has prior experience in the target area. Finally, the operator generally retains “the right to reject any and all bids.”

Once the operator has selected a drilling contractor, each party should be certain that the other is fully and properly identified. For example, corporations and partnerships should be identified by their full official names. Also, each party should be certain that the persons executing the contracts on behalf of a corporation, partnership, or other

110. See generally supra subsections III(A) and II(B)(1).
111. See, e.g., Appendix A, Preamble, last paragraph.
principals have the legal authority to do so.112

On the API forms, the operator and drilling contractor are identified by name on the first page of both the drilling contract form and the bid sheet and drilling order form. In addition, both the operator and the drilling contractor execute both forms. Throughout both forms, however, the operator is identified as the “operator” and the drilling contractor is identified as the “contractor.”113

In addition to specifying the parties to the contract, a well-drafted drilling contract provides for the designation of representatives to be contacted during the drilling operation.114 These representatives should be knowledgeable about drilling operations. They also should have the discretionary authority to make routine decisions concerning drilling operations and be able immediately to respond to any emergency situation, such as a “kick”—the encountering of unexpected pressure which, if not controlled, could result in a blowout. The operator’s representatives should be thoroughly familiar with the drilling process and understand the precise circumstances under which a footage or turnkey contract reverts to daywork operations.

C. Respective Obligations of the Parties

1. Well Location

Because the operator probably has better access to relevant topographical, geological, and geophysical information, the operator should always designate the well location when soliciting a bid for the drilling of a specified well. The operator ordinarily provides a survey of the tract to be drilled and stakes the well location. Accordingly, the operator should be certain that the location will comply with applicable well-spacing regulations. If the well is to be drilled as a directional well, both the surface and bottom-hole locations should be identified. The contractor’s job then is to drill the well at the designated location in accordance with the contract specifications.

In Callon Petroleum Co. v. Big Chief Drilling Co.,115 the drilling contract specified that the operator was to stake the well location. The

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112. See supra subsection I(B)(2).
113. See Appendix A; Appendix B.
115. 548 F.2d 1174 (5th Cir. 1977).
location, staked by a third party hired by the operator, was not the location specified in the contract. The contractor had requested the third party to relocate the stake about sixty feet to the northeast of the contract site. Ostensibly, the operator had agreed to this change; however, the actual staked location was about 122 feet northeast of the contract site.

The drilling contractor commenced the well at the staked location and had drilled 9,000 feet when the operator protested. Litigation ensued over who was responsible for the increased cost of directionally drilling the well. The purpose of directional drilling was to ensure that the well would bottom out at the location called for in the contract, which was also the permitted location approved by the Mississippi Oil and Gas Board. The trial court directed a verdict in favor of the operator and the third-party contractor. On appeal, the Fifth Circuit viewed the preparation of a drill site as a condition precedent to the obligation of the drilling contractor to drill a well. Here, however, since the contractor had a role in the changed location, the court concluded that, under certain circumstances, the operator's condition precedent to prepare the location could be attributed to the contractor, such as where the contractor wrongfully induces the third party to move the location without advising the operator. This being a question of fact for a jury, the court concluded that a directed verdict was improper. The court also stated that a drilling contractor could not "negligently disregard what it knew or reasonably should know and drill a well contrary to the express terms of its drilling contract."

The drilling contractor must know the well location because the cost of moving the rig to the well site and setting up (rigging up) the rig, the cost of transporting the crew to and from the well site, and the potential cost of housing the crew at the well site depend upon distances and topography. In addition, environmental, zoning, or road load-limit regulations may increase drilling costs at particular locations.

Generally, the bid sheet/drilling order form contains provisions

116. Id. at 1177.
117. Id.
118. Id. at 1178.
119. Id.
120. Id.
121. Id.
122. Id.
123. Id.
124. Id. at 1179.
125. Id. at 1180.
126. Id. at 1179.
identifying the proposed well by name and number, identifying the name of the oil or gas field or prospect, giving the legal description of the tract on which the proposed well is to be drilled, and identifying the location of the well.\textsuperscript{127} As previously mentioned, the operator is responsible for the survey of the well site and staking the precise location of the well.\textsuperscript{128} The model forms specify that the well location specified in the contract is for "contract identification only and Contractor assumes no liability whatsoever for a proper survey or location stake on Operator's lease."\textsuperscript{129}

2. Well-Hole Specifications

The operator should specify the anticipated depth of the well in the bid sheet/drilling order. The depth should be expressed as depth from the surface location, not from sea level.\textsuperscript{130} While a well-drafted drilling contract allows for the possibility of deeper drilling, the contract should specify a maximum depth.\textsuperscript{131} Specifying a maximum depth is important as the contractor must be certain that its rig is capable of drilling to that depth. Also, because the drilling contractor usually furnishes the drill pipe, the contractor must have sufficient pipe to drill the well to the specified depth.

Because the depth of the hole will necessarily affect drilling costs,\textsuperscript{132} the operator must be extremely careful to specify a depth below \textit{surface} sufficient to test the targeted formation. On the other hand, the operator should also be careful to avoid overstating the depth, as this may needlessly increase the bid price.

In \textit{Ryan v. Fitzpatrick Drilling Co.},\textsuperscript{133} the parties to a contract to drill a shallow well underestimated the depth of the target formation by about 700 feet.\textsuperscript{134} The basic compensation to be paid the contractor was

\begin{itemize}
\item \textsuperscript{127} See, e.g., Appendix A, Article 1.
\item \textsuperscript{128} See, e.g., Appendix A, Articles 1 and 5.2.
\item \textsuperscript{129} Appendix A, Article 1. \textit{See also} Appendix C, Article 1; Appendix D, Article 1.
\item \textsuperscript{130} Appendix E, Article 3. \textit{Cf.} Appendix A, C, and D, which do not specify depth from \textit{surface}.
\item \textsuperscript{131} See, e.g., Appendix A, Article 3.3. Depth specifications can be modified during the course of performance based on the conduct of the parties. See, e.g., Bankoff v. Wycoff, 233 F.2d 476 (10th Cir. 1956); Thomas & Duffield Drilling Co. v. Cobb, 398 P.2d 852 (Okla. 1965), and discussion of these cases \textit{infra} subsection II(C)(6).
\item \textsuperscript{132} Under a daywork contract, the contractor is paid for each day's work. Generally, the time needed to drill a well grows disproportionately greater as a well gets deeper. For example, "trips" in and out of a deep well take longer than trips in and out of a shallow well. See Appendix F for a discussion of the drilling process. Under the typical footage or turnkey contract, the terms of compensation will revert to daywork for any drilling below contract depth. See \textit{supra} subsections II(C)(2) and II(C)(3).
\item \textsuperscript{133} 139 Colo. 471, 342 P.2d 1040 (1959).
\item \textsuperscript{134} \textit{Id.} at 473, 342 P.2d at 1041.
\end{itemize}
$20,000, plus a one-fourth interest in the completed well. The contract provided that the well was to be drilled "to a depth sufficient to test the Curtis sand or to a total depth of 4300 feet." The contract further provided "after the Schlumberger electric log has been run the contractor's obligations have been full-filled, (sic) and any work performed after that will be borne 25% by the Contractor, 75% by the Operator." The appellate court affirmed the trial court holding, which was based in part on testimony concerning custom and usage, that the contractor is entitled to be paid in full for the costs of drilling below 4,300 feet on a quantum meruit basis. In reaching its decision, the court quoted from Parkford v. Union Drilling & Petroleum Co.: Notwithstanding the depth specifications, the operator will reserve the right to order that drilling cease at any time. In contrast, the drilling contractor's right to stop drilling is more limited. In general, a contractor may cease drilling operations if there is concern over the operator's solvency, if the operator has failed to compensate the contractor in a timely manner in accordance with the contract terms, or if unanticipated problems arise that are beyond the contractor's control. In addition to specifying depth, the contract bid sheet/drilling order should specify the minimum diameter of the hole at specified depths.

135. Id.
136. Id.
137. Id. at 476, 342 P.2d at 1042.
138. Id. at 477, 342 P.2d at 1043.
139. Id. at 478-79, 342 P.2d at 1044. The court required the operator to pay three-fourths of the additional drilling costs.
141. Ryan, 139 Colo. at 479, 342 P.2d at 1044-45 (quoting Parkford, 118 Cal. App. at 544, 5 P.2d at 443).
142. See, e.g., Appendix A, Article 3; Appendix B, Article 5.1.
143. See, e.g., Appendix B, Article 5.2.
144. See, e.g., Appendix B, Article 16.
145. See, e.g., Appendix A, Article 7.
The diameter of the hole is relevant in estimating drilling time and in determining the required diameter of the drill pipe, drilling bits, and casing. All of these specifications affect drilling costs. Generally, in a daywork contract, the drilling contractor will furnish the drill pipe, but the operator will furnish the drill bits and casing. In a footage contract, the drilling contractor will furnish the drill pipe and bits, but the operator will often furnish the casing. In a turnkey contract, the drilling contractor will often furnish pipe, bits, and casing. These expensive materials are a major cost variable in drilling contracts.

With the exception of directional wells drilled with whipstock equipment, drilling contracts call for a straight hole drilled perpendicular to the horizon. Since no well can be drilled at true vertical, a well-drafted contract will allow for a specified range of deviation, not exceeding the range allowed by conservation commission regulations. To ensure that the hole is drilled within the deviation range, the contract may call for deviation surveys at specified depth intervals during the course of drilling. In a footage contract, the drilling contractor generally assumes the risk that the hole will be straight, and it must perform, at the contractor's own expense, all deviation surveys specified in the contract. However, should the operator order additional surveys, those are performed at the operator's expense. In a daywork contract, the drilling contractor may agree to exercise due diligence and care to maintain a straight hole; however, the risk and expense of maintaining a straight hole is on the operator. An operator who has reason to believe that a hole may deviate from the accepted range should immediately order surveys so that the drilling contractor may not contend that the operator has waived the right to a straight hole.

146. See, e.g., Appendix A, Article 9; Appendix B, Article 8.5. If the operator fails to order specified deviation surveys, the right to such surveys may be waived. See, e.g., Augusta Oil Co. v. Watson, 204 Kan. 495, 464 P.2d 227 (1970) and discussion of this case infra subsection II(C)(6).
147. See, e.g., Appendix B, Article 8.5.
148. See, e.g., Appendix B, Article 8.5. In the IADC daywork form, the contractor makes no representations concerning the drilling of a straight hole. See generally Appendix C.
149. See Jordan Drilling Co. v. Starr, 232 S.W.2d 149, 160 (Tex. Civ. App.—El Paso 1949, writ ref'd n.r.e.), wherein the court, on rehearing, held that the operator under a footage contract had not waived the right to a straight hole where the contractor had assured the operator that the hole was within the acceptable deviation range, but which in fact was not. In contrast, in Matador Drilling Co. v. Post, 662 F.2d 1190 (5th Cir. 1981), the drilling contractor was not liable for a 21-degree deviation, even though the contractor had taken deviation surveys showing only a minor deviation and had submitted them to the operator.
3. Time for Performance

The operator will specify a commencement date in the bid sheet/drilling order. The commencement date may be vital to the operator who has an oil and gas lease which is about to expire or which is approaching a delay-rental anniversary date. The continuing validity of the lease may well depend upon having "commenced" a well on the leased premises by a certain date.

The commencement date also may be vital to the drilling contractor, since the contractor must anticipate whether a rig will be available to commence drilling operations by the date specified in the bid sheet/drilling order. This can pose a dilemma for a drilling contractor. To be profitable, a drilling contractor must keep rigs and crews busy. However, a drilling contractor cannot precisely estimate drilling time as there is a substantial risk that unanticipated delays may occur while drilling a prior well which prevents the rig from being "released." Although this is a significant problem when rig activity is high, in times of low demand for drilling rigs, this problem is less likely to occur.

The API bid sheet/drilling order form provides that "[c]ontractor agrees to use best efforts to commence operations for the drilling of the well(s)" by the specified commencement date. The term "best efforts" has been judicially defined in a relatively small number of cases concerning a variety of contractual disputes. One case has defined "best efforts" as a duty of performance more demanding than mere due diligence or good faith, even if done at a financial loss to the party owing performance. Thus, the immediate risk of failing to commence a well on time is on the drilling contractor. However, under the API bid sheet/drilling order form, the contractor's liability for failure to commence a well on time is limited to specified liquidated damages. Also, the contractor's acceptance of the terms of the bid sheet/drilling order are "[s]ubject to rig availability." When the "best efforts" standard is combined with the "subject to rig availability" clause, there appears to be an ambiguity that may invite litigation. Is the drilling contractor's duty to commence a well by the commencement date subject to the "best efforts" standard only when a

150. See, e.g., Appendix A, Article 2.1.
151. Appendix A, Article 2.1.
154. See, e.g., Appendix A, Article 15.C.1.
rig is available? Or must the contractor also use "best efforts" to ensure rig availability? Given the more specific nature of the "best efforts" clause, a court might adopt the latter interpretation, even though the parties, especially the drilling contractor, may have intended a less stringent, objective, good faith standard—that the drilling contractor would act reasonably and prudently in view of the mutual interests of the operator and contractor to commence a well by the date specified in the contract. 156 In any event, the parties must have intended for "best efforts" to mean more than a mere subjective good faith effort to secure a rig and commence a well.

Failure to comply with the commencement deadline is most serious if drilling never begins. When an operator acquiesces to the late commencement of a well, the operator may be estopped from asserting the breach. This may be true even in a contract where time was expressed to be "of the essence." 157

The drilling contract usually contains a provision concerning the duration of the contract. In the unusual circumstance where an operator needs to complete a well within a specified time, 158 the contract may require that a well be completed to a specified depth by a stated date. However, a prudent drilling contractor would most certainly hesitate to sign such a contract. More often, the contract will state a general duration. For example, the API bid sheet/drilling order form provides that the contract "shall remain in full force and effect until operations are completed on the well or wells . . . or for a term of __________." 159 As between these alternative durations, this clause does not specify "whichever is sooner" or "later." Thus, the parties should specify one of these alternatives and delete the other, even though the form does not suggest that this be done. The latter provision should be used when the form is used as a master contract which contemplates the drilling of multiple wells. An ambiguity results if the well completion clause is not deleted

156. The IADC forms provide that the contractor shall "use reasonable efforts to commence" drilling. Appendix C, Article 2; Appendix D, Article 2; Appendix E, Article 2.1. Like the API form, the IADC forms also provide that the contractor's acceptance of the contract is "subject to rig availability." Appendix C, Article 24; Appendix D, Article 29; Appendix E, Article 27.

157. See Houy v. Davis Oil Co., 175 Colo. 180, 185-86, 486 P.2d 18, 21-22 (1971). Where the drilling contract does not make "time of the essence," and most do not, the contractor's duty of timely performance will be determined according to the contract doctrine of substantial performance. See Argos Resources, Inc. v. May Petroleum Inc., 693 S.W.2d 663, 664-65 (Tex. App.—Dallas 1985, writ ref'd n.r.e.).

158. This situation could arise where the operator's lease was about to expire and did not contain a well completion clause.

159. Appendix A, Article 2.2.
and a time period is inserted. Perhaps such a contract would be valid for the time reasonably needed to complete the specified drilling operations but not exceeding the specified time period. Perhaps the contract would be valid for the specified time period with the drilling contractor being available for additional drilling operations that may be accomplished within that time period. Or perhaps the contract is valid for whatever time is needed to complete the well, notwithstanding the time period.

In *Toce Oil Co. v. Great Southern Oil & Gas Co.*,\(^\text{160}\) the drilling contract specified that the well was to be completed by the end of calendar year 1985 so that all drilling expenses could be allocated to that year for tax purposes. Great Southern, the drilling contractor, proposed a turnkey drilling contract with commencement "'predicated by rig availability.'"\(^\text{161}\) The operator executed the contract and attached a cover letter stating that its "'acceptance is predicated on Great Southern timely providing a rig to drill the subject well during the early part of December so that drilling operations are completed before the end of the year.'"\(^\text{162}\) At the bottom of the one-page letter was the statement: "'ACCEPTED AND AGREED TO THIS 18th DAY OF NOVEMBER, 1985. GREAT SOUTHERN OIL & GAS CO., INC.'"\(^\text{163}\) Below this was a signature line for the contractor's agent. Great Southern's agent executed this letter and returned it to the operator.\(^\text{164}\) After the operator had prepared the drill site, Great Southern refused to drill the well, prompting the operator to enter into a new contract with a second contractor on December 20 for $22,000 more than Great Southern was to be paid.\(^\text{165}\) Because the calendar/tax year was about to close, the operator prepaid the drilling price. Nonetheless, the drilling of the well was never completed, and the second contractor filed for bankruptcy in early 1986.

In a suit by the operator for the difference in drilling price between the two contracts and for other damages, the court affirmed the trial judge's conclusion that Great Southern had contractually bound itself to complete the well by the end of calendar year 1985.\(^\text{166}\) Great Southern had argued that the letter agreement did not bind it to drill a well, but was merely a "resolutory condition" allowing the operator to escape from the contract in the event that a drilling rig was not furnished in

\(^{161}\) Id. at 1086.
\(^{162}\) Id. at 1088.
\(^{163}\) Id. at 1087 (The emphasized portion of the quotation was handwritten.).
\(^{164}\) Id.
\(^{165}\) Id. at 1089.
\(^{166}\) Id. at 1090.
time to complete the well by the end of the calendar year.167 If the letter is construed against the operator (the party who drafted it), the language suggests that the contractor's interpretation may have been correct, although the operator must have intended the result reached by the court. However, the operator successfully argued that, even if the contractor's interpretation was correct, Great Southern had breached the contract before the "resolutory condition" arose. The operator was allowed to introduce parol evidence to show that Great Southern had a rig available to drill the well, but that it moved the rig onto other property in violation of the contractor's stated practice of servicing contracts in the order that they were executed.168 The lesson for a drilling contractor is clear: If a contractor does not want to be bound to commence or complete a well within a certain time, the contract should contain no language that could be construed otherwise, and a contractor should either service its contracts in the order that they were executed or specifically agree to a different schedule.

From the operator's perspective, clarification of contract duration is particularly important in a specially drafted term daywork contract which may call for payment of daywork rates for idle or standby time throughout the stated term.169 Also, a contractor drilling on a daywork basis may wish to be paid for a minimum number of days when drilling is completed earlier than anticipated. From the drilling contractor's perspective, clarification of the meaning of a stated time period may be important in a footage or turnkey contract, as compensation is earned per foot of hole drilled in the former and for a well drilled to total depth in the latter.

Occasionally, a dispute can arise about when the term of a contract commences, which in turn can lead to a dispute over the compensation due under the contract. In Wagner & Brown v. E.W. Moran Drilling Co.,170 the parties executed a drilling contract on an IADC daywork form.171 The contract called for a well to be drilled to a depth of 25,000 feet—a depth that, due to heavy rig demand, could only be reached by

167. Id. at 1088.
168. Id. at 1090-91.
169. For a case concerning a dispute over the duration of a daywork contract and the compensation due, see Wagner & Brown v. E.W. Moran Drilling Co., 702 S.W.2d 760 (Tex. App.—Fort Worth 1986, no writ) and discussion of this case infra.
170. 702 S.W.2d 760 (Tex. App.—Fort Worth 1986, no writ).
171. Id. at 762. The case does not specify the printing date for the form. However, the contract was executed on March 12, 1981.
new rigs coming out of construction. All daywork rates, including rig mobilization time (which the parties specifically defined as “[a]ll time from arrival on location to the time of spud”), demobilization time (which the parties specifically agreed included “tear down after rig release and setting off location”), repair time, standby time (which the parties specifically agreed included standby with or “without crews”), and force majeure time, were set at $11,000 per day.

The contract provided that the drilling contractor “agrees to use best efforts to commence operations for the drilling of well by approximately September 30 to October 30 . . . 1981 or as soon as Rig 30 is completely rigged up and ready to move to first location.” In addition, the printed form contained the following typed rider:

21.1 In that the full initial term of this contract is for a period of eighteen (18) months (550 days), the standby rate without crew will apply for each day the rig is not on an operating status for the Operator. Should the Operator terminate this contract before the eighteen month term is fulfilled, the Operator shall be obligated to the Contractor to pay the daily standby rate without crew . . . until this eighteen month term contract is concluded; however, the Operator will not be charged the standby rate without crew for the periods of time that this Contract is assigned to a third party operator at the same rates as outlined in . . . this Contract.

21.2 It is agreed . . . that the actual number of days required to move and rig up . . . Rig 30 from MORAN’s Wichita Falls yard to Wagner and Brown’s first location will be billed at the moving and mobilization rates as outlined in . . . the Contract plus actual costs of trucking and crane service . . .

In the event that the contract was terminated by the operator prior to commencement of operations, the operator agreed to pay for 550 days of rig time as liquidated damages. By mid-November, the rig had not yet been completely fabricated. However, the operator instructed the drilling contractor to move the rig to the drilling site and complete construction there. The drilling contractor complied by completing

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172. 702 S.W.2d at 762-63.
173. Id. at 763
174. Id.
175. Id. at 763.
176. Id.
177. Id. at 763 (The emphasized portion of the quotation was typed by the parties and the balance was part of the printed form.).
178. Id. at 764.
179. Id. at 765. The reported case does not reveal the reason for this instruction. Perhaps the operator needed to “commence” a well because the operator’s lease was about to expire.
construction at the drilling site and spudding the well on December 12, 1981. After 430 days of continuous drilling, the well reached a depth of 22,000 feet, and the operator ordered that all drilling operations cease. The drilling contractor removed the rig and awaited instructions "for further operations pursuant to the contract." The operator made no further use of the rig, but the drilling contractor billed the operator for an additional 120 days of daywork pursuant to the 550-day contract term. When the operator failed to pay, the drilling contractor brought suit for payment.

In defense, the operator conceded that the contract was for a term of 550 days, but argued that the contract term commenced with the date of execution (March 12, 1981), rather than the date of spudding (December 12, 1981), and further argued that no payment was due under the contract prior to the commencement of the well. Under the operator's interpretation of the contract, the 550-day term had already expired and the drilling contractor had been compensated for each day of actual drilling and for transporting, mobilization, and demobilization. Both parties relied on a "laundry list" of canons of construction. Based on a construction of the contract and given the heavy demand for rigs at the time of execution, the trial court agreed with the drilling contractor. However, the jury found that the 550-day term commenced on November 27, 1981, the date that the drilling contractor began to move the rig to the well site. The jury further found that demobilization took four days. Because the jury found that the operator had paid for these days of service, the jury awarded the drilling contractor day-rate damages for 101 days. In affirming the trial court, the appellate court called the contract a "term day-work contract," a contract which "provides for a specific amount of time during which the contractor receives payment for services" even where such services are not performed due to instructions from the operator.

Drilling contracts typically give the operator the unfettered discretion to order the cessation of drilling operations at any time prior to

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181. Id.
182. Id.
183. Id.
184. Id. at 765-66.
185. Id. at 767.
186. Id. at 767-68.
187. Id. at 769.
188. For a discussion of compensation due under a typical daywork contract, see supra subsection II(C)(1).
completion of the well. Also, the contract generally will allow the contractor a limited right to cease drilling operations due to the operator's insolvency, due to the operator's failure to pay the contractor in a timely manner in accordance with the contract provisions, or due to unanticipated problems that are beyond the control of the contractor. A well-drafted contract will clarify termination.

4. Permits Required for Drilling

The operator has the obligation to secure the drilling permit from the state agency regulating drilling operations, most frequently the oil and gas conservation commission. While the drilling contract should specify this, state oil and gas conservation regulations generally require the operator to secure the drilling permit and bond.

In addition to the drilling permit and bond, a number of other permits may be necessary. Special permits and bonds may be needed to transport the rig and other equipment over public roads or federal property, or to drill a water well to provide a water supply for the drilling operation. The need for special permits should be assessed, and the responsibility for securing any such permits should be specified.

5. Access to the Drilling Location

Generally, the operator is responsible for securing the legal right of access to the well site. This includes an access road to the well location and any necessary rights-of-way for power, fuel, or water lines. In addition, the operator is usually responsible for construction and maintenance of the access road right-of-way. The responsibility for installation of power, fuel, and water lines should be specified in the contract. In some states, the operator must compensate the owner of the surface estate for the use of the surface in the course of drilling and production.
The responsibility for payment of this compensation should be on the operator as part of the duty to secure legal access to the well site.

The contractor is generally responsible for actually transporting the drilling rig to the well site. In a daywork contract, the operator normally pays a mobilization fee to the drilling contractor for transportation. In footage and turnkey contracts, the cost of transportation is ordinarily absorbed by the drilling contractor and amortized over the depth of the well. With regard to other equipment, such as casing, the party responsible for furnishing the equipment would ordinarily be responsible for actually transporting that equipment to the well site. Note that the responsibility for actually transporting the drilling rig and other equipment to the well site and the responsibility for paying the cost of transportation may be divided.

6. Modification of Contract Terms in the Course of Performance

While the well location, well-hole specifications, and time for performance should be specifically expressed in the drilling contract, the parties will sometimes modify the contract during the course of performance. If the initial contract, or the contract as modified, fails to address all of the ramifications of the drilling project, litigation can result, especially over the drilling contractor's right to receive compensation. The following case discussion briefly illustrates this problem.

In Bankoff v. Wycoff, the drilling contract required the drilling contractor to drill a well to a specified depth at a footage rate payable upon completion of the hole. Just short of the specified depth, drilling problems were encountered. After twenty-two days of attempting to overcome these difficulties, drilling operations were terminated by mutual agreement of the parties. The court held that the drilling contractor was entitled to compensation at the specified footage rate since the agreement to terminate drilling operations meant the parties had agreed that the drilling contractor had fully performed the contract, as modified.

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199. Appendix A, Article 14.2a; Appendix C, Article 4.1.
200. Appendix A, Article 14.1; Appendix D, Article 4.1; Appendix E, Article 4.1.
201. See, e.g., Appendix A, Article 6.
202. See, e.g., Appendix A, Article 6, where the responsibility for providing and the responsibility of paying are separately addressed with respect to a long list of equipment, materials, and services.
203. On the related issue of oral modification of written contracts, see supra subsection I(C).
204. 233 F.2d 476 (10th Cir. 1956).
which was to drill a well to the depth actually reached at the time of termination.\textsuperscript{205}

In \textit{Thomas & Duffield Drilling Co. v. Cobb},\textsuperscript{206} the drilling contractor agreed to drill a well to a specified maximum depth or to a depth sufficient to test a specified formation. The well bore had entered part way into the specified formation when the operator ordered that casing be run based upon the recommendation of the operator's geologist. After learning that the hole was actually dry, the operator refused to pay the drilling contractor, contending that the well had not been drilled to a depth sufficient to allow for adequate testing of the formation. On appeal, the court held that the operator's decision to run casing modified the drilling contract and that the contractor had fully performed the contract as modified.

In \textit{Augusta Oil Co. v. Watson},\textsuperscript{207} the drilling contract called for deviation surveys at intervals of 500 feet and at such other intervals as the operator may request. The drilling contractor drilled two wells for the operator without performing any deviation tests, and the operator made partial payment on both wells. However, when the operator discovered that no deviation tests had been made, it refused to make further payments. The contractor sued, and the court held that the operator had accepted the drilling contractor's performance. Since the operator's representative was present at the well site during the course of drilling as required by the contract, the operator was found to have waived any right to object to the lack of deviation surveys.

D. Description of and Responsibility for Furnishing Equipment

A drilling contract should contain a detailed description of all equipment to be used, beginning with the type of rig and power source. Most drilling contracts contain detailed drilling rig specifications.\textsuperscript{208} Of course, the contractor furnishes the rig and a crew of sufficient size and experience to allow for proper drilling operations. Generally, the operator will furnish the storage tanks, drilling mud, separator, coring equipment, testing and completion services, and equipment.\textsuperscript{209} The API bid

\textsuperscript{205} See also Royal Oil and Gas Co. v. Buick Drilling, Inc., 141 Colo. 362, 348 P.2d 148 (1960). For a similar ruling concerning a turnkey contract, see Totah Drilling Co. v. Abraham, 64 N.M. 380, 328 P.2d 1083 (1958).

\textsuperscript{206} 398 P.2d 852 (Okla. 1964).


\textsuperscript{208} See, e.g., Appendix A, Article 4.

\textsuperscript{209} See, e.g., Appendix A, Article 5.
sheet/drilling order form contains detailed checklists which allow the parties easily to designate which party is to be responsible for furnishing and paying for specified equipment and services. Note that the obligation to secure certain equipment or services may be on one party, but the obligation to pay for such equipment and services may be on the other party. In addition, the contract will contain detailed specifications for casing, drilling fluids, coring, and testing.

E. Third-Party Services

While the drilling contractor and operator are the key parties in a drilling operation, various third parties supply services and materials needed to drill and complete a well. For example, well sites are prepared, and access roads, power, water, and fuel line rights-of-way are generally constructed and maintained by one or more construction contractors. Drilling bits, casing, tubing, reserve pit liners, and other supplies and equipment needed for drilling are generally supplied by various oil field equipment and supply companies. Drilling fluid (drilling mud) and the expertise to formulate the mud at the well site are generally furnished by a mud company. Logging and testing services are typically furnished by third-party specialists, and supplies, equipment, and expertise needed to complete or plug a well are generally furnished by independent contractors. Third-party contractors even furnish specialized drilling services, such as the technology for directional or horizontal drilling; these services are generally furnished on a daywork basis. Each of these third-party services should be governed by a written contract.

Drilling contracts should address several issues concerning third-party services: (1) What third-party services are or may be required? (2) Who selects the third party? (3) Who has control of and responsibility for the performance of third-party services? (4) Who is responsible for compensating the third party? (5) Who is liable for damages to equipment belonging to the third party or for personal injuries to the third party’s employees? (6) What insurance coverage for third-party services is to be secured, and who is responsible for securing it? Note that the

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211. See, e.g., Appendix A, Articles 7 to 12.
212. The International Association of Drilling Contractors has a Master Service Contract model form for use by the party (whether the drilling contractor or the operator) responsible for securing third-party services. See IADC Master Service Contract (Revised Dec. 1976). Copies may be obtained from the International Association of Drilling Contractors, P.O. Box 37414, Houston, Texas 77036. Some major operators and some third-party suppliers of specialized well services use pre-printed forms oriented to their respective interests.
latter five questions should be separately addressed as to each third-party supplier.

As previously stated, under the API bid sheet/drilling order form, the operator is responsible for selecting, controlling, and paying for any third-party services needed to prepare the well site and to provide access roads.\textsuperscript{213} The same is true for all drilling fluid (mud) services, coring, cementing, logging, testing, and completion services.\textsuperscript{214} As between the operator and the drilling contractor, most drilling contracts provide that the operator is to be in charge of formulating the drilling fluid mud, but the contractor is often responsible for controlling circulation in the hole and for making recommendations concerning the formulation. However, the operator generally will retain the services of a "mud engineer" to control pressure, the speed of the pumps, and related operations. Hence, the mud engineer is most frequently under the direct control of the operator.

In \textit{J.C. Trahan Drilling Contractor, Inc. v. Cockrell},\textsuperscript{215} drill pipe became lodged in the hole, allegedly as a result of an improper mud formulation. The contractor sued the operator for damages incurred in dislodging the pipe. The court ruled for the operator on the grounds that the contractor had implicitly consented to the formulation by not objecting to its use, because under the terms of the contract the contractor was "obligated to advise Owner and make recommendations to him in writing when, in Contractor's opinion, the mud program should be revised."\textsuperscript{216}

A number of other services, such as the installation of fuel and water lines, casing, and tubing, and the supplying of drill bits, fishing tools, and transportation services are left for negotiation.\textsuperscript{217} The API bid sheet/drilling order form contains a check list that allows the parties separately to designate the responsibility to provide and to pay for each of these third-party services.\textsuperscript{218}

\begin{itemize}
\item \textsuperscript{213} See, e.g., Appendix A, Articles 5.2 and 5.1.
\item \textsuperscript{214} See, e.g., Appendix A, Article 5.
\item \textsuperscript{215} 225 So. 2d 599 (La. Ct. App. 1969), writ ref'd, 254 La. 922, 228 So. 2d 482 (1969).
\item \textsuperscript{216} Id. at 602.
\item \textsuperscript{217} See, e.g., Appendix A, Article 6.
\item \textsuperscript{218} See, e.g., Appendix A, Article 6.
\end{itemize}
F. Consideration to be Paid

1. Types of Drilling Contracts

Key differences among the various types of drilling contracts concern the basis for payment of the compensation due the contractor and the allocation of risks in drilling the well.\(^\text{219}\) In a footage contract, except for specified operations which are conducted on a daywork basis, the contractor is paid a stipulated price per foot of hole drilled from the surface through the total depth of the well or some other specified objective, and risk is allocated largely on the basis of whether a specific operation is being conducted on a footage or daywork basis.\(^\text{220}\) The consideration is earned when the drilling has been completed in accordance with the contract terms.\(^\text{221}\)

A footage contract also contains a “standby” or “shut-down” time provision which provides for day-rate (daywork) compensation when specified circumstances result in the cessation of drilling operations. For example, the API form requires “daywork” compensation for (1) the drilling and setting of casing below the contract footage depth,\(^\text{222}\) (2) efforts to restore a hole which has been lost or damaged as a result of failure of the operator's casing or equipment or from failure of any cement job,\(^\text{223}\) (3) work performed at the operator's request beyond the scope of the work to be performed on a footage basis,\(^\text{224}\) (4) efforts (typically in excess of a specified number of hours) to restore lost circulation, (5) work performed to overcome abnormal pressures or other specified drilling problems,\(^\text{225}\) and (6) delays resulting from force majeure.\(^\text{226}\) In addition, if certain rock formations are encountered that make the drilling operation more difficult and time-consuming, the bid sheet/drilling

\(^{219}\) For a discussion of the differences among the various types of drilling contracts, see supra subsection II(C).

\(^{220}\) See, e.g., Appendix A, Article 14.1; Appendix B, Article 3.3.

\(^{221}\) See, e.g., Appendix B, Article 4.2.

\(^{222}\) See Appendix B, Article 4.2.a.

\(^{223}\) See Appendix B, Article 3.3.b. For an illustration of the type of dispute which may arise over an improper cement job in a case where the parties failed specifically to agree as to compensation for restoring the hole, see Jordan Drilling Co. v. Starr, 232 S.W.2d 149, 160-62 (Tex. Civ. App.—El Paso 1949, writ ref’d n.r.e.). In this case, which concerned a footage contract, the court held on rehearing that the drilling contractor failed to show that the operator had agreed to compensate the drilling contractor for redrilling a portion of the hole which was improperly cemented.

\(^{224}\) Work beyond the scope of the work to be performed on a footage basis includes coring, testing, logging, and completion or plugging operations. See Appendix B, Articles 3.3.d, 7.1, 8.3, 8.4, and 8.5. In the event the well is plugged, however, the contractor may be obligated to furnish a specified number of hours of rig time without charge. See Appendix A, Article 14.3.

\(^{225}\) See Appendix B, Article 3.3.c; Appendix A, Articles 16.1 and 16.2.

\(^{226}\) See Appendix B, Article 16.
order form provides for adjusted compensation on a daywork basis.\textsuperscript{227}

A day-rate or daywork contract provides that the drilling contractor is to be paid a stipulated price for work performed under the direction of the operator over a twenty-four-hour period, and the drilling contractor generally assumes only the specific risks enumerated in the contract or placed on the contractor as a matter of law. The daywork rate may vary with the particular operation being performed. For example, the API bid sheet/drilling order form allows for the day rate to be specified separately for transporting the rig to and from the well site, rigging up, rigging down, operating time, standby time, repair time, and force majeure time.\textsuperscript{228} Daywork rates may be reduced during periods when the drilling contractor does not maintain the specified “full crew” at the well site\textsuperscript{229} and may be proportionately reduced for fractions of days.\textsuperscript{230} Daywork compensation is usually payable on a specified periodic basis.\textsuperscript{231}

A turnkey contract provides that the drilling contractor is to be paid a stipulated price for the drilling of a well to a specified depth or to a targeted formation,\textsuperscript{232} and the contractor assumes all risks of drilling except as limited by the terms of the contract. If a commercial quantity of oil or gas is discovered, a turnkey contract may leave completion to the operator or may require the drilling contractor to complete the well. However, if the contractor is to complete the well, the contract will usually provide additional compensation for completion.\textsuperscript{233} Payment is due upon completion of all work specified in the contract.\textsuperscript{234}

A turnkey contract will often provide for payment of a day rate in specified situations.\textsuperscript{235} Typically, the specified situations are similar to those commonly found in a footage contract.\textsuperscript{236} Also, like the typical footage contract, the specified day rate may vary for operating time, standby time, repair time, and other specified situations.\textsuperscript{237}

\begin{footnotes}
\item[227] See Appendix B, Articles 3.3.c.; Appendix A, Article 16.3.
\item[228] See Appendix A, Article 14.2.
\item[229] See, e.g., Appendix A, Article 14.2.f.
\item[230] For example, the API drilling contract form allows for prorating the day rate in half-hour intervals. See Appendix B, Article 3.4.
\item[231] See, e.g., Appendix B, Article 4.2, which provides for monthly payments.
\item[232] See, e.g., Appendix E, Article 4.1.
\item[233] Turnkey contracts often leave completion responsibilities to the operator. See supra subsection II(C)(3).
\item[234] See, e.g., Appendix E, Article 5.1.
\item[235] See, e.g., Appendix E, Articles 4.2-4.7.
\item[236] See supra subsection II(C).
\item[237] See, e.g., Appendix E, Articles 4.2-4.5.
\end{footnotes}
In addition to the rate of compensation and the method of calculation (footage, daywork, or turnkey), operators must be mindful of other contractual provisions that may affect total costs. For example, the contract should specify the party responsible for furnishing drilling bits, casing, cement, drill pipe, and other special tools and equipment. Also, the contract should specify the party responsible for paying subcontractors. Finally, modern contracts may contain cost-adjustment provisions to allow for the raising or lowering of contract rates in the event the costs of drilling materially change. Cost-adjustment provisions are difficult for the drilling contractor to obtain in a depressed oil and gas economy or in a non-inflationary environment and therefore are usually deleted from the model forms. However, the need for cost-adjustment provisions is less important in a depressed economy since the large number of available rigs tends to encourage short-term (one-well) contracts. Nonetheless, from the drilling contractor’s perspective, protection against increased costs due to changes in government law, rules, and regulations is especially important.

2. Stoppage of Work
   a. By Operator

A well-drafted drilling contract allows the operator to order the contractor to stop work at any time. If the operator exercises this right, the drilling contract should specifically provide for the drilling contractor’s compensation. The rate of compensation usually depends upon the timing of the operator’s order.

If the operator terminates the drilling contract before the contractor commences operations, most contracts call for the payment of a flat sum of money, often characterized as liquidated damages. This applies to footage, daywork, and turnkey contracts. Liquidated damages are specified because actual damages are hard to ascertain and because special or consequential damages, such as lost job opportunities, are specifically prohibited by the contract.

238. The API bid sheet/drilling order form contains numerous provisions concerning the identification of the party responsible for the expense of supplies, tools, and equipment. See Appendix A, Articles 5 and 6.
239. See supra subsections III(D) and (C).
240. See, e.g., Appendix A, Article 14.4.
241. See, e.g., Appendix A, Article 14.4.g.
242. See, e.g., Appendix B, Article 5.1.
243. See, e.g., Appendix A, Articles 15.A.1 and 15.B.1; Appendix E, Article 6.3(a).
244. See, e.g., Appendix B, Article 11.9; Appendix E, Article 17.16.
When the operator terminates the drilling contract after the drilling contractor has commenced operations, but prior to actual spudding of the well, most contracts provide for the operator to compensate the drilling contractor for actual expenses incurred in performance of the contract and expenses resulting from the early termination (excluding crew costs and supervision), plus a percentage of such expenses. In addition, some contracts provide for an additional day-rate charge (often equal to the standby rate) from the date of commencement through rigging down (dismantling operations). This applies, with slight variation, to footage, daywork, and turnkey contracts, although turnkey contracts may only address pre-commencement and post-commencement operations.\textsuperscript{245}

When the operator terminates a footage or daywork drilling contract after the well has been spudded, such contracts usually provide for the drilling contractor to be compensated in accordance with the general contract terms for the work actually performed up to the date of termination. In other words, under a footage contract, the drilling contractor is entitled to compensation on a footage basis based upon the number of feet drilled and for any daywork done under such contract plus expenses and, perhaps, specified liquidated damages.\textsuperscript{246} Under a daywork contract, the drilling contractor is entitled to compensation for the total number of days of compensable drilling operations at the applicable rates. In addition, the daywork contract may provide for a minimum and a maximum payment.\textsuperscript{247}

\textbf{b. By Drilling Contractor}

As stated above, the drilling contractor has only a limited right to terminate the drilling contract prior to completion of the well, such as upon the operator's insolvency, failure to pay contractor on a timely basis,\textsuperscript{248} or drilling problems that are beyond the contractor's control.\textsuperscript{249} If the drilling contractor lawfully terminates the contract, the contractor is generally entitled to whatever compensation would be payable in the

\textsuperscript{245} See, e.g., Appendix A, Articles 15.A.2 and 15.B.2; Appendix E, Article 6.3(b).
\textsuperscript{246} See, e.g., Appendix A, Article 15.A.3. In drafting termination provisions in footage contracts, the drilling contractor should be careful that the compensation due will be adequate to ensure recovery of costs that were to be amortized over the total depth of the well, such as transportation costs or the cost of any specially purchased equipment.
\textsuperscript{247} See, e.g., Appendix A, Article 15.B.3.
\textsuperscript{248} See, e.g., Appendix B, Article 5.2.
\textsuperscript{249} See, e.g., Appendix B, Article 16. See also supra subsection III(C)(3).
event the operator had terminated the drilling contract. In addition, most drilling contracts provide for a specified rate of interest in the event the operator fails to make timely payments and for the recovery of reasonable attorney's fees incurred in collecting any payment due under the contract. If the drilling contractor unlawfully terminates the drilling contract, the operator would have a cause of action for breach of contract; however, some drilling contracts specify liquidated damages for such a breach.

3. Lien Rights of Drilling Contractor

If the operator fails to pay the drilling contractor for work performed in accordance with the drilling contract, the laws of many states provide the contractor with a statutory lien on the operator's interest in the well, the property on which the well is drilled, or both. In addition, the lien will generally cover all wellhead equipment and any production belonging to the working-interest owners. This statutory-lien protection may be a general mechanic's or materialman's lien act, or may be a special well-drilling lien act aimed specifically at protecting drilling contractors and subcontractors. The theory behind these liens is that the contractor should have a lien against the developed property to secure payment for well-drilling services which may have materially increased the value of the property.

When these liens arise, the manner of perfection and their priority relative to other liens and encumbrances vary from state to state. In order to gain the protection of these liens, however, the drilling contractor must be certain to comply with all of the statutory requirements governing their creation, perfection, recordation, and execution. Detailed

250. See, e.g., Appendix B, Article 5.2. For a discussion of such compensation, see supra subsection III(F)(2)(a).
251. See, e.g., Appendix B, Articles 4.4 and 4.5. A Texas case has held that the amount of interest specified in a drilling contract is limited only by federal law. See Wagner & Brown v. E.W. Moran Drilling Co., 702 S.W.2d 760, 771-73 (Tex. App.—Fort Worth 1986, no writ) (citing the Depository Institutions Deregulation and Monetary Control Act of 1980, 12 U.S.C. § 86a (1982), and holding that such Act preempted state usury law which limited contractual rates of interest).
252. See, e.g., Appendix A, Article 15.C.1. For additional discussion of default by the drilling contractor, see infra subsection III(G).
255. For example, in Adobe Oil & Gas Corp. v. Getter Trucking, Inc., 676 P.2d 560 (Wyo. 1984), the contractor, under the terms of the daywork drilling contract, was responsible for the cost of moving the rig onto the location and for rigging-up. Id. at 561 n.1. The contractor hired a third-party subcontractor to transport the rig from North Dakota to Wyoming and to set up the rig for drilling. Id. at 560. When the subcontractor was not paid, the subcontractor asserted a lien against
discussion of these matters is beyond the scope of this article. Note, however, that such liens may be of little value if the well is plugged and abandoned as a dry hole. The best protection for a drilling contractor is a creditworthy operator. If a drilling contractor is concerned about whether the operator is creditworthy, a prudent contractor should have the compensation prepaid, placed in escrow, or guaranteed by a third party.

In addition to the drilling contractor, third parties may have a statutory lien for labor, services, or materials furnished in a well drilling process. Some of these third parties may be fulfilling obligations that the drilling contractor assumed under the drilling contract. The model forms require the contractor to drill a lien-free well. In other words, the contractor will pay all claims made by others in the performance of obligations assumed by the contractor. Breach of this provision by the contractor, however, is not by itself material so as to excuse the operator's performance.

In Houy v. Davis Oil Co., the drilling contractor drilled two wells in accordance with the drilling contract except that, prior to completion, the contractor encountered financial difficulties and failed to pay some third-party suppliers who filed liens on the operator's property. The operator and drilling contractor then entered into a supplemental agreement, whereby the operator agreed directly to pay off the lienors and make a partial payment to the contractor. Upon completion of the wells, the operator then refused to pay the balance of the contract, citing the contractor's breach of the covenant to drill a lien-free well. The trustee in bankruptcy brought suit on behalf of the drilling contractor, and the operator counterclaimed for damages. The case was dismissed, and on appeal the court held that the contract had been substantially performed and that the operator was liable for the balance due under the contract since the wells were completed in a good and workmanlike manner. Of course, the operator was allowed to credit the

the oil and gas property. Id. In reversing the trial court, the Wyoming Supreme Court ruled that since the operator was not contractually responsible for transporration and rigging-up costs, the subcontractor could not assert a lien against the property of the operator. Id. at 564-65. Not all such statutes are construed so narrowly.

256. For more information, see Wickes & Haas, Oil and Gas Liens, 31 ROCKY MTN. MIN. L. INST. 18-1 (1985).
257. See, e.g., Appendix B, Article 12.3.
259. Id. at 182, 486 P.2d at 20.
260. Id. at 183, 486 P.2d at 20.
261. Id. at 184, 486 P.2d at 21.
G. Drilling Contractor's Default

1. In General

If a drilling contractor fails to drill the well in accordance with the terms and specifications of the drilling contract, the operator has a cause of action for breach of contract. Under general contract law, the operator is entitled to compensation for any damages suffered as a result of the drilling contractor's breach. The measure of damages used to determine the compensation due the operator varies from state to state and from case to case. This section will briefly review the various methods of measuring damages and summarize how typical contracts provide for alternative or substitute remedies.262

A traditional measure of damages for breach of the promise to drill a well is the reasonable cost of drilling the well or, if drilling has commenced, the reasonable cost of completing the well in accordance with the contract.263 This measure of damages has been criticized as too generous when the evidence suggests that the well would have been a dry hole.264 Yet, the rule has been applied in several jurisdictions, including Colorado, Kansas, Louisiana, Montana, and Oklahoma; it has been rejected in California, Texas, and Alberta, Canada.265

Another measure of damages is lost profits to the operator.266 This remedy may be difficult to prove in the absence of actual production and, if the evidence indicates that the well would be a dry hole, the contractor may be liable only for nominal damages. Nevertheless, this remedy enjoys some support among oil and gas law scholars, at least as a supplemental remedy to the loss-of-value measure of damages discussed in the following paragraph.267

262. For more information, see 5 H. WILLIAMS & C. MEYERS, OIL AND GAS LAW §§ 885-885.5 (1989) and 4 W. SUMMERS, THE LAW OF OIL AND GAS § 689 (1962).
263. Fite v. Miller, 196 La. 876, 200 So. 285 (1940). In Haynesville Oil Co. v. Beach, 159 La. 615, 105 So. 790 (1925), the contractor ceased drilling under a footage contract and moved the rig to a new location in order to take advantage of a more profitable contract. Id. at 619, 105 So. at 791. The operator hired another contractor to finish the well at considerable expense. Id. at 619, 105 So. at 791-92. The court awarded damages equal to the difference between the balance that would have been due the contractor had the well been completed in accordance with the contract and the additional costs, less some credits. Id. at 619, 105 So. at 792.
266. By analogy, see Guardian Trust Co. v. Brothers, 59 S.W.2d 343 (Tex. Civ. App.—Eastland 1933, no writ), a case awarding lost royalty to a nonworking-interest owner.
The loss-of-value measure of damages has been characterized as "the difference in the market value of the [operator's] interests when the promised well was not drilled and the value if the promised well had been drilled.\textsuperscript{266} While many courts appear willing to accept this measure of damages, operators may have difficulty proving these values and may even have to prove loss of specific bargain—that they would have sold their interest in the property had the well been drilled.\textsuperscript{269} Not all courts, however, are so strict.\textsuperscript{270}

Still other courts have awarded damages based upon the value of the information that would have been secured had the well been drilled.\textsuperscript{271} In general, the value of the information often is determined by ascertaining what additional costs the operator would incur in order to obtain the information.\textsuperscript{272}

In addition to the above measures of damages, some courts have been willing to compensate the operator for consequential damages such as the value of a leasehold lost by reason of the drilling contractor's breach.\textsuperscript{273} Other courts, however, have denied the recovery of consequential damages where proof was regarded as too speculative.\textsuperscript{274} Modern forms specifically prohibit liability for consequential damages.\textsuperscript{275}

If the drilling contractor has committed a material breach of contract, the operator may be able to rescind the drilling contract and recover monies already paid the drilling contractor.\textsuperscript{276} Where the well has been partially drilled and the operator wishes to complete the well, the operator may elect to petition a court in equity for the appointment of a receiver to complete the well with the use of the drilling contractor's equipment.\textsuperscript{277} However, the remedy of specific performance (requiring

\textsuperscript{266} H. WILLIAMS \& C. MEYERS, supra note 262, § 885.3.
\textsuperscript{269} See Riddle v. Lanier, 136 Tex. 130, 145 S.W.2d 1094 (Tex. Comm'n App. 1941, opinion adopted); see also H. WILLIAMS \& C. MEYERS, supra note 262, § 855.3.
\textsuperscript{270} See, e.g., Cockburn v. O'Meara, 155 F.2d 340 (5th Cir. 1946) and Durbin Bond \& Co. v. Gillis, 242 F.2d 176 (5th Cir. 1957). The rule requiring operators to prove the loss of a specific bargain has been criticized when used in situations where the operator had no intention of selling the property. H. WILLIAMS \& C. MEYERS, supra note 262, § 885.3.
\textsuperscript{271} See discussion H. WILLIAMS \& C. MEYERS, supra note 262, § 855.4.
\textsuperscript{273} See, e.g., Riddle v. Lanier, 136 Tex. 130, 145 S.W.2d 1094 (Tex. Comm'n App. 1941, opinion adopted).
\textsuperscript{274} See, e.g., Gibson v. Texas Co., 239 S.W. 671, 678 (Tex. Civ. App.—Texarkana 1922, writ dism'd).
\textsuperscript{275} See, e.g., Appendix B, Article 11.9.
Because of the various remedies and methods of measuring damages and the resulting variance in exposure to the risk of having to pay or absorb such damages, one might expect to find detailed provisions in model drilling contract forms addressing the available remedies and measure of damages in the event of the drilling contractor's default. Some early contracts simply included a liquidated damages provision providing a certain remedy agreed upon in advance. The major disadvantage to a liquidated damages provision lies in the reluctance of some courts to enforce the provision when the specified damages bear no reasonable relation to the actual damages suffered. Although the modern trend is toward the enforcement of such provisions, the typical drilling contract limits the operator to a recovery of liquidated damages only when the drilling contractor "fails to commence operations in accordance with the terms hereof and terminates this Agreement." Other than situations where the drilling contractor fails to commence operations, no general measure of damages is expressed in the contract for other default by the contractor. Damages, however, are limited because the API drilling contract form provides that "[n]either party shall be liable to the other for special, indirect, or consequential damages resulting from or arising out of this Agreement, including, without limitation, loss of profit or business interruptions, however same may be caused, except as set forth in Section 15 of the Drilling Order." In addition, the API drilling contract form gives the operator the option, "[i]n the event of unreasonably slow progress, carelessness, inattention, or incompetency on the part of Contractor," to take possession of the well and the drilling contractor's equipment and to either drill the well to completion or abandon the well. This can be done only if the operator gives the drilling contractor prior notice and a reasonable opportunity to remedy the unsatisfactory performance. However, if there is an imminent threat of a blowout or other hazard, the operator may immediately take over the well without notice to the contractor. If the operator takes over the well, the API contract form provides for partial compensation to the drilling contractor for use of the contractor's rig and equipment. The operator must use

278. See, e.g., Jeffers v. Rondeau, 1 S.W.2d 380 (Tex. Civ. App.—Fort Worth 1927, no writ).
280. See H. Williams & C. Meyers, supra note 262, § 885.5.
281. Appendix A, Article 15.C.1.
282. Appendix B, Article 11.9.
283. Appendix B, Article 6.1.
its own employees or those of a third party. Since this self-help option is not written in exclusive terms, the operator should have the right to seek any remedies provided by general contract law, subject to the express provision prohibiting the recovery of special or consequential damages.

In interviews with representatives of operators and drilling contractors, the author failed to turn up a situation where this self-help option had been exercised. A prudent operator should hesitate to exercise the option to elect to take over a well. First, the threshold test for the exercise of the right is “[i]n the event of unreasonably slow progress, carelessness, inattention, or incompetency on the part of Contractor in performance of the work.” Reasonable minds could differ on whether this test is met in a given situation. Thus an operator should consider this election only in circumstances where this test is clearly met and after the operator has given the contractor written notice of the inadequate performance and a reasonable opportunity to correct the problem. Second, many operators would not have the experience or the trained employees to take over drilling operations. Consequently, this election is not likely to be a practical remedy. Third, in the event the operator exercises this right, the operator should be certain that all insurance policies remain in full force and effect. If such policies terminate, the operator would need to obtain its own coverage. This could be costly, time-consuming, and even impossible to secure.

Finally, in the event of imminent blowout or other hazards, a prudent operator should be especially reluctant to take over a well unless the contractor is clearly incompetent or fails to respond reasonably to the urgency of the problem. Note, however, that such a circumstance may place the operator in a “catch 22” position. Conceivably, parties injured as a result of the problem could assert that the operator was negligent or reckless in failing to take over a well where the drilling contractor was obviously incompetent and where a reasonably prudent operator would have elected to exercise the right. Thus, this option potentially presents more problems than solutions for the operator, especially under a footage or turnkey contract where the operator assumes less risk. In the case of a

284. See id.
285. See Appendix B, Article 11.9.
286. Appendix B, Article 6.1.
287. The model forms contemplate this problem, but the forms cannot resolve the matter.
daywork contract under which the operator is truly directing and supervising the day-to-day drilling operations, the reservation of such an option may have some merit.

2. The Texas Deceptive Trade Practices—Consumer Protection Act

While a complete discussion of the Texas Deceptive Trade Practices—Consumer Protection Act is beyond the scope of this paper, the Act can be used by an operator who is the victim of a deceptive trade practice. In *Pool Co. v. Salt Grass Exploration, Inc.*, the drilling contractor represented that its “power swivel” drilling rig could drill the specified well, when in fact the rig did not have that capability and was ordinarily suited for use as a workover rig. The court affirmed the trial court decision that such a representation violated the Act. Because violation of the Act can be costly, drilling and related service contractors must be extremely careful not to misrepresent their equipment, services, and abilities. If litigation ensues, the party found to have violated the Act can be liable for actual damages, statutory treble damages, costs, and attorney’s fees.

H. Description of Casing and Cementing Programs

Casing, tubing, and related cementing services are customarily provided by the operator in both footage and daywork contracts. While such items customarily would be furnished by the drilling contractor in a classic turnkey contract, modern modified turnkey contracts allow the parties to designate this responsibility.

In addition to identifying the party responsible for providing casing, tubing, and cement, a well-drafted drilling contract must include technical specifications for the casing and cementing programs. These specifications include the outside diameter of each casing string, the minimum hole diameter needed to accommodate each casing string, the proposed depth of each casing string, the estimated quantity of cement, the hours of setting time for the cement, the maximum outside diameter of the drill
collar, maximum speed of the rotary table while drilling out the casing shoe, and other details. Also, the drilling contract should specify whether casing and cementing are to be performed on a footage or a daywork basis. The operator is generally allowed to modify the above specifications during the course of drilling. However, if the modification materially increases the drilling contractor's cost of performance, the operator must pay additional compensation or revert to a daywork basis.

I. Drilling Methods and Practices

Because the drilling of an oil and gas well is an expensive and hazardous endeavor requiring great expertise, a drilling contract should address the standard of performance expected of the drilling contractor. For example, the API drilling contract form requires the contractor to perform "with due diligence and care, in a good workmanlike manner, and in accordance with good drilling practices." In addition, the drilling contractor represents that it "is engaged in the business of drilling and completing such wells and represents that it has adequate equipment meeting specifications stated herein and in good working order and trained personnel capable of efficiently operating such equipment."

The IADC footage and daywork forms do not include a general standard of performance; however, a court might infer such a warranty.

In E.B. Duncan Drilling & Well Servicing Co. v. Robinson Research, Inc., the contractor agreed to drill a well with "due diligence and care and in a good and workmanlike manner" and specifically agreed to "maintain well control equipment in good condition at all times" and to "use all reasonable means to control and prevent fires and blowouts and to protect the hole." While drilling at a depth of 1,068 feet, circulation was lost. The driller then left the site to procure more mud and well control materials. While the driller was away from the site, a blowout occurred and the well caught fire. The well was brought...
under control with a "home-made" blowout preventer. In a suit by the drilling contractor for payment, the court held that the contractor had not conducted drilling operations in a good and workmanlike manner. The contractor unsuccessfully argued that it did not have to furnish any well control equipment or blowout preventers at the site because the drilling order did not specify any such equipment beyond a drilling rig. The court, however, noted that "this position is untenable since it is clear that the description of the rig was intended to include all necessary appurtenances thereto," including blowout preventers and well control equipment.

In W.E. Myers Drilling Corp. v. Elliott, the drilling contractor had agreed, under the terms of a daywork contract, to drill a well "with due diligence and care and in a good and workmanlike manner" on a daywork basis to 3,200 feet at a daywork rate of $5,250. The parties estimated that the price would be $65,000, which sum was paid in advance in accordance with the contract, with a proviso for additional payments or a refund as might be due upon completion of the well. Drilling took longer than estimated, and the drilling contractor sued the operator for additional sums due. The operator conceded that the well had been drilled in a "good and workmanlike manner," but contended that the contractor had not drilled with "due diligence," as required by the contract. The jury found for the operator, concluding that a duly diligent contractor would have completed the well in ten days; in this case, the contractor had taken twelve and one-half days. Relying on precedent, the appellate court noted that the contractor carries the

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303. Id.
304. Id. at 99.
305. Id. at 98.
306. Id. at 98.
307. Id. at 98. An interesting aside in this case is that the contractor took the testimony of an inspector for the oil and gas conservation agency. He testified that existing orders required blowout preventers at well sites and that his workload prevented him from uncovering every violation. However, he refused to concede that wells were customarily drilled in the field without blowout preventers. Id.
308. 695 S.W.2d 809 (Tex. App.—El Paso 1985, writ ref’d n.r.e.).
309. Id. at 810.
310. Id.
311. Id.
312. Id.
313. Id.
burden of proving due diligence in a *daywork* contract.\textsuperscript{315} In affirming the trial court, the appellate court noted:

Although the work was fully performed, the contract was not substantially performed when the jury failed to find that the contractor complied with the due diligence clause . . . . But since the work was completed, the contractor was entitled to recover for the number of days reasonable and necessary to complete the well.\textsuperscript{316}

The court cautioned that a "'due diligence' clause may not make time of the essence," thereby allowing the operator to rescind; however, the clause does excuse the operator from paying for "excessive delays."\textsuperscript{317}

In reaching this result, the court refused to follow what it perceived to be the reasoning of *Matador Drilling Co. v. Post*.\textsuperscript{318} The *Elliott* court rejected the notion "that a daywork contract can be substantially performed without regard to compliance with the 'due diligence' clause."\textsuperscript{319} In *Matador*, drill pipe lodged in the hole, and in an effort to free the pipe, the derrick was damaged.\textsuperscript{320} Repairs to the derrick caused substantial delay in drilling, but the court concluded that the drilling contractor had substantially performed the contract.\textsuperscript{321}

In dicta, the *Elliott* court distinguished the "due diligence" clause from the "good and workmanlike manner" clause:

In the *Matador Drilling Company* case, had the well been completed within the anticipated thirty days but with such a directional deviation that casing could not be run, certainly the court would not have found "substantial performance." When the parties contracted for both "due diligence" and "good and workmanlike manner" they must have expected both standards would be met in order for there to be substantial performance under the contract. Each clause is of equal dignity and each relates to a particular way the work was to be performed. Each clause is an essential part of the contract and each clause provides a defense to a claim of substantial performance . . . .

To protect against an excessive claim where the work was fully performed, the operator had required not only work in a good and workmanlike manner, which went to how the contract was completed, but also "due diligence," which went to when the contract was completed. Otherwise, an operator would have no protection under a daywork contract where no diligence was exercised and the contractor

\begin{footnotes}
\item[315] *Elliott*, 695 S.W.2d at 811.
\item[316] *Id*. at 812.
\item[317] *Id*. at 811.
\item[318] 662 F.2d 1190 (5th Cir. 1981).
\item[319] *Elliott*, 695 S.W.2d at 811.
\item[320] *Matador*, 662 F.2d at 1193.
\item[321] *Id*. at 1197.
\end{footnotes}
chose to let the work go on and on and on.\textsuperscript{322}

In \textit{Matador}, drilling was delayed twenty-five days while the derrick was being repaired.\textsuperscript{323} In addition, fishing operations were conducted for thirteen days in an attempt to retrieve the stuck drill pipe.\textsuperscript{324} During the fishing operations, a survey revealed a substantial (twenty-one-degree) vertical deviation.\textsuperscript{325} This resulted in a three-day shutdown while the parties discussed the proper course of action.\textsuperscript{326} The drilling contractor, Matador, sued the operator, Post, seeking daywork compensation at operating rates, force majeure rates, or standby rates for specified periods during the delay, as well as for periods following the delay, and for equipment lost in the hole.\textsuperscript{327} The jury concluded that the drilling contractor had substantially performed the contract and, as a result, the jury made no reduction in the award for the operator’s counterclaim.\textsuperscript{328}

On appeal, the court concluded that the drilling contractor had met its burden of proving substantial performance\textsuperscript{329} by introducing into evidence the contract, testimony about the work performed, and final invoices that had been submitted to the operator.\textsuperscript{330} The court stated that the test for meeting the burden of proof was whether the evidence submitted was sufficient to withstand a motion for a directed verdict and held that the motion was properly denied by the trial judge.\textsuperscript{331} The court did, however, deny the payment of force majeure rates for the period that the rig was being repaired.\textsuperscript{332}

\textit{Matador} appears to be a case where the jury and court were satisfied that the contractor had conducted operations in a good and workmanlike manner and that the delays were beyond the contractor’s control. In other words, considering the problems that caused the delays, the contractor did act diligently. Arguably, therefore, \textit{Matador} and \textit{Elliott} are distinguishable, and the court in \textit{Elliott} perhaps erroneously characterized the holding in \textit{Matador} as finding substantial performance without regard to compliance with the “due diligence” clause.\textsuperscript{333}

\textsuperscript{322} \textit{Elliott}, 695 S.W.2d at 811-12.
\textsuperscript{323} \textit{Matador}, 662 F.2d at 1193.
\textsuperscript{324} \textit{Id}.
\textsuperscript{325} \textit{Id}.
\textsuperscript{326} \textit{Id}.
\textsuperscript{327} \textit{Id} at 1194.
\textsuperscript{328} \textit{Id} at 1197.
\textsuperscript{329} \textit{Id}.
\textsuperscript{330} \textit{Id} at 1196. The operator had introduced into evidence a list of “excess” costs. \textit{Id} at 1195.
\textsuperscript{331} \textit{Id} at 1196-97.
\textsuperscript{332} \textit{Id} at 1197-98. \textit{See infra} subsection III(P).
\textsuperscript{333} \textit{Elliott}, 695 S.W.2d at 811.
A questionable aspect of Matador is the court’s reluctance to require more specific evidence as to the parties’ failure to discover a twenty-one-degree deviation in 5,200 feet of hole. While geologic conditions might explain the deviation, such conditions do not explain why the operator’s deviation tests did not indicate such a substantial deviation. In other words, were the deviation surveys conducted in a “good and workmanlike manner”? And which party bears the risk of such a deviation? Note that the API form specifically provides: “While operations are being performed on a daywork basis, Contractor agrees to exercise due diligence and care to maintain the straight hole specifications,... but all risk and expense of maintaining such specifications or restoring the hole . . . shall be assumed by Operator.”

The Matador opinion does not state whether the contract was executed on a model form. Perhaps the court tried to achieve “rough justice” by denying force majeure rates for twenty-four days of delay. However, note that daywork drilling is conducted under the operator’s direction and control.

In Houy v. Davis Oil Co., the court held that a contractor had completed two wells in a good and workmanlike manner even though the contractor had caused third-party liens to be filed against the operator’s property due to the contractor’s failure to pay for supplies furnished by the third parties. This holding was reached even though the contract specified that the contractor was obligated to furnish the supplies in question and had promised to drill a lien-free well.

The “good and workmanlike manner” clause can also lead to litigation over whether the clause constitutes an indemnity against the operator’s negligence. Some driller-oriented forms may specifically negate a “good and workmanlike manner” warranty and limit the contract to specific warranties expressed in the contract. While a specific disclaimer may diminish the standard in some circumstances, it would not allow the drilling contractor to act in bad faith. For example, when a drilling contractor is found to have engaged in misleading or fraudulent conduct, such as representing that the well has been drilled to the contract depth...

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334. Appendix B, Article 8.5. The IADC daywork form does not contain this clause.
335. 662 F.2d at 1198.
336. See Appendix B, Article 3.2.
338. Id. at 185, 486 P.2d at 21.
339. Id. at 183, 486 P.2d at 20.
340. See infra note 461 for a discussion of Exxon Corp. v. Roberts, 724 S.W.2d 863 (Tex. App.—Texarkana 1986, writ ref’d n.r.e.).
341. As this Article was being written, the forms committee of the International Association of Drilling Contractors was considering such a change in its forms.
when the contractor knew this was false, a court may allow the operator
to rescind the contract without payment of any portion of the price,
whether or not the contract required drilling in a good and workmanlike
manner.\textsuperscript{342}

In addition, the drilling contractor must “maintain well control
equipment in good operating condition . . . and . . . use all reasonable
means to control and prevent fires and blowouts, protect the hole, and
protect Operator’s equipment.”\textsuperscript{343} While the current onshore model
forms do not do so, a drilling contractor would be wise to make its liability
under this provision specifically subject to the liability limits ex-
pressed in the contract. Otherwise, a contractor’s negligent failure to
maintain bottom hole pressure may subject the contractor to well control
and pollution expenses for which the contractor may not be insured.\textsuperscript{344}

Generally, state oil and gas conservation regulations specify the
equipment and drilling practices required for safety and the prevention of
blowouts, fires, and pollution. Because of these regulations, the determi-
nation of whether a drilling contractor has been “reasonable” in provid-
ing and maintaining the equipment necessary to ensure safety and to
control and prevent blowouts and fires may be relatively easy. However,
the determination of whether a contractor has acted reasonably in con-
trolling a fire or in controlling a “kick” that could result in a blowout is
very difficult. For example, if abnormal pressures are encountered, the
contractor may walk a fine line in deciding whether to try immediately to
tighten the well or to abandon the well to protect the lives of the crew.

While a footage or daywork contract customarily requires the oper-
ator to specify the drilling mud program,\textsuperscript{345} the drilling contractor is ob-
ligated to maintain the drilling mud program in accordance with the
operator’s specifications.\textsuperscript{346} Moreover, in the event abnormal pressures
are encountered, the drilling contractor must “without undue delay, ex-
ert every reasonable effort to overcome such difficulty.”\textsuperscript{347}

1954). This case concerned an agreement whereby the non-operator was to contribute a portion
of the costs of drilling a well. The court allowed the non-operator to rescind and to recover contribu-
tions paid when the operator was found to have misrepresented the work that had been done on the
well.

\textsuperscript{343} Appendix B, Article 8.2. See also Appendix A, Article 16.

\textsuperscript{344} See, e.g., International Association of Drilling Contractors, Domestic Daywork Drilling
Contract—Offshore, Section 509 (Feb. 1988).

\textsuperscript{345} See, e.g., Appendix A, Articles 5.6 and 8.

\textsuperscript{346} See, e.g., Appendix B, Article 8.3.

\textsuperscript{347} Appendix A, Article 16.2.
The drilling contractor agrees to drill a straight hole, unless a directional well is specified, and also agrees to make all deviation surveys specified in the contract.\textsuperscript{348} Under a footage contract, the drilling contractor generally bears the risk of excessive deviation. However, under a typical daywork contract, the risk of a deviated hole is generally borne by the operator because the operator has more control over drilling operations.\textsuperscript{349}

J. Reports

1. Drilling Reports

Most drilling contracts require the contractor to furnish the operator with daily or more frequent drilling reports summarizing the current status of the well, including the current depth of the hole and the formations penetrated.\textsuperscript{350} Often, the drilling contract requires telephone reports to the operator when certain depths or geological horizons are encountered. These reports are most commonly made on the API-IADC Daily Drilling Report Form, a form jointly drafted under the sponsorship of the American Petroleum Institute and the International Association of Drilling Contractors. The report is prepared by the driller or toolpusher and is submitted daily to the operator.\textsuperscript{351}

In \textit{Matador Drilling Co. v. Post},\textsuperscript{352} the court permitted the admission of such reports into evidence, over the objection of the operator who asserted that they were self-serving, to determine whether the contractor had acted with due diligence and performed work in a good and workmanlike manner.\textsuperscript{353} In the event that a controversial decision must be made, the drilling contractor may seek the concurrence of the operator's representative at the well site. Such concurrence can be indicated by having the representative sign the drilling report form.

In addition, the drilling contractor is generally responsible for monitoring the deliveries of equipment and supplies to the well site by the operator or a vendor of the operator. The drilling contractor is to verify

\textsuperscript{348} See, e.g., Appendix B, Article 8.5; Appendix A, Article 9.
\textsuperscript{349} See, e.g., Appendix B, Article 8.5.
\textsuperscript{350} See, e.g., Appendix B, Article 10.1.
\textsuperscript{351} For a brief discussion of the respective duties of the driller, toolpusher, and other members of the drilling crew, see Appendix F. In \textit{Samson Resources Co. v. Quarles Drilling Co.}, 783 P.2d 974, 977 (Okla. Ct. App. 1989), the court suggested that the requirement of daily drilling reports may, if consistent with industry custom and usage, require the drilling contractor to notify the operator of any circumstances that would result in a change from a "footage" to a "daywork" basis.
\textsuperscript{352} 662 F.2d 1190 (5th Cir. 1981).
\textsuperscript{353} \textit{Id.} at 1198-99.
the quantities, description, and condition of such supplies and equipment and submit delivery tickets for such items along with the daily drilling report.\textsuperscript{354} Many operator-oriented contracts make the drilling contractor responsible for loss or damage resulting from a failure to detect defects in the operator's equipment.

2. Accident Reports

Because of the proliferation of tort claims and rising insurance rates, drilling accidents are a major concern to both the operator and the drilling contractor.\textsuperscript{355} In the event an accident occurs involving personal injury or equipment damage, the drilling contractor must report such accidents to the operator, often by telephone with a follow-up written report, as soon as practicable. Such reports must include the nature of the accident, injuries, and damages, and generally must include copies of any reports filed with insurers, government officials, or other parties.\textsuperscript{356} The language of the model forms is very broad and may arguably include reports to counsel and corporate officials which the drilling contractor may not wish to share. Accordingly, some drilling contractors may negotiate a more specific provision requiring only that copies of insurance or workers' compensation claim forms be submitted to the operator.

K. Insurance Requirements

1. Introduction

By its very nature, the oil and gas well drilling business exposes operators and drilling contractors alike to innumerable risks as unexpected problems arise when new formations in unexplored regions are tested. A drilling contract contains extensive provisions covering liabilities, indemnification, and insurance to guard against the potentially enormous costs and losses which may be incurred. These clauses attempt to allocate responsibility and liability for accidents which may cause property damage or loss, personal injury, or death. However, a major source of drilling contract litigation concerns disputes over which party assumed responsibility for certain risks under the terms of a drilling contract.\textsuperscript{357} Therefore, when allocating risks in a drilling contract, the parties should

\textsuperscript{354} See, e.g., Appendix B, Article 10.3.
\textsuperscript{355} See infra discussion at subsections III(K) and (L).
\textsuperscript{356} See, e.g., Appendix B, Article 10.2.
\textsuperscript{357} See generally Calkins, The Drilling Contract, supra note 71, at 285.
attempt to clarify to the greatest extent possible exactly "who" is responsible for "what," so that the likelihood of future litigation is avoided and legal and insurance expenses are minimized. Indeed, risk allocation is the most crucial issue in drilling contract negotiations.

2. Types of Insurance

Although drilling contractors maintain insurance coverage for their own operations, the majority of drilling contracts require the drilling contractor to procure and maintain adequate insurance covering the contractor's operations for the duration of the drilling contract. The API drilling contract form specifies minimum limits of coverage for each type of insurance required of the drilling contractor and provides blanks for the insertion of additional or alternate coverage. Additionally, the parties must ensure that the minimum amounts are in compliance with all applicable state and federal laws and regulations. While insurance is generally carried at the drilling contractor's expense, the cost of the coverage may be reflected in the compensation paid the contractor for the drilling of the well.

A drilling contract generally requires the drilling contractor to carry three or more categories of insurance coverage. The first type of insurance is employee or personnel, including workers' compensation coverage which the drilling contractor must ordinarily obtain "in full compliance with all applicable state and Federal laws and regulations." In addition to workers' compensation insurance, most drilling contracts, including the API form, require the drilling contractor to provide employers' liability insurance covering an employee's injury or death resulting from a mishap which may be outside the scope of the applicable workers' compensation statute. Finally, some drilling contracts require the contractor to provide unemployment compensation insurance if mandated by statute.

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358. See, e.g., Appendix B, Article 11. See also Appendix C, Article 13; Appendix D, Article 16; Appendix E, Article 15.
359. See, e.g., Appendix B, Article 11.1. In the API form, any inserted amounts of coverage prevail over the pre-printed figures. In practice, many drilling contractors attach certificates of insurance coverage to the contract in lieu of completing this portion of the contract form.
360. See, e.g., Appendix B, Article 11.1(a)-(d).
362. See Appendix B, Article 11.1(b).
Automobile liability insurance is the second category of insurance coverage. This insurance covers liability to any person, either due to bodily injury or destruction of property, arising from all “owned, non-owned, and hired automobile equipment” used in connection with the work performed under the contract. While minimum policy limits are normally provided under the drilling contract, insurance coverage must comply with applicable state law. For example, in each state where operations occur, the coverage limits must meet the minimum statutory requirements for no-fault, uninsured or underinsured motorist, and minimum liability coverages.

The third general category of required insurance coverage is comprehensive general liability insurance. This coverage is probably the most important since it covers the greatest potential exposure to liability. Comprehensive general liability insurance coverage protects: the operator from claims by employees of the drilling contractor; the drilling contractor from claims made by employees of the operator; and both parties from claims made by employees of third-party contractors, by trespassers, and by invitees. In addition to insuring against personal injury, this policy also insures against property damage. A well-drafted drilling contract, including the API form, requires the drilling contractor to obtain comprehensive liability insurance “covering all operations” of the contractor, including any contractual liability assumed by the contractor. Most drilling contracts specify the minimum limits which must be provided “per occurrence.”

A fourth category of insurance coverage which some operators may require is property insurance. This coverage extends to physical damage to the drilling contractor’s or the operator’s property, including the drilling rig, housing, offices, storage facilities, and other related equipment utilized in the performance of the drilling contract. While prudent drilling contractors would carry property damage coverage on their rigs, some operators require proof of such coverage.

364. Appendix B, Article 11.1(d).
365. See Battato & Gilbertson, supra note 363, at 17-20.
366. See Battato & Gilbertson, supra note 363, at 17-21.
367. See Battato & Gilbertson, supra note 363, at 17-21.
368. See generally Battato & Gilbertson, supra note 363, at 17-22.
369. See Appendix B, Article 11.1(c).
370. A drilling contractor must be careful when negotiating a contract not to assume risks not covered by its existing blanket comprehensive liability policy.
371. See, e.g., Appendix B, Article 11.
372. See, e.g., Appendix B, Article 11.1(c).
To ensure compliance with the insurance provisions, the drilling contract often requires the drilling contractor to furnish the operator with certifications that all insurance is in full force and effect.\textsuperscript{373} Also, the operator may reserve final approval over which company or companies may underwrite the drilling contractor’s insurance coverage.\textsuperscript{374} A well-drafted drilling contract also provides that the insurance may not be cancelled or materially changed without prior written notice to the operator.\textsuperscript{375} Strict adherence to these provisions is critical to ensure that the necessary insurance coverage is in force at all times during the performance of the drilling contract.

In contrast, drilling contracts seldom require the operator to have insurance coverage, yet the operator assumes substantial risks and generally may agree to indemnify the contractor for stated risks. The model forms, however, do provide that the operator must have its insurer waive subrogation rights against the contractor for risks that the operator assumes.

In addition to ascertaining that the drilling contractor has the required categories of insurance coverage, the operator should examine all policies to determine whether each policy is an “occurrence” policy or a “claims made” policy. The “occurrence” policy is the type of liability policy that traditionally has been marketed by the majority of insurance companies. Under an “occurrence” policy, coverage is extended for any property damage or bodily injury which “occurs” during the period the policy is in force, even if a claim for that damage or injury is not filed for years after the policy expires. In other words, the \textit{time of the occurrence} of the damage or injury determines whether there is coverage. This type of policy is purchased by most service industries, including drilling contractors.

Under a “claims made” policy, the occurrence of the property damage or bodily injury does not determine or trigger the coverage; rather, the \textit{time of the filing of the claim} against the insured determines whether there is coverage. Thus, a “claims made” policy differs from an “occurrence” policy in that, under a “claims made” policy, property damage or bodily injury claims must be brought and reported to the insurer within the term of coverage specified in the policy.\textsuperscript{376} The “claims made” policy

\textsuperscript{373} See, e.g., Appendix B, Article 11.1(g).
\textsuperscript{374} Id.
\textsuperscript{375} Id.
\textsuperscript{376} For a more comprehensive article dealing with insurance policies as they relate to drilling contracts, see generally Battiato & Gilbertson, \textit{supra} note 363, at 17-1.
has not been well received by service industries. Accordingly, an "occurrence" policy is the standard form used in the well drilling industry.\(^{377}\)

By requiring the drilling contractor to obtain an "occurrence" policy, the operator will be insured against covered mishaps occurring within the duration of the contract.\(^{378}\) Note that while the model forms specify liability coverage "per occurrence,"\(^{379}\) this language is intended to refer to the amount of coverage required for each accident, and not to an "occurrence" policy. Failure to secure adequate insurance coverage could expose the operator (and contractor) to a high risk of liability for damages, particularly in the case of a drilling contractor (or operator) that is judgment proof.

In addition to the form of policy, both operators and drilling contractors must be careful to secure coverage that will meet their expectations. An illustrative case is *Natol Petroleum Corp. v. Aetna Insurance Co.*\(^{380}\) By the terms of a drilling contract, the operator assumed the risk of loss to the contractor's in-hole equipment while on a daywork basis—a common provision in most drilling contracts. While drilling on a daywork basis, well control was lost and efforts to restore control were unsuccessful.\(^{381}\) Consequently, the well had to be plugged, and the contractor's drill pipe and other equipment were cemented in the hole.\(^{382}\) The operator filed a claim with its liability insurer, Aetna, for the value of the lost equipment.\(^{383}\) Aetna denied the claim, contending that the policy did not include coverage for liability assumed by contract, but only covered liability "imposed by law."\(^{384}\) The parties stipulated that the loss of the contractor's drilling equipment was not caused by the negligence or other tortious conduct of the operator and that the operator's liability was assumed under the contract.\(^{385}\) In construing the insurance

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\(^{377}\) The "claims made" policy is more commonly used in the manufacturing industry. Most insurance companies and underwriters prefer the "claims made" policy because of the advantage of predictability. Under an "occurrence policy," underwriters have problems predicting incurred but unreported losses which might not result in claims until years later. In contrast, under a "claims made" policy, the period of time for which claims are covered is limited, thereby enabling underwriters more accurately to predict potential losses. *See* Battista & Gilbertson, *supra* note 363, at 17-23.

\(^{378}\) Alternatively, the operator could require the drilling contractor to maintain the requisite coverage under a "claims made" policy for the period of time necessary to exceed any governing statutes of limitations. However, this would necessitate follow-up certifications of coverage.

\(^{379}\) *See* e.g., Appendix B, Article 11.1(b)-(d).

\(^{380}\) 466 F.2d 38 (10th Cir. 1972).

\(^{381}\) *Id.* at 39.

\(^{382}\) *Id.* at 40.

\(^{383}\) *Id.*

\(^{384}\) *Id.*

\(^{385}\) *Id.*

\(^{386}\) *Id.*
contract, the trial court granted the operator's motion for summary judgment and Aetna appealed. The Tenth Circuit reversed, holding that the insurance contract did not cover liability assumed by contract. In other words, liability assumed under the terms of a contract and enforceable according to contract law is different from liability "imposed by law," such as tort law, in the absence of a contract. Thus, both operators and contractors must make certain that their liability policies are as comprehensive as their needs require, as they will self-insure for any noncovered risks.

Due in large part to the rising cost of obtaining conventional insurance coverage through carriers, many large drilling contractors choose to self-insure their operators by setting aside a fund sufficient to meet potential losses. Large drilling contractors often self-insure up to a specified amount and then cover any excess with insurance. In the event of a loss, the drilling contractor must pay any claims up to the self-insured limits, with the insurance company paying the balance. The API drilling contract allows the contractor to act as a self-insurer as to any one or more of the risks for which insurance coverage is required, subject to the written approval of the operator. Before granting approval to act as a self-insurer, the operator should verify that the drilling contractor has sufficient resources available to satisfy any claims for which the contractor has assumed liability which could potentially arise in the course of performing the drilling contract.

L. Risk Allocation and Indemnification

1. Public Policy
   a. Introduction

Through the inclusion of indemnity provisions, the operator and drilling contractor allocate the risks of losses and damages between

387. Id. at 38.
388. Id. at 42.
389. See generally Battista & Gilbertson, supra note 363, at 17-1.
390. See Appendix B, Article 11.2.
391. Of course, this same admonition applies to the drilling contractor where the operator self-insures. However, as indicated above, most drilling contracts do not require the operator to have any insurance, notwithstanding the substantial risks that an operator assumes.
themselves. Commonly referred to as "hold harmless" clauses, indemnity provisions are normally inserted in drilling contracts.

Historically, courts have held indemnity agreements void as against public policy on the grounds that such provisions encouraged negligence on the part of the indemnitee. This reasoning has been largely discarded. Today such agreements are generally enforced where the agreement to indemnify against negligence is clearly expressed. However, several oil and gas producing states have enacted statutes prohibiting certain types of indemnity provisions in drilling contracts. These anti-indemnity statutes generally hold indemnity provisions void if they purport to indemnify the indemnitee against bodily injury, death, or property damage arising from the negligence of the indemnitee.

b. The Wyoming Statute

The Wyoming Legislature first enacted a statute voiding certain indemnity clauses in 1969. In its current form, the Act prohibits any agreement "pertaining to any well for oil, gas or water, or mine for any mineral" which indemnifies against loss or liability for death, injury, or property damage arising from the negligence of the indemnitee, its agents, employees, or independent contractors "directly responsible" to the indemnitee. An owner of the surface estate, however, may secure an indemnity from a lessee, operator, or contractor. Also, an indemnification is not prohibited where the indemnitee is not seeking an indemnification against its own negligence.

392. For a comprehensive and thorough discussion of indemnity law with respect to offshore well drilling, see Tade, Drafting Texas and Louisiana Indemnity Provisions for Use in Offshore Oil and Gas Contracts: Case Law Analysis and Application to Offshore Contracts (ABA Monograph Series 1989).

393. See, e.g., Appendix B, Articles 11.2-11.8. See also Appendix C, Article 14; Appendix D, Article 18; Appendix E, Articles 17.12-17.13.

394. See also ALASKA STAT. § 45.45.900 (1986) for an anti-indemnity statute that applies to "construction" contracts, as well as drilling contracts. Of course, these anti-indemnity statutes do not prohibit liability insurance.


397. Id. § 30-1-131(a).

398. Id. § 30-1-131(a)(iii)(A).

399. Id. See also Emerson, 578 P.2d 1351 (Wyo. 1978).


401. Emerson, 578 P.2d 1351 (Wyo. 1978). Indemnity clauses have been held valid under other
c. The New Mexico Statute

The New Mexico statute,\textsuperscript{402} enacted in 1971,\textsuperscript{403} is nearly identical to the Wyoming Act. In construing the Act, the New Mexico Court of Appeals has noted that the purpose of such statutes is to promote safety by prohibiting mine operators from delegating the duty to conduct safe operations to subcontractors.\textsuperscript{404} Like the Wyoming Act, the New Mexico Act has been construed to prohibit indemnities only against the indemnitee's own negligence. However, when the parties to the contract are concurrently negligent, the indemnity is valid to the extent of the indemnitor's negligence.\textsuperscript{405} Also, like the Wyoming Act, the New Mexico Act provides that the Act shall not affect the validity of any insurance contract.\textsuperscript{406} The New Mexico Supreme Court has held that this provision refers only to the indemnitor obtaining insurance coverage for itself. The indemnitee may not avoid the Act by requiring the indemnitor to secure insurance for and on behalf of the indemnitee.\textsuperscript{407} This decision rejects a contrary construction given the Act by federal courts.\textsuperscript{408}

d. The Louisiana Statute

The Louisiana Oil Field Indemnity Act,\textsuperscript{409} enacted in 1981,\textsuperscript{410} is
similar to the Wyoming and New Mexico Acts. However, it prohibits indemnities only for loss or liability arising from death or bodily injury which was caused by the negligence of the indemnitee, whereas the Wyoming and New Mexico Acts also prohibit indemnities against injury to property. Also, in addition to allowing surface owners to secure indemnities from operators, mineral lessors and parties to farmout or operating agreements who do not “physically perform any activities” pertaining to such agreements may also secure an indemnity from the operator. In addition, the Act does not prohibit indemnities arising from injury resulting from (1) radioactivity, (2) retention of oil spills, (3) clean-up and removal of structural waste from a wild well, (4) failure of incidental piping, valves, and separators between the well head and pipelines, (5) failure of pipelines, (6) performance of services to control a wild well, and (7) work performed under contracts executed before the Act’s effective date which provide for “specific terminable performance.”

Thus, while the Act addresses only death and bodily injury and carves out more exceptions to the general prohibition against indemnities, the Act specifically nullifies “waivers of subrogation, additional named insured endorsements, or any other form of insurance protection which would frustrate or circumvent the prohibitions” of the Act.


See supra subsections III(L)(b), (c).

See supra subsections III(L)(b), (c).


Id. § 9:2780(D)(2).

Id. § 9:2780(D)(3).

Id. § 9:2780(D)(4).


LA. REV. STAT. ANN. § 9:2780(F).

The Louisiana Act has been the subject of much litigation.\textsuperscript{420} Efforts to avoid the Act have proven largely unsuccessful.\textsuperscript{421} In addition, although the Act is not generally retroactive, it does govern pre-Act contracts that do not provide for a specific terminable performance, as well as pre-Act master contracts which are supplemented by separate post-Act contracts each time a specific service is provided.\textsuperscript{422} Finally, while the provisions of a contract may require that a party maintain insurance against its own acts of negligence, the contract may not require one party to name the other as an additional insured under the contract, thereby obtaining protection from such party’s insurer that could not lawfully be obtained directly from such party.\textsuperscript{423}

An illustrative case construing the Louisiana Act is \textit{Davis v. Mobil Oil Exploration and Producing Southeast, Inc.}\textsuperscript{424} Davis, an employee of Dual Drilling Company, the drilling contractor, was injured due to the alleged negligence of Dual and of Mobil, the operator.\textsuperscript{425} Davis contended that a Mobil representative had ordered Dual’s employees not to wash the drill floor as frequently as safe operations would dictate because of Mobil’s desire to conserve water.\textsuperscript{426} Mobil argued that Dual, as an independent contractor, was solely liable for Davis’s injuries,\textsuperscript{427} and, in any event, that Dual had agreed to indemnify Mobil from such claims.\textsuperscript{428} After the jury ruled in favor of Davis, the trial court dismissed Mobil’s

\textsuperscript{420} In addition to the cases cited above and below, see annotations to LA. REV. STAT. ANN. § 9:2780 (West 1981 & Supp. 1989).
\textsuperscript{421} See supra note 409 for cases challenging constitutionality. See also Matte v. Zapata Offshore Co., 784 F.2d 628 (5th Cir.), cert. denied, 479 U.S. 872 (1986), wherein the court held that a contract specifying federal law as governing the contract in question violated public policy and thus did not avoid the Louisiana Act. In addition, Louisiana courts have previously refused to enforce the laws of other states which are repugnant to its own laws. See, e.g., Smith v. Globe Indem. Co., 243 So. 2d 882 (La. Ct. App. 1971). The Louisiana Supreme Court has refused to follow governing law clauses where the designated state has no interest in the litigation under traditional conflicts standards. See Jagers v. Royal Indem. Co., 276 So. 2d 309 (La. 1973). In Patterson v. Conoco, Inc., 670 F. Supp. 182, 183-84 (W.D. La. 1987), the court invalidated an indemnity clause under the Louisiana Act, where the parties had agreed that the laws of Delaware were to govern the contract.
\textsuperscript{423} Babineaux v. McBroom Rig Bldg. Serv., 806 F.2d 1282 (5th Cir. 1986), \textit{held in abeyance}, 811 F.2d 852 (5th Cir. 1987), \textit{mandate} 817 F.2d 1126 (5th Cir. 1986). But see Patterson v. Conoco, Inc., 670 F. Supp. 182, 184 (W.D. La. 1987), wherein the court allowed the operator to be a named co-insured on the contractor’s policy where the operator had actually paid the insurance premium.
\textsuperscript{424} 864 F.2d 1171 (5th Cir. 1989).
\textsuperscript{425} Id. at 1173.
\textsuperscript{426} Id.
\textsuperscript{427} Id. at 1175.
\textsuperscript{428} Id. at 1176.
cross-claim against Dual.\textsuperscript{429} On appeal, the Court of Appeals for the Fifth Circuit held (1) that since Mobil, the principal, had expressly authorized an unsafe drilling practice, Mobil was liable for the actions of its independent contractor, Dual,\textsuperscript{430} and (2) that, under the Louisiana Oil Field Indemnity Act,\textsuperscript{431} "a contractual agreement requiring insurance to be provided by an indemnitor (Dual) to an indemnitee (Mobil) for losses caused by the negligence of the indemnitee is ordinarily . . . null and void."\textsuperscript{432} Mobil had argued that Louisiana law allowed such an indemnification where the indemnitee paid for the indemnitor's insurance premium.\textsuperscript{433} While this argument had merit, the court ruled that it was untimely.\textsuperscript{434}

e. The Texas Statute

The Texas Act,\textsuperscript{435} initially enacted in 1973, was substantially amended in 1989.\textsuperscript{436} The Act nullifies "an agreement pertaining to a well for oil, gas, or water or to a mine for a mineral"\textsuperscript{437} which indemnifies against loss or liability resulting from personal injury, death, or property damage and caused by the negligence of the indemnitee.\textsuperscript{438} However, the Act does not apply to an indemnification against (1) personal injury, death, or property damage resulting from radioactivity, (2) property damage resulting from pollution (including cleanup and control) or from reservoir or underground damage (including loss of oil, gas, other mineral, water, or the well bore), or (3) personal injury, death, or property damage resulting from the performance of services to control a wild well, including well-control costs.\textsuperscript{439} Also, the Act does not affect the validity

\begin{thebibliography}{99}
\bibitem{429} Id. at 1173.
\bibitem{430} Id. at 1175.
\bibitem{432} \textit{Mobil}, 864 F.2d at 1176 (citation Babineaux v. McBroom Rig Bldg. Serv., 806 F.2d 1282 (5th Cir. 1987)).
\bibitem{433} \textit{Mobil}, 864 F.2d at 1176 (citation Patterson v. Conoco, Inc., 670 F. Supp. 183 (W.D. La. 1987)).
\end{thebibliography}
of an insurance contract, a benefit conferred by workers' compensation, or an indemnity given a surface owner by a mineral lessee, operator, or contractor conducting exploration or production operations on the surface.

Prior to the effective date of the 1989 amendments (September 1, 1989) the Act also excepted an agreement to indemnify against claims of the indemnitee's employees and agents and of the employees and agents of the indemnitor's subcontractors, provided that the parties agree that the indemnification "will be supported by available liability insurance coverage to be furnished by the indemnitor." The indemnification was limited by the extent and amount of coverage the indemnitor agreed to furnish. However, "[t]he amount of insurance required may not exceed 12 times the state's basic limits for personal injury [$300,000], as approved by the State Board of Insurance." One court has recently construed a previous codification of this provision to mean that, while the contract may not require coverage in excess of that amount, the indemnitor can voluntarily choose to provide greater insurance coverage, and that in such a circumstance the indemnity is not limited to $300,000.

Moreover, this same court construed the Act as not requiring that the insurance actually be furnished, but only that the parties agree that insurance coverage be provided. In this case, the indemnitor self-insured up to the sum of one million dollars and carried insurance policies to insure against losses exceeding that amount. There is no apparent reason to believe that the 1989 amendments to the Act must be construed differently.

The 1989 amendments provide that the Act does not apply to an indemnification supported by liability insurance to be furnished by the

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441. Id. § 127.007.
442. Id. § 127.005(a).
443. Id. § 127.005(c).
444. TEX. REV. CIV. STAT. ANN. art. 2212b(4)(c) (Vernon 1979) (repealed 1985). That provision read that "in no event shall said insurance be required in an amount in excess of twelve times State basic limits for bodily injury, approved by the Board of Insurance Commissioners." Id.
445. Maxus Exploration Co. v. Moran Bros., 773 S.W.2d 358, 361 (Tex. App.—Dallas 1989, writ denied). This holding should not be construed as permitting a party with greater bargaining power to compel the other party to "voluntarily" furnish more coverage than the Act permits, thereby undermining the policy behind the Act. In such a case, a court would undoubtedly limit the liability to the statutory maximum; however, a court could have great difficulty deciding whether a party was actually coerced in a given case.
446. Id. at 361 n.3.
447. Id.
Specifically, if the parties agree mutually to indemnify each other, the indemnification is valid "to the extent of the coverage and dollar limits of insurance or qualified self-insurance each party as indemnitee has agreed to provide in equal amounts to the other party as indemnitor." In other words, the parties are free mutually to indemnify each other up to any amount provided the indemnity meets the definition of a "mutual indemnity obligation." The definition is conjunctive and requires that the parties:

agree to indemnify each other and each other's contractors and their employees against loss, liability, or damages arising in connection with bodily injury, death, and damage to property of the respective employees, contractors or their employees, and invitees of each party arising out of or resulting from performance of the agreement.

The parties are apparently not free to provide for more limited mutual indemnitees than the Act allows, such as an indemnity against bodily injury but not against damage to property, or an indemnity against claims by each other's employees but not against claims by each other's contractors.

The amendments define "unilateral indemnity obligation" to mean:

an indemnity obligation . . . in which one of the parties as indemnitor agrees to indemnify the other party as indemnitee with respect to claims for personal injury or death to the indemnitor's employees or agents or to the employees or agents of the indemnitor's contractors but in which the indemnitee does not make a reciprocal indemnity to the indemnitor.

Although a unilateral indemnity is valid up to the amount of insurance, the amount of insurance (and hence the indemnification) may not exceed $500,000.

448. 1989 Tex. Sess. Law Serv. 1102, § 3 (Vernon).
449. Id. § 1(c).
450. The term "qualified self-insurance" is not defined. Without definition, the adjective "qualified" seems meaningless. One court has stated that self-insurance was permitted under the old act. See supra text and accompanying notes 445-47 for a discussion of Maxus Exploration Co. v. Moran Bros., 773 S.W.2d 358, 361 (Tex. App.—Dallas 1989, writ denied).
451. 1989 Tex. Sess. Law Serv. 1102, § 3(b) (Vernon).
453. The strict definition of "mutual indemnity obligation" appears to have been the result of a political tradeoff between operators and drilling contractors. In return for a strict definition of "mutual indemnity obligation," the drilling contractors agreed to support a raise in the limit for unilateral indemnifications from $300,000 to $500,000. Telephone Interview with Robert G. Croyle, Vice President, Rowan Companies, Inc. (1989). See "unilateral indemnity obligation," infra text and accompanying notes 454-69.
455. Id. § 3(c).
The amendments broadened the anti-indemnity scope of the Act by enlarging the definition of a "[w]ell or mine" service to include "purchasing, gathering, storing, or transporting oil, gas, brine water, fresh water, produced water, petroleum products, or other liquid commodities." Thus, the authorized indemnifications are limited to drilling and reworking contracts, well service, maintenance and testing contracts, and well completion contracts. One commentator has pointed out that the 1989 amendments authorizing indemnities do not specifically include "subcontractors." Presumably, however, the legislature did intend to include subcontractors within the scope of the authorized indemnification provisions. The Act specifically refers to contractors of the indemnitor. Accordingly, the context of this usage necessarily includes all contractors of the operator as indemnitor and all contractors of the drilling contractor as indemnitor—these latter parties are also "subcontractors" of the operator.

The 1989 amendments are specifically made retroactive. At least with respect to indemnities already governed by the prior Act, the retroactivity of the 1989 amendments probably do not unconstitutionally impair existing contracts since the amendments actually broaden freedom of contract. However, with respect to contracts not governed by the prior Act (e.g., purchase, gathering, transportation, and storage contracts), the retroactivity of the 1989 amendments may unconstitutionally impair such contracts.

There are several reported decisions construing the Texas Act. The most contested issue is whether a given indemnity provision is explicit enough to indemnify against the indemnitee's negligence. Historically, the test has been whether the provision expresses in "clear and

456. Id. § 1(3).
457. Id. § 3(a).
458. Tade, supra note 392, at 10.
461. In Exxon Corp. v. Roberts, 724 S.W.2d 863 (Tex. App.—Texarkana 1986, writ ref’d n.r.e.),
unequivocal” language the intent of the indemnitor to indemnify the indemnitee against the indemnitee’s negligence. However, in *Ethyl Corp. v. Daniel Construction Co.*, the Texas Supreme Court adopted a more stringent “express negligence” test, requiring the parties specifically to state their intent respecting indemnifications against an indemnitee's negligence within the four corners of the instrument. Since this decision, the Texas Supreme Court has ruled that an indemnity clause, which

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the court held that breach of a promise to case a well in a good and workmanlike manner did not entitle the operator to be indemnified against the claims of an injured third party. “To hold otherwise would effectively allow a covenant to perform in a good and workmanlike manner to be transformed into a contract of indemnity for negligent injuries to third parties.” *Id.* at 871. See also *Haring v. Bay Rock Corp.*, 773 S.W.2d 676, 680 (Tex. App.—San Antonio 1989, no writ) (quoting *Roberts*, 724 S.W.2d at 870-71.) A related issue is whether the indemnity language is sufficient to overcome the protection afforded an employer under workers' compensation law. See *Parker v. Enserch Corp.*, 776 S.W.2d 638, 649-50 (Tex. App.—Dallas 1989, writ granted).


464. *Id.* at 708. In *Ethyl*, the court concluded that the following indemnity provision was insufficient to indemnify against indemnitee's negligence: “Contractor shall indemnify and hold Owner harmless against any loss or damage to persons or property as a result of operations growing out of the performance of this contract and caused by the negligence or carelessness of Contractor, Contractor's employees, Subcontractors, and agents or licensees.” *Id.* at 707.

In applying the “express negligence” test, subsequent cases have held that the following indemnity provisions are insufficient to indemnify against the indemnitee's negligence:

- *Contractor... agrees to indemnify and save owner... harmless from any and all losses sustained by owner... from any liability or expense on account of property damage or personal injury... sustained or alleged to have been sustained by any person or persons,... arising out of... the performance or non-performance of work hereunder by contractor... or by any act or omission of contractor, its subcontractor(s), and their respective employees and agents while on owner's premises.*


- In *Singleton v. Crown Cent. Petroleum Corp.*, 713 S.W.2d 115, 117-18 (Tex. App.—Houston [1st Dist.] 1985) (emphasis in original), *rev'd* 729 S.W.2d 690 (Tex. 1987), wherein the above clause was insufficient as an indemnification against the indemnitee's *concurrent* negligence.

- [Operator] shall have no liability to owners of interests in said wells and leases for losses sustained, or liabilities incurred, except as such may result from gross negligence or from breach of the provisions of this agreement.


In *Continental Steel Co. v. H.A. Lott*, Inc., 772 S.W.2d 513 (Tex. App.—Dallas 1989, writ...
indemnifies against all liability arising from work performed “including but not limited to any negligent act or omission of” the indemnitee, meets the express negligence test. In addition, several courts have ruled that indemnity provisions, similar to those used in the model drilling contracts, meet the express negligence test by expressly providing for indemnity “without regard to . . . the negligence of any party.” An unreported decision, however, has concluded that such language is insufficient. If the model contract language is insufficient, one may ponder what language would be sufficient. Drafters of contracts should be sure to require no more than $500,000 of insurance from the indemnitor in the case of a unilateral indemnity, as contracts which require more than the statutory maximum are void. Presumably, this means that such contracts are not even valid up to the statutory limit. Also, in light of the 1989 amendments, drafters should consider reciting an equal amount of insurance to be furnished by both parties in the case of a mutual indemnity obligation; an argument could be made that the current model forms do not meet the requirements of the statute as amended.

468. To avoid this problem, the API form provides that if monetary limits of insurance or indemnity “exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.” Appendix B, Articles 11.3-11.4.
469. The model forms only require the drilling contractor to furnish specific amounts of insurance. See supra discussion at subsection III(K)(2). There is only a general reference to both parties agreeing to support their mutual indemnities with available liability insurance or self-insurance. See Appendix B, Articles 11.3 and 11.4; Appendix C, Articles 14.8 and 14.9; Appendix D, Articles 18.10 and 18.11; and Appendix E, Articles 17.12 and 17.13. In another provision, indemnities are expressed as being “without limit.” See Appendix B, Article 13.9; Appendix C, Article 14.13; Appendix D, Article 18.15; and Appendix E, Article 17.17. The 1989 amendments to the Texas Anti-Indemnity Act provide that a mutual indemnity obligation “is limited to the extent of the coverage and dollar limits of insurance or qualified self-insurance each party as indemnitor has agreed to
As should be apparent from this brief discussion of indemnity law, operators, drilling contractors, and third-party contractors must be keenly aware of the specific applicable law concerning indemnities, because their contractual indemnities, no matter how clear and unequivocal, will not be enforced to the extent that they violate the governing jurisdiction's public policy. In addition, these parties face the uncertainty of no precedent in some jurisdictions or the possibility that existing precedent will be overturned. Consequently, prudent operators, drilling contractors, and third-party contractors should insure against such fortuities, notwithstanding their contractual indemnification arrangements. While insurers may collect multiple premiums as a result of this uncertainty, insurance underwriters also have more difficulty assessing the risk to be assumed.

Fortunately, apart from statutory restrictions, the modern view enforces indemnity provisions that clearly and unequivocally assign the risks to be borne by each party. However, in the proper case, the court may strike down an exculpatory provision where the party in whose favor the clause operates enjoyed superior bargaining power. In addition, there have been many cases concerning the proper interpretation of an indemnity provision. The most persistent issue is whether a

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470. See, e.g., Reames Well Serv. v. El Paso Natural Gas Co., 418 F.2d 646 (5th Cir. 1969), wherein the court summarily upheld an indemnity provision in a well service contract. See also Associated Resources Corp. v. Halliburton Oil Well Cementing Co., 238 F.2d 957, 958 (8th Cir. 1956), cert. denied, 353 U.S. 912 (1957), wherein the court upheld an exculpatory provision in a well service contract, noting that the clause probably affected the price paid for the service. See generally Hancock, Some Pitfalls in Liability, Indemnification, and Insurance Clauses in Drilling and Service Contracts, 24 Rocky Mt. Min. Min. L. Inst. 585 (1978).

471. See, e.g., Mohawk Drilling Co. v. McCullough Tool Co., 271 F.2d 627 (10th Cir. 1959), wherein the court struck down an exculpatory provision which relieved a well service contractor from liability for its own negligence and also applied the doctrine of res ipsa loquitur to place the burden of disproving negligence on the contractor. See also ANR Prod. Co. v. Westburne Drilling, Inc., 581 F. Supp. 542 (D. Colo. 1984), wherein the court upheld an indemnity provision like those commonly found in model form drilling contracts. In dicta, however, the court did state that such a standardized printed clause would be “problematic” if the party challenging the clause was small and inexperienced as compared with the party seeking to enforce the clause. Id. at 547.
party's act or omission, or the damage or expense involved, was intended to be within the scope of the provision, especially in situations where the indemnitee's negligence has contributed to the problem.\footnote{472} In \textit{Wyoming Johnson, Inc. v. Stag Industries, Inc.},\footnote{473} Wyoming Johnson, the general contractor, and Stag, the subcontractor, agreed that Stag would indemnify Wyoming Johnson "'against ... all claims, suits or liability ... on account of any act or omission of Subcontractor.'"\footnote{474} The agreement also stated that Stag would "'be bound ... by the same terms, as the Contractor's [master] contract with the Owner and assume toward the Contractor all obligations and responsibilities which the Contractor by contract, assumes toward the Owner.'"\footnote{475} When Doyle, an employee of the subcontractor, was injured, Wyoming Johnson's insurer paid a personal injury settlement to Doyle.\footnote{476} Wyoming Johnson and its insurer then brought an indemnity action against Stag.\footnote{477}

The Wyoming Supreme Court held that the specific indemnity by Stag did not apply because the injury in question was not caused by an act or omission of Stag.\footnote{478} The court then focused on a clause in the master contract which provided that the "'Contractor ... shall indemnify and hold harmless the Owner ... from and against all claims, damages, losses and expenses ... .'"\footnote{479} The court further held that the attempted incorporation by reference of this "much broader" indemnity provision was not a "clear and unequivocal" undertaking by Stag to indemnify Wyoming Johnson for its negligence.\footnote{480} The court stated that where the indemnitee intends to transfer the risk of loss to the indemnitor for any shared fault, such intent must be expressed beyond any doubt, the test being "whether the contract language specifically focuses attention on the fact that by the agreement the indemnitor was assuming liability for indemnitee's own negligence."\footnote{481} Finally, the court held that when specific indemnity provisions are contained within a contract, no

\footnote{472} See Battiato & Gilbertson, \textit{supra} note 363, at 17-13 through 17-15. In addition to the case discussions which follow, see the Texas cases discussed in subsection III(L)(1)(e), \textit{supra}. \footnote{473} 662 P.2d 96 (Wyo. 1983). \footnote{474} \textit{Id.} at 98 (emphasis supplied by court). \footnote{475} \textit{Id.} (emphasis supplied by court). \footnote{476} \textit{Id.} at 97. \footnote{477} \textit{Id.} \footnote{478} \textit{Id.} at 100-01. \footnote{479} \textit{Id.} at 98 (emphasis supplied by court). \footnote{480} \textit{Id.} at 99. \footnote{481} \textit{Id.} The court obviously wished to take the opportunity which the case presented to establish this test because the indemnity clause in the master contract, like the clause in the subcontract, was also limited to claims arising from the "negligent act or omission of the Contractor." \textit{Id.} at 98.
additional indemnifications will be implied.\textsuperscript{482}

In \textit{Aymond v. Texaco, Inc.},\textsuperscript{483} the plaintiff, an employee of the drilling contractor, was injured as a result of the negligence of both his employer and Texaco. The drilling contract contained indemnification language which provided that the drilling contractor would indemnify Texaco "from all claims, demands, and causes of action in favor of Contractor's employees on account of personal injuries or death or on account of property damage, no matter how such claims arise."\textsuperscript{484} The court denied indemnification, holding that the language "no matter how such claims arise" was not broad enough to cover claims arising from the negligence of the indemnified party.\textsuperscript{485}

In light of such decisions,\textsuperscript{486} a contract should include explicit language setting forth an unequivocal intent by one party to indemnify the other for specific claims in order to ensure that a court will enforce the provisions as the parties intended. Therefore, when including indemnity provisions in the drilling contract, the parties should be certain that their intended expectations regarding indemnification responsibilities are expressly stated. For example, if the contractor is to indemnify the operator against the operator's own negligence, the contract should specifically state that the indemnity is absolute without regard to the negligence of either party or of any third party.\textsuperscript{487} Also, such indemnities should be limited "to the extent authorized by law" since an unlawful indemnity against the indemnitee's negligence may serve to invalidate the entire indemnity provision.

In an effort to uphold the terms of the drilling contract, a court may distinguish an allocation of risk provision from an indemnity provision. Such a distinction was drawn in \textit{In re Incident Aboard D/B Ocean King}.\textsuperscript{488} The operator sued the drilling contractor to recover costs incurred in controlling a blowout and extinguishing a fire and for lost profits as a result of the mishap. The jury found that both the operator and

\textsuperscript{482} Id. at 102. Since this was a construction contract, the Wyoming anti-indemnity statute, applicable to wells and mines, did not apply. \textit{See supra} subsection III(L)(1)(b) for a discussion of the Wyoming Act.

\textsuperscript{483} 554 F.2d 206 (5th Cir. 1977). This case predates the passage of the Louisiana anti-indemnity statute, discussed in subsection III(L)(1)(d), \textit{supra}.

\textsuperscript{484} Id. at 209.

\textsuperscript{485} Id. at 209-10.

\textsuperscript{486} \textit{See, e.g.,} Mott v. ODECO, 577 F.2d 273 (5th Cir. 1978), \textit{cert. denied}, 440 U.S. 912 (1979); Law v. Sea Drilling Corp., 510 F.2d 242 (5th Cir. 1975).

\textsuperscript{487} \textit{See, e.g.,} Appendix B, Article 13.9.

\textsuperscript{488} 758 F.2d 1063 (5th Cir. 1985).
drilling contractor were negligent. The drilling contractor denied liability, however, because the drilling contract provided that the risk of a blowout “from any cause” was to be borne by the operator. The operator responded that under Louisiana law, the phrase “from any cause” was insufficient to relieve the drilling contractor from his own negligence. The court held that no express reference to negligence is required where the parties are allocating the risk of their own direct loss, as distinguished from allocating liability for injury to third parties. Note, however, that each of the anti-indemnity statutes previously discussed prohibit indemnities against both loss and liability resulting from indemnitee’s negligence. Accordingly, such a distinction would not save such a provision unless it fell within a specified exception to the act in question. In that event, the court could use the distinction to validate a provision that would fail the “clear and unequivocal” or “express negligence” test for purposes of deciding whether a true indemnity clause covers the negligence of the indemnitee. This distinction could also be used for the same purpose in jurisdictions which have no anti-indemnity statute, but which do require clear or express references to the negligence of the indemnitee for an indemnity against negligence to be valid.

The indemnity provisions in most drilling contracts, including the API form, the IADC forms, and the contract forms used by many major oil companies, are similar in language and effect, whether the contract is of the footage, daywork, or turnkey type. Essentially, these provisions attempt to lessen the likelihood of litigation and make the operator and drilling contractor individually responsible for any claims made by their respective employees, subcontractors, or subcontractors’

489. Id. at 1066.
490. Id. at 1066-67.
491. The parties had stipulated that Louisiana law governed the dispute. Id. at 1067 n.5. The contract predated the passage of the Louisiana anti-indemnity statute, discussed in subsection III(L)(1)(d), supra.
492. Ocean King, 758 F.2d at 1067. The operator cited several cases which could be construed as requiring an express reference to negligence. Id.
493. Id. at 1067-68.
494. See supra subsections III(L)(1)(b)-(e).
495. Ocean King concerned a contract which predated the Louisiana anti-indemnity statute. Since the Louisiana Act applies only to indemnities against personal injury (see supra subsection III(L)(1)(d)), such a distinction would be relevant where only the indemnitee’s property interest had been injured.
496. See discussion immediately above and discussion of Texas cases supra subsection III(L)(1)(e).
497. See Appendix B, Articles 11.3-11.8.
498. See Appendix C, Articles 14.8-14.13; Appendix D, Articles 18.10-18.15; Appendix E, Articles 17.12-17.17.
employees without regard to cause, fault, or negligence of any party.\textsuperscript{499} The most common case involving an indemnity clause arises when an employee of the indemnitor is injured on the job. Even where the employer/indemnitor is negligent, the employee's claim against the employer is limited to the recovery permitted under the applicable workers' compensation act. The employee, however, may sue the third-party indemnitee on a theory of negligence and recover damages in tort far in excess of the available recovery under a workers' compensation act. If found liable, the indemnitee may claim indemnity from the employer/indemnitor to the extent permitted by law. In the absence of a lawful indemnity, workers' compensation law would shield the employer from tort liability, including contribution to the indemnitee.\textsuperscript{500} However, the employer/indemnitor may be contractually liable to the indemnitee by reason of the indemnity provision in the contract.\textsuperscript{501}

The following three subsections briefly summarize the indemnity provisions incorporated into model drilling contracts. Note, however, that company forms, such as forms used by major oil companies, may have indemnity provisions that are more one-sided.

2. Operator's Indemnification of Drilling Contractor

Under the API form, the operator "agrees to protect, defend, indemnify, and save Contractor" from claims by the operator's employees or the operator's other contractors or their employees on account of bodily injury, death, or damage to property.\textsuperscript{502} This indemnity runs against all such claims without limit and without regard to the cause or the negligence of any party. If the limits of assumed indemnity exceed those permitted by any applicable law, the indemnity is automatically amended to conform with such law.\textsuperscript{503}

In addition, with the exception of certain enumerated responsibilities assumed by the drilling contractor,\textsuperscript{504} the operator assumes responsibility for pollution or contamination resulting from "well fire, blowout,

\textsuperscript{499} This type of provision was upheld as a valid indemnity against the negligence of the indemnitee in ANR Prod. Co. v. Westburne Drilling, Inc., 581 F. Supp. 542, 546-48 (D. Colo. 1984).


\textsuperscript{501} Because this matter does not directly relate to the interpretation of drilling contracts, further discussion is beyond the scope of this paper. However, in the context of a drilling contract, see Cities Serv. Co. v. Northern Prod. Co., 705 P.2d 321 (Wyo. 1985). See also Calkins, The Oil Well Drilling Contract, supra note 51, at 3-15. See generally 2B A. LARSON, supra note 500, § 76.40.

\textsuperscript{502} Appendix B, Article 11.4.

\textsuperscript{503} See id.

\textsuperscript{504} See infra subsection III(L)(3).
cratering, seepage, or any other uncontrolled flow of oil, gas, water, or other substance" without regard to the negligence of any party, including control and removal expenses. The API form differs from the IADC forms by limiting the operator's liability to the extent that such liability may be covered by the drilling contractor's insurance. Under the IADC model turnkey contract, the drilling contractor, while drilling on a turnkey basis, promises to indemnify the operator for liability for pollution, contamination, and blowouts up to a predetermined monetary limit, above which the operator agrees to assume full responsibility and to indemnify the drilling contractor. However, while drilling under the daywork provisions of the turnkey contract, the operator makes an indemnity similar to that made under a model daywork or footage contract. Due to the potentially high cost of liability for pollution and contamination, the party with the greater bargaining power can be expected to negotiate provisions limiting its exposure.

Finally, model forms provide that the operator will indemnify the drilling contractor against claims resulting from operations which cause loss or impairment of any property right in oil, gas, other mineral substance, or water if the substance has not been reduced to physical possession above the surface of the earth. Also, the operator is responsible for any claims of damage to any formation, strata, or reservoir beneath the surface of the earth. This indemnity is necessary because drilling contractors cannot ordinarily secure insurance against the risk of underground damage; however, operators can and often do obtain such coverage.

3. Drilling Contractor's Indemnification of Operator

The drilling contractor usually "agrees to protect, defend, indemnify, and save Operator" from claims by the drilling contractor's employees or the contractor's subcontractors or their employees on account of bodily injury, death, or damage to property. This indemnity runs against all such claims without limit and without regard to the cause or

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505. Appendix B, Article 11.6.
506. Compare Appendix B, Article 11.6 with Appendix C, Article 14.11(b) and Appendix D, Article 18.12(b).
507. See Appendix E, Article 17.14(a).
508. See Appendix E, Article 17.14(b).
509. See, e.g., Appendix B, Article 11.8. The forms do not specify the party having possession above the surface.
510. Id.
511. Appendix B, Article 11.3.
the negligence of any party. If the limits of assumed indemnity exceed those permitted by any applicable law, the indemnity is automatically amended to conform with such law.

The drilling contractor normally assumes all liability for pollution or contamination resulting from drilling operations. For example, under the API form, the drilling contractor agrees to indemnify the operator for pollution and contamination "originating on or above the surface" and caused by substances "in possession and control of" the drilling contractor, without regard to the negligence of any party. Essentially, the drilling contractor assumes liability for surface spills of any substance in its possession and control which is directly associated with the contractor's equipment and operations. Generally, the contractor is not responsible for the discharge of any pollutant from below the surface resulting from blowouts or uncontrolled flows. Under the IADC model turnkey contract, the contractor, while drilling on a turnkey basis, indemnifies the operator from all pollution and contamination up to an agreed upon monetary amount, except as may be caused by the operator or operator's agents, employees, and representatives. However, while drilling under the daywork provisions of the turnkey contract, the contractor's indemnity is similar to the more limited indemnity made under the IADC model forms.

4. Indemnification of and by Third Parties

The API and IADC forms provide that all indemnity obligations and liabilities assumed by the parties under the terms of the agreement "shall have no application to claims or causes of action asserted against
Operator or Contractor by reason of any agreement of indemnity with a person or entity not a party hereto,\textsuperscript{518} which would include any third-party contractors engaged by either party.\textsuperscript{519} Essentially, this provision is inserted to ensure that neither the operator nor the drilling contractor can attempt to enter into third-party contracts which may impair or defeat the indemnity agreements or enlarge the indemnity exposure contained within the drilling contract.

As an illustration, consider \textit{Tyler v. Dowell, Inc.},\textsuperscript{520} where the drilling contract specified that the drilling contractor would indemnify the operator against all accidents and damages resulting from drilling operations.\textsuperscript{521} Subsequently, the operator entered into a well-service contract with a third party which provided that the operator would indemnify the third-party contractor against loss or damage. The drilling contractor's equipment was damaged due to the alleged negligence of the third-party contractor's sand fracking operation.\textsuperscript{522} The drilling contractor sued the third-party contractor who joined the operator as a third-party defendant based on the indemnity clause in the well-service contract. The operator then counterclaimed against the drilling contractor based on the indemnity clause in the drilling contract.\textsuperscript{523} On appeal, the court held that although the indemnity clause in the drilling contract was enforceable as between the operator and the drilling contractor, the parties did not intend for the drilling contractor to indemnify third parties under the clause.\textsuperscript{524} The court further held that the indemnity clauses in the two separate contracts would not be "construed together to effect a circuitry of rights and liabilities" so as to exempt the third-party contractor from liability for its own negligence.\textsuperscript{525} The court reasoned that since the well-service contract was entered into by the operator with the third-party contractor subsequent to the drilling contract, the two contracts "were in no wise connected with respect to rights and duties to be imposed" and that "[e]ach stands upon its own footing independently of the other."\textsuperscript{526}

\textsuperscript{518} Appendix B, Article 13.9. For nearly identical provisions, see also Appendix C, Article 14.13; Appendix D, Article 18.15; Appendix E, Article 17.17.

\textsuperscript{519} See Appendix B, Article 13.9. This provision also states that indemnity is assumed without limitation in accordance with the other terms of the drilling contract and that indemnity will operate without regard to the cause or the negligence of any party. This language is inserted to satisfy strict tests for indemnification against negligence. \textit{See} discussion \textit{supra} subsection III(L)(1)(e).

\textsuperscript{520} 274 F.2d 890 (10th Cir.), \textit{cert. denied}, 363 U.S. 812 (1960).

\textsuperscript{521} Id. at 894-95.

\textsuperscript{522} Id. at 893.

\textsuperscript{523} Id.

\textsuperscript{524} Id. at 895.

\textsuperscript{525} Id. at 896.

\textsuperscript{526} Id.
The model drilling contracts attempt to achieve the same result by using express language.\textsuperscript{527}

In light of the above discussion, the operator and drilling contractor may allocate risk between them by the terms of the drilling contract. In the case of third parties, such as between the drilling contractor and subcontractor (or operator and other contractor), the terms of their respective contracts govern risk allocation. However, such contract may not and should not modify the rights and liabilities of the operator and drilling contractor under the drilling contract. Therefore, the net result is that, insofar as the operator and drilling contractor are concerned, the responsibilities and liabilities for loss arising from the work of a third-party contractor will be resolved as if the party (the operator or drilling contractor) who contracted for the third-party services had done the work itself, subject to the provisions set forth in the drilling contract.

M. Special Provisions Concerning Allocation of Risk

1. Blowouts (Pollution and Contamination)

The sudden, violent expulsion of oil, gas, drilling mud, and debris which may occur during a blowout may potentially result in tremendous exposure to liability for any resulting pollution, contamination, or other damages.\textsuperscript{528} The API\textsuperscript{529} and IADC\textsuperscript{530} forms place the responsibility for pollution or contamination caused by blowouts on the operator, regardless of the negligence of any party.\textsuperscript{531} In many cases, however, in addition to pollution and contamination damages, a blowout may cause loss of or damage to the equipment of the operator, contractor, and third parties, or may result in loss or damage to the hole. The responsibility for these latter types of losses is governed by other provisions of the drilling contract.\textsuperscript{532}

Drilling contracts vary with respect to the limits of the operator’s liability for pollution and contamination damages. For example, the API form shifts the responsibility for damages to the operator only to the extent that such damages are not covered by the drilling contractor’s

\textsuperscript{527} See Appendix B, Article 13.9 (last sentence).
\textsuperscript{528} For further discussion regarding blowout, see Appendix F.
\textsuperscript{529} See Appendix B, Article 11.6.
\textsuperscript{530} See Appendix C, Article 14.10 and 14.11; Appendix D, Article 18.12; Appendix E, Article 17.14.
\textsuperscript{531} For a more specific discussion of the operator’s indemnification of the drilling contractor, see supra subsection III(L)(2).
\textsuperscript{532} See infra discussions concerning damage to equipment, subsection III(N), and damage to the hole, subsection III(O).
insurance. No such limitation appears in the IADC forms. The IADC model turnkey form provides that when operations are being conducted on a daywork basis, the operator assumes full responsibility for pollution and contamination resulting from a blowout. However, when operations under the contract are being conducted on a turnkey basis, the drilling contractor is responsible for such damages up to a predetermined monetary amount; the operator is responsible for pollution and contamination damages exceeding that amount. In light of these variations and the tremendous exposure to liability which may arise from a blowout, both the operator and the drilling contractor should specifically allocate the responsibility for such damages in negotiating a drilling contract so that each party may obtain appropriate insurance coverage. Most drilling contractors cannot buy high-limit pollution or contamination insurance at a reasonable cost without large deductibles; however, prudent operators do secure such coverage. Nevertheless, because of its high cost, the operator may elect not to buy this coverage when drilling in an area where the likelihood of a blowout is extremely remote. Note that the model form contracts do not require the operator to maintain such insurance, and contractors should satisfy themselves as to an operator's financial ability to respond to this or any other liability assumed by the operator.

Disputes can arise over the meaning of the term “blowout,” even when the term has been defined in the contract. In *Phillip Rosamond Drilling Co. v. St. Paul Fire and Marine Insurance Co.*, the drilling contractor's insurer denied coverage where the drilling crew was able to cement in the well, although well control was lost and drilling fluid was expelled. The insurer argued that the mishap did not constitute a “blowout” within the meaning of the policy because the policy required that the well must be completely out of control. In ruling for the drilling contractor, the court held that a well is completely out of control when there is “adverse pressure and flow of gas or liquid from the well which cannot be corrected by injection of drilling mud or otherwise to

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533. See Appendix B, Article 11.6.
534. See Appendix E, Article 17.14(b).
535. This amount would typically be whatever insurance limits the contractor had included in the bid. The cost of such insurance should be reflected in the turnkey price.
536. See Appendix E, Article 17.14(a).
538. Id. at 632.
539. Id. at 633.
allow the operator to continue normal drilling operations." In so ruling, the court relied on expert testimony as to the meaning of the term "blowout" as used within the oil and gas industry.

2. Well Control and Lost Circulation

Classic examples of well control are shutting in a major blowout and extinguishing a raging well fire (often involving the drilling of relief wells). However, well control also includes the cementing of the well when the pressures of escaping gas or liquid from the hole have proven to be otherwise uncontrollable. While the costs associated with the latter are likely small in comparison to the former, in either case the parties to the drilling contract should fully evaluate potential liability for damages and costs resulting from loss and restoration of well control.

Under the various API and IADC model form drilling contracts, liability for well control largely depends on whether the contract is of the daywork or the footage type. Under the daywork contract, the operator is generally in charge of directing the drilling operations; hence, the operator assumes liability for any needed well control and attendant costs. Note that footage and most turnkey contracts contain provisions which specify that certain operations will be conducted on a daywork basis. Consequently, when operations are conducted under the daywork provisions of the API or IADC forms, the operator is expressly made responsible for the costs involved in controlling a "wild" well. Therefore, if the drilling contract calls for daywork operations, the operator should obtain adequate insurance to protect against costs which may be incurred because well control is required.

The allocation of responsibility for controlling a wild well is not as clearly defined under the footage provisions of the API form since there is no express allocation of responsibility for well control to either the drilling contractor or the operator while drilling on a footage basis. Under footage contracts, the drilling contractor normally assumes the

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540. Id. at 634.
541. Id.
542. Prudent operators carry well control insurance or self-insure against such mishaps.
543. See supra subsection II(C)(1).
544. See, e.g., Appendix B, Article 13.7.
545. See id.
546. See Appendix C, Article 14.10 and 14.11; Appendix D, Article 18.12; Appendix E, Article 17.14(b).
547. Note that the obligation to control a wild well and the responsibility for loss or damage resulting from a wild well are distinguishable.
general responsibility for conducting the drilling operations.\textsuperscript{548} However, most footage contracts, including the API\textsuperscript{549} and IADC\textsuperscript{550} forms, include provisions whereby the basis of compensation reverts to daywork whenever the contractor encounters abnormal pressures, lost circulation, or circumstances beyond the control of the driller.\textsuperscript{551} Accordingly, when control of a well is lost in these situations, responsibility for well control and associated costs would be assumed by the operator under the daywork provisions of the footage contract. However, if the loss of well control results from causes attributable to the drilling contractor’s operations while drilling on a footage basis, the contractor apparently assumes the responsibility for regaining control of the well and for any associated costs. This is because the contract provides that “should a fire or blow-out occur or should the hole for any cause attributable to Contractor’s operations be lost or damaged, . . . all such loss or damage shall be borne by Contractor.”\textsuperscript{552} Accordingly, under a footage contract, the parties must carefully define the circumstances when drilling switches from a footage to a daywork basis.\textsuperscript{553}

The API\textsuperscript{554} and IADC footage\textsuperscript{555} forms provide that the contractor is responsible for restoring lost circulation for a specified time period, after which efforts to restore circulation are to be performed on a daywork basis. In \textit{Blackstock Drilling Co. v. R. Olsen Oil Co.},\textsuperscript{556} the contractor expressly assumed the risk of restoring lost circulation for a period of twenty-four hours. However, “‘should circulation of mud or fluid be lost for more than 24 hours in any one instance, [the operator] shall pay the contractor on a daywork basis for work performed.’”\textsuperscript{557} Since the twenty-four-hour period commenced when circulation was first lost, the definition of “lost circulation” was central to the shifting of the contract rate from footage to daywork. The court defined lost circulation to mean:

\begin{quote}
[\textit{A}ny interruption of the return of the mud forced into the hole which would prevent its flowing out of the hole in substantially the same
\end{quote}

\textsuperscript{548} See supra subsection II(C)(2).
\textsuperscript{549} See Appendix B, Article 3.3(c); Appendix A, Article 16.
\textsuperscript{550} See Appendix D, Article 12.
\textsuperscript{551} See supra subsection II(C)(2).
\textsuperscript{552} Appendix B, Article 13.6.
\textsuperscript{553} See, e.g., Appendix A, Article 16.
\textsuperscript{554} See, e.g., Appendix A, Article 16.1.
\textsuperscript{555} See Appendix D, Article 12.3.
\textsuperscript{556} 72 F. Supp. 358 (W.D. Okla. 1947).
\textsuperscript{557} \textit{Id.} at 359.
quantity that was forced into the hole. There might be a partial interruption of circulation, or there might be complete interference with the circulation, so that no mud would return to the surface. However, any interference with the circulation which would prevent the elimination of the cuttings at the bottom of the hole and the proper conditioning of the structure into which the drill was cutting, could be termed lost circulation.558

After defining lost circulation, the court held that the contractor was entitled to daywork compensation for the entire period of lost circulation if such period exceeded twenty-four hours, including the initial twenty-four-hour period.559 In contrast, the model forms currently provide that should lost circulation persist, "then after a period of ____ hours consumed in such efforts, further operations shall be conducted on a daywork basis . . . until normal drilling operations can be resumed."560

In Startex Drilling Co. v. Sohio Petroleum Co.,561 the court described circulation and lost circulation as follows:

[C]irculation in its most general meaning refers to that feature of drilling an oil well, whereby some type of drilling fluid or mud is pumped down the drill pipe. This is done to lubricate the drill bit, and to remove the earthen cuttings from the hole as the fluid recirculates to the surface. It also provides weight to the drilling column thus decreasing the danger of a gas pressure "blow out". Another term used by the parties to describe circulation is "returns," i.e., the return of the drilling fluid to the surface.

Occasionally, because of gaps or porosity in the formation, some or all of the drilling fluid will escape from the drilling column rather than returning to the surface. The parties agree that the term "loss of circulation" certainly applies in describing a situation where none of the drilling fluid returns to the surface. On the other hand, they also agree that the definition of the term "normal circulation" encompasses the situation where 100% of the regular, scheduled drilling fluid comes back. Their dispute arises in applying the terms loss of circulation and normal circulation, when the contractor is experiencing partial returns (as, for example, when only 80% of the drilling fluid returns) and is forced to use a special mud program not contemplated by the drilling order.562

558. Id. at 360.
559. Id.
560. Appendix A, Article 16.1; Appendix D, Article 12.3. In addition, these forms provide a total cumulative time for which the contractor must assume the risk of lost circulation and provide that any footage drilled during daywork operations must be deducted from the footage charged. Id.
561. 680 F.2d 412 (5th Cir. 1982).
562. Id. at 413-14 (emphasis in original).
The contract in question was an API form footage contract. The contract provided that the contractor should bear the expense of restoring circulation, including the expense of "any fishing job or sticking of drill pipe, or other difficulty," for the first eight hours and that thereafter such expense should be borne by the operator on a daywork basis. Beginning on July 25, circulation was completely lost. This problem continued for a period of eight hours, so the operator's representative took over control of the drilling operations. In the opinion of the operator's representative, normal circulation was restored in a few additional hours, so he left the rig. Thereafter, returns were as high as eighty percent. Four days later, drill pipe got stuck in the hole. The ensuing fishing operation took nearly a month and cost $142,630.00, which sum was paid by the drilling contractor to a third party. Drilling resumed, but shortly thereafter circulation was lost, and the operator took over the well through completion on September 12. The drilling contractor billed the operator for daywork for all time after the eight-hour period following the initial loss of circulation on July 25 and billed the operator for the cost of the fishing operation. The operator disputed the daywork charges following the time when its representative left the rig on the morning of July 26, contending that at that time normal circulation had been restored. Further, he disputed his liability for the fishing costs, contending that the drill pipe got stuck during normal circulation. The question of proper interpretation of the contract was submitted to the jury, which found for the drilling contractor on both matters. On appeal, the court agreed with the trial judge, finding that the contract was ambiguous and that the matter was properly submitted to the jury. The appellate court affirmed the jury's findings in favor of the drilling contractor. However, the court stated that both the drilling contractor and the operator presented plausible arguments. This suggests that had the jury found for the operator, that verdict would also have been affirmed. Accordingly, because the appellate court agreed that the contract was ambiguous, and because the appellate court suggested that it would have affirmed a jury verdict in favor of either party, operators and contractors may need to define specifically the term "loss of circulation"
in the contract.\textsuperscript{570}

In \textit{Inland Drilling Co. v. Davis Oil Co.},\textsuperscript{571} circulation problems were encountered from the outset.\textsuperscript{572} At a depth of sixty-nine feet, the rotary

\textsuperscript{570} A portion of each party's arguments as summarized by the court are illustrative of the definitional problem:

Sohio [operator] argued that the explanation for the footage rate/day rate distinction was a simple one. When the contractor is making drilling progress it gets paid by the foot and is only entitled to a day rate when no footage progress is being made. Accordingly, Sohio defined loss of circulation as a loss of fluid sufficient to stop drilling progress, regardless of the particular percentage of returns that might be involved. Sohio told the jury the proof is in the drilling. It contended that it was incongruous for Startex [drilling contractor] to claim a day rate for periods like July 26-29 when it drilled over 1000 feet—irrespective of what its returns were. This absurd construction meant that a day rate should be paid when even a single drop of fluid doesn't return to the surface.

Sohio further contended that partial returns are customary in the Sprayberry Trend. Even if having partial returns slows drilling progress, as Startex claimed, it was to be anticipated by the contractor in making his bid [Startex had drilled a prior well in the area]. The contractor could simply set a higher footage basis to compensate for those slower periods. Sohio also contends because partial returns are normal in that area partial circulation fits the definition of normal circulation as intended by the parties [under the contract]. After the period of total loss of circulation July 25-26, Startex resumed drilling progress with partial returns of up to 80%. Thus, normal circulation for this area was restored. Because the drill pipe stuck during this normal condition, Startex became liable for the fishing job.

Sohio's other argument to the jury was predicated on the language of [the contract] that the operator must concur in the loss of circulation condition before the contractor can receive a day rate. Sohio's witnesses testified that because a contractor on day work is being paid by the hour, and not for his progress, it is customary in the industry for the operator, after concurring, to take over and minimize the time the contractor spends on day work. The jury was told that the surest sign in the industry of whether a contractor is on day work is to look to see who's in charge of the well—if it is daywork, the operator will always be in charge. If he's not there, it is understood that the job is by the foot . . .

Startex . . . explained that the day rate is negotiated not just to protect the contractor when drilling progress has ceased, but also when it slows. Startex sponsored testimony that a contractor submits his bid based in part on the mud program (i.e. drilling fluid) specified on the drilling order. Here, that mud program essentially called for the use of water and oil emulsion. Both sides' witnesses agreed that when the contractor loses circulation, it must inject special materials into the drilling fluid such as gels, paper, cottonseed hulls, and fiber. This is done to plug the leaks in the formation and regain circulation. Adding these materials not only slows down drilling because they are thicker than water, but the materials themselves are an additional expense. Startex argued that the footage rate isn't designed to compensate for the added expense and diminished progress occasioned by a change from the mud program specified in the drilling order. Startex's ultimate position was that in light of the admitted loss of circulation on July 25-26 the question became: when was normal circulation restored? It submits . . . never, because Startex was unable to get back to the specified mud program. So, in rebuttal to Sohio's claim that the determining factor is who's in control of the well, Startex said the proper indication was to look at the mud program.

Startex also attacked Sohio's argument that a day rate can't be collected when drilling progress is being made. It pointed out that drilling progress was made during the July 25-26 period when Sohio concurred the day work rate was applicable.

\textit{Id.} at 415-16. While this author believes that Startex had the better argument, the parties to a drilling contract would be better served by a more precise definition of lost circulation than by rolling the dice with a jury.

\textsuperscript{571} 183 Neb. 116, 158 N.W.2d 536 (1968).

\textsuperscript{572} \textit{Id.} at 119, 158 N.W.2d at 538.
The rig was removed and a spudder brought in. The spudder drilled to a depth of 142 feet, where circulation was regained and rotary drilling resumed. Although some circulation problems occurred thereafter, the contractor drilled to a depth of 2,407 feet. The footage contract provided that daywork rates would apply following twenty-four hours of lost circulation. The court held that the contractor was entitled to daywork rates for the entire period of lost circulation, including the time the spudder was drilling. Furthermore, the operator was responsible for the costs of the spudder, and the contractor was entitled to footage rates for all footage drilled, except the seventy-three feet drilled by the spudder.

A variation on the allocation of the risk associated with regaining control of a wild well is found in the IADC (Oklahoma-Texas Panhandle Chapter) Model Turnkey contract. When drilling operations are being conducted on a turnkey basis, the drilling contractor is liable for well control up to a predetermined cost, at which point the operator assumes any liability costs exceeding the predetermined amount. Thus, when using this turnkey drilling contract form, both the operator and the contractor should carry insurance adequate to cover their respective shares of any potential liability for well control.

Because of the high cost of this insurance coverage, the operator and drilling contractor may decide not to procure this coverage when drilling in an area where well control problems are unlikely to occur. Note, however, that failure to insure adequately against such problems can lead to bankruptcy in the event of a major catastrophe. Accordingly, prudent operators carry blowout insurance, and conservation commissions will require operators to post bonds that, in part, may underwrite well control mishaps.

3. Costs of Redrilling

Both the operator under a contract containing daywork provisions and the drilling contractor under a footage or turnkey contract may obtain insurance covering the risk of redrilling the well should problems

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573. Id.
574. Id. at 118, 158 N.W.2d at 538.
575. Id. at 121-22, 158 N.W.2d at 539-40.
576. Id.
577. See Appendix E, Article 17.14(a). This predetermined cost would reflect the amount of insurance the drilling contractor has to cover well control. The cost of this insurance should necessarily be reflected in the turnkey price.
arise. However, because of its high cost, many operators and contractors do not procure this coverage. Potential problems include excessive deviation from the straight hole specifications, special drilling problems such as abnormal pressures or hazardous formations, blowout, fire, and negligence. Generally, the model drilling contract forms place all liability for the costs of redrilling on the operator if operations are being conducted on a daywork basis. If operations are being conducted on a footage basis, the drilling contractor is liable for the costs of redrilling if the existing well is lost or damaged by any cause attributable to the contractor's operations. However, if the hole is damaged or lost due to the failure of the operator's casing or equipment or to the failure of the cementing job, the operator must pay the contractor for footage already drilled, for work performed in trying to restore the hole, and for the costs of rigging down, moving the rig to a new location, and rigging up in the event a substitute well is drilled. The work of drilling the replacement well is then performed under the terms and conditions of the original contract.

4. Waiver of Subrogation

Model drilling contract forms provide that both the operator and the contractor must secure special endorsements from their insurance underwriters which waive subrogation rights for the respective liabilities assumed. Operator-oriented forms, however, generally provide for such a waiver by only the drilling contractor.

A waiver of subrogation rights is commonly inserted in commercial contracts that allocate risk, and such a waiver will not ordinarily be set aside by a court as contrary to public policy, except where specifically

578. Most operators do carry such insurance. However, the policies provide coverage only for mishaps specifically mentioned in the policy.
579. For further discussion on the damage to the hole, see infra subsection III(O).
580. See, e.g., Appendix B, Articles 8.5, 13.6(a), and 13.6(b).
581. See, e.g., Appendix B, Article 13.6(a).
582. See, e.g., Appendix B, Article 13.6(b).
583. Id.
584. See Appendix B, Article 11.1(g); Appendix C, Article 13; Appendix D, Article 16; Appendix E, Article 15.
585. Generally, insurance companies reserve the right of subrogation—the right to step into the shoes of the insured and sue any party that the insured could have sued. See generally I. TAYLOR, THE LAW OF INSURANCE 20-22 (3d ed. 1983).
586. See Hancock, supra note 470, at 611.
prohibited by statute. When entering into a drilling contract, the parties should agree about who will bear what risks, with each party either self-insuring or procuring insurance adequate to cover its respective risks. Logic dictates that the parties agree to waive subrogation so that both parties will get what was bargained for—the allocation of certain risks and the elimination of the need to secure duplicate insurance coverage. If an insurer is allowed, by way of subrogation or otherwise, to ignore the risk allocation the parties have made, the parties lose the benefit of the bargain and will be forced to secure duplicate insurance coverage.

5. Operator as Named Co-Insured

In addition to requiring the drilling contractor to waive all rights of subrogation, the operator may require that the contractor's insurance policies name the operator as an additional, or co-insured. By doing so, the operator is afforded coverage under the drilling contractor's policies for covered liabilities resulting from the operator's activities undertaken in the performance of the drilling contract. While this provision is not included in model drilling contract forms, such a provision may be inserted as an additional requirement. This provision is not viewed as exculpatory in nature and will not ordinarily be invalidated by a court as against public policy, except where specifically prohibited by statute. Hence, many major operators seek such a provision. Of course, in theory such an endorsement may increase the cost of insurance coverage. However, the added cost could be reflected in the compensation paid the drilling contractor under the terms of the drilling contract, and this device may avoid some litigation. There are, however, 587

587. See, e.g., supra subsection III(L)(1)(d) for a discussion of the Louisiana anti-indemnity statute.
589. The drilling contractor could require the same terms with respect to the operator's insurance. However, as previously mentioned, most drilling contracts do not require the operator to have insurance.
590. See, e.g., Appendix B, Article 11.1(e), (f) where blank spaces allow for the insertion of additional insurance provisions.
591. See Brashar, 626 F. Supp. at 437, wherein the court also concluded that such a provision did not violate the New Mexico anti-indemnity statute, discussed supra at subsection III(L)(1)(d). See generally I. Taylor, supra note 585, at 74.
592. See, e.g., supra subsection III(L)(1)(d) for a discussion of the Louisiana anti-indemnity statute.
593. Of course, a drilling contractor may make the same request of the operator; however, the contractor may not have sufficient bargaining power to secure the provision.
594. But, due to market conditions, perhaps not in practice.
practical problems. Because most drilling contractors maintain blanket policies, the insurer may be unwilling to include a number of operators, with different claims experience, as named insureds. In situations where the insurer did agree, the cost of additional premiums could make such a practice prohibitive. If accomplished, however, the drilling contractor should be careful to limit such an endorsement to the extent of liabilities assumed under the contract.

N. Damage to Equipment

1. Operator’s Equipment

The operator will normally have equipment present at the well site, including such items as casing, tubing, and wellhead equipment.\(^{595}\) Most drilling contracts, including the API\(^{596}\) and IADC\(^{597}\) forms, provide that the operator assumes liability at all times for damage to or destruction of the operator’s equipment, and that the drilling contractor shall be under no liability to reimburse the operator for any such loss or damage.

Under both the API\(^{598}\) and IADC\(^{599}\) forms, the drilling contractor agrees “to visually inspect” all materials furnished by the operator and to notify the operator of any “apparent defects.”\(^{600}\) These forms also provide that the contractor “shall not be liable for any loss or damage resulting from the use of materials furnished by Operator or failure to notify Operator of defects.”\(^{601}\) While this waiver of liability is unequivocally stated and consistent with the operator’s affirmative assumption of risk discussed in the previous paragraph, a court would likely hold the contractor responsible for losses incurred by reason of defective materials, where the contractor failed to inspect and thereby discover obvious visible defects or failed to warn the operator of such defects.

In *Warren-Bradshaw Exploration Co. v. Tripplehorn*,\(^{602}\) the operator, in accordance with the drilling contract, delivered casing to the well

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595. For a typical listing of equipment to be furnished by the operator in a footage or daywork contract, see Appendix A, Article 5.
596. See Appendix B, Article 13.5.
597. See Appendix C, Article 14.4; Appendix D, Article 18.5; Appendix E, Article 17.6.
598. See Appendix B, Article 13.8.
599. See Appendix C, Article 14.7; Appendix D, Article 18.9; Appendix E, Article 17.11.
600. Appendix C, Article 14.7; Appendix D, Article 18.9; Appendix E, Article 17.11. Some operator-oriented contracts provide that the contractor owes a general duty to inspect materials furnished by the operator and then relieve the contractor from responsibility for "latent" defects.
602. 220 F.2d 291 (5th Cir. 1955).
site. The drilling contractor examined the casing and notified the opera-
tor's representative that the casing was defective. The representative di-
rected the contractor to use the furnished casing. The casing broke in the
hole and efforts to retrieve it proved unsuccessful. In accordance with
the terms of the contract, the court held that the contractor had fulfilled
its duty to inspect and notify, that the contractor was not negligent in
continuing drilling operations at the direction of the operator's represen-
tative, and that the operator was estopped from attempting to place lia-

2. Drilling Contractor's Equipment

The risk of destruction or damage to the drilling contractor's sur-
face equipment is normally borne by the contractor. As a result, the
model form drilling contracts provide that the contractor shall assume
liability at all times for damage to or destruction of the contractor's
equipment while it is on the surface, regardless of whether drilling opera-
tions are being conducted on a daywork, footage, or turnkey basis. This
assumption of liability extends to equipment such as drilling tools, ma-
chinery, and appliances for use above the surface, and remains the re-
sponsibility of the drilling contractor regardless of when or how such
damage or destruction occurs.

The model forms contain two important limitations on the assump-
tion of risk of damage to the contractor's surface equipment. First, the
operator is responsible for damage to surface equipment when the dam-
age results from the operator's failure to prepare a sound surface loca-
tion, including damage resulting from subsurface conditions, such as
mines, caverns, sink holes, streams, pipelines, power lines, and telephone
lines. In the event that such damage occurs, the operator must reim-
burse the drilling contractor to the extent such damage is not covered by
the contractor's insurance. In addition, the operator must compensate
the drilling contractor during any resulting periods of work stoppage or

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603. Id. at 292.
604. See Appendix B, Article 13.1; Appendix C, Article 14.1; Appendix D, Article 18.1; Appen-
dix E, Article 17.1.
605. See Appendix B, Article 13.1.
606. See, e.g., Appendix B, Article 13.1(a); Appendix C, Article 10; Appendix D, Article 15;
Appendix E, Article 14.2. Under the API and IADC model forms, the operator is responsible for
preparing a sound location and road. See supra subsection III(C)(5).
607. See Appendix B, Article 13.1(a); Appendix C, Article 10; Appendix D, Article 15; Appen-
dix E, Article 14.2. The API form differs from the IADC forms by placing a $100,000 limit on such
a reimbursement.
related repair at applicable daywork rates. This reimbursement provision is included because the operator selects the location, and the drilling contractor has no knowledge of the operator's preparation of the well site and no knowledge of subsurface conditions that could cause cratering or loss of the rig.

Second, except when drilling on a turnkey basis, the operator must reimburse the drilling contractor when the contractor's surface or in-hole equipment is damaged or lost due to exposure to a highly corrosive or otherwise destructive environment, such as hydrogen sulfide emissions from the well. The IADC forms expressly provide that such corrosive elements include those which may be introduced into the drilling fluid and cause damage either to surface or to in-hole equipment. The API form's counterpart provision also includes corrosive substances introduced into the drilling fluid, but applies only to damage to the contractor's in-hole equipment. Under the API form, in the event that such damage occurs, the operator must reimburse the drilling contractor to the extent that such damage is not covered by the contractor's insurance. The IADC forms do not contain this limitation. In addition, the operator must compensate the drilling contractor during any resulting periods of work stoppage or related repair at applicable daywork rates.

Apart from liability for damage caused by corrosive substances, liability for damage to or destruction of the drilling contractor's in-hole equipment depends largely on whether the contract is of the daywork, footage, or turnkey type. Under a daywork contract, the operator is

609. See Appendix E, Article 17.4.
610. See Appendix B, Articles 13.1(b) and 13.2; Appendix C, Article 14.3; Appendix D, Article 18.4; Appendix E, Article 17.5.
611. See Appendix C, Article 14.3; Appendix D, Article 18.4; Appendix E, Article 17.5.
612. Compare Appendix B, Articles 13.1(b) and 13.2.
613. See id.
614. See Appendix C, Article 14.3; Appendix D, Article 18.4; Appendix E, Article 17.5.
615. See Appendix B, Article 13.1(a).
616. Historically, drilling contracts did not specifically address the loss of in-hole equipment. Hence, cases involving loss or damage to a contractor's in-hole equipment were often decided under the law of bailment. For example, in Ryan v. Schwab, 261 S.W.2d 605 (Tex. Civ. App.—Fort Worth 1953, no writ), the operator was directing drilling operations on a daywork basis when hot flowing salt water was encountered. Id. at 606. When other well control measures failed, the operator ordered the drill pipe to be dropped into the hole and the well sealed off. Id. The court concluded that the operator was a bailee of the drill pipe, but was acting in the mutual benefit of both the bailor (contractor) and itself, and that the operator was not negligent in ordering the release of the drill pipe. Accordingly, the court held that the operator was not responsible for the lost drill pipe. Id. at 609.
generally in charge of directing the drilling operations.\textsuperscript{617} Hence, the operator assumes liability for any damage to or destruction of the drilling contractor’s in-hole equipment, such as drill pipe, drill collars, and tool joints. As a result, under the daywork provisions of the API\textsuperscript{618} and IADC\textsuperscript{619} forms, the operator must reimburse the drilling contractor for the current repair cost or a percentage of the current new replacement cost.\textsuperscript{620} Under the API form, in the event such damage occurs, the operator must reimburse the drilling contractor to the extent that the damage is not covered by the contractor’s insurance.\textsuperscript{621} Typically, a contractor’s property insurance excludes coverage for the drill string while in the hole. The IADC forms do not contain this insurance limitation.\textsuperscript{622}

The daywork provisions of the API form limit the operator’s liability to “tools and equipment lost or damaged in the hole.”\textsuperscript{623} The daywork provisions of the IADC forms provide that the operator assumes liability “at all times for damage to or destruction of Contractor’s in-hole equipment.”\textsuperscript{624} Accordingly, under the API forms, the operator is liable for damage to tools and equipment \textit{actually in} the hole. Under the IADC forms, the operator appears to be liable for equipment used in the hole, whether or not the equipment is actually in the hole at the time of damage.

While drilling on a footage or turnkey basis, the drilling contractor normally assumes responsibility for conducting the drilling operations.\textsuperscript{625}

\textsuperscript{617} See supra subsection II(C)(1).
\textsuperscript{618} See Appendix B, Article 13.4.
\textsuperscript{619} Appendix C, Article 14.2; Appendix D, Article 18.3; Appendix E, Article 17.3.
\textsuperscript{620} See, e.g., Appendix A, Article 14.6. In Newitt v. Camden Drilling Co., 552 S.W.2d 928 (Tex. Civ. App.— Corpus Christi 1977, no writ), an operator leased a drilling barge, drill pipe, and other equipment in an arrangement analogous to a daywork contract. Id. at 929. Drill pipe was lost in the hole, and under the terms of the contract, the operator had to return the used pipe or pay 100\% of the new replacement cost. Id. at 930. The operator estimated “fishing” costs to retrieve the pipe to be $9,000 to $18,000 and estimated replacement costs to be $22,000. The operator then contacted the owner of the pipe (lessor) to discuss the matter. The operator contended that the owner agreed to accept “fair market value” for the lost pipe, so the operator plugged and abandoned the well leaving the drill pipe in the hole. Id. In a suit between the operator and the owner, the jury found that the lessor had agreed to accept fair market value for the lost pipe and that the operator had plugged the well and abandoned the pipe in reliance upon this agreement. This prompted the appellate court to conclude that the parties had reached a novation. This is yet another illustration of a written contract being modified by oral agreement and course of performance. See supra subsection III(c)(6).
\textsuperscript{621} See Appendix B, Article 13.4.
\textsuperscript{622} See Appendix C, Article 14.2; Appendix D, Article 18.3; Appendix E, Article 17.3.
\textsuperscript{623} Appendix B, Article 13.4.
\textsuperscript{624} Appendix C, Article 14.2; Appendix D, Article 18.3; Appendix E, Article 17.3.
\textsuperscript{625} See supra subsections II(C)(2), (3).
Accordingly, the drilling contractor ordinarily assumes the risk of damage to or destruction of the contractor's in-hole equipment. However, most footage contracts, including the API and IADC forms, generally include provisions shifting such risks to the operator when the damage or destruction occurs as a result of encountering abnormal pressures, losing circulation, or encountering formations which are difficult or hazardous to drill. In addition, under a turnkey contract, services performed by the contractor beyond those specified in the contract are generally conducted on a daywork basis. The operator ordinarily assumes the risk of loss to the contractor's in-hole equipment and to all equipment damaged by corrosive substances while daywork operations are being conducted.

3. Third Party's Equipment

The API form provides that all of the liabilities assumed by the parties under the terms of the agreement "shall have no application to claims or causes of action asserted against Operator or Contractor by reason of any agreement of indemnity with a person or entity not a party hereto," which would include any third-party contractors engaged by either party. Essentially, a drilling contract normally provides for the assumption of risk of damage to equipment only as between the operator and the drilling contractor. In the case of third parties, any assumption of risk of damage to equipment as between the operator/contractor and subcontractor will be governed by the terms of the subcontract and will not modify the rights and liabilities of the operator and contractor under the drilling contract. Thus, when entering into contracts with a third party, the operator or drilling contractor should be certain to allocate the risk of loss or damage specifically to a third party's equipment.

If the drilling contract is unclear about third-party equipment, disputes can easily arise. For example, in Zephyr Oil Co. v. Cockburn,
the parties apparently entered into a turnkey contract whereby the contractor agreed to drill the well for a specified sum of money plus an interest in certain oil properties. The contractor agreed to "at his own expense take such cores and make such drill stem tests as in his judgment are deemed advisable, and is to stand by, at his own expense, while the Schlumberger is being run. . . . All Schlumberger expense is to be paid by the [operator]." The contract further provided that the contractor "shall drill said well as an independent contractor, and as such, except as herein provided shall save and hold [operator] harmless from all expenses and liability incurred in the performance of this contract." The Schlumberger electric logging device was furnished and run by the Schlumberger Well Surveying Corporation, a third-party contractor. A gun (part of the logging device) used to collect sidewall samples became lodged in the hole and then lost. Ultimately, the gun was fished out and drilling resumed after the hole was reconditioned. The contractor had apparently objected to the use of the gun for taking sidewall samples because of the likelihood that the gun would get stuck. The court affirmed a jury finding that custom and usage in the industry did not require the operator to reimburse the contractor for the cost of the fishing operations. Although the reasoning of the trial and appellate courts is unclear, the courts apparently construed the contract as requiring the contractor to stand by at its own expense while the Schlumberger operations were being run, including the time spent on fishing operations, and that the operator's promise to pay "[a]ll Schlumberger expense" was limited to the third party's fee for the logging service.

O. Damage to Hole

In the course of drilling operations, there is substantial risk of damage to the hole or well bore. Such damage may be so minor that the hole can be cleaned out and redrilled, or so extensive that the well must be plugged and abandoned and a replacement well drilled. The damage might result from a deviation from straight-hole specifications, loss of

635. Id. at 648.
636. Id. at 649 (emphasis in original). A Schlumberger (pronounced slum-bur-jay) is a special electric well-logging device. H. WILLIAMS & C. MEYERS, supra note 71, at 883.
637. Zephyr Oil, 215 S.W.2d at 649.
638. Id. at 650.
639. Id.
640. Id. at 650-51.
641. For discussion on which party must bear the costs of redrilling, see supra subsection III(M)(3).
equipment in the hole, fire, cratering, blowout, or other events. Regardless of the cause or extent of the damage, the responsibility for such liability should be clearly allocated between the operator and the drilling contractor.

Under the various API and IADC forms, liability for damage to the hole depends largely on whether the contract is a daywork or footage agreement. Under a daywork contract, the operator is generally in charge of directing the drilling operations. Hence, the operator assumes liability for any damage to the hole. Note that footage contracts contain provisions under which specified operations will be conducted on a daywork basis. Consequently, when operations are conducted under the daywork provisions of the model forms, the operator is expressly responsible for any damage to or loss of the hole, including any casing in the hole.

Under footage contracts, the drilling contractor normally assumes responsibility for conducting the drilling operations. Accordingly, under the footage provisions of the API, IADC footage, and IADC turnkey drilling contracts, such loss or damage is borne by the contractor in the event a fire or blowout occurs, or if the hole, for any cause attributable to the contractor’s operations, is lost or damaged. Note that the drilling contractor’s liability under this provision is potentially very great, as loss of the hole could include consequential damages, such as lost profits. However, model form contracts provide that neither party is liable to the other for “special, indirect, or consequential damages”

642. One deficiency in the model forms is that the term “hole” is not defined.
643. See supra subsection II(C)(1).
644. See Appendix B, Article 13.7. See also Appendix C, Article 14.5; Appendix D, Article 18.7; Appendix E, Article 17.8. In Samson Resources Co. v. Quarles Drilling Co., 783 P.2d 974 (Okla. Ct. App. 1989), the operator alleged that the contractor, drilling under a footage contract, was negligent and fraudulent in a series of actions that ultimately led to loss of the hole. The contractor contended that the problems arose after encountering a formation that was difficult or hazardous to drill and thus at a time when drilling operations were being conducted on a daywork basis and when the risk of loss was on the operator. The Oklahoma Court of Appeals reversed a jury verdict in favor of the contractor on the grounds that evidence of custom and usage should have been admitted on the issue of whether the operator must give notice of a shift from a footage to a daywork basis, or whether the shift is automatic and required no notice to the operator. Id. at 976-77.
645. See supra subsection II(C)(2).
646. See Appendix B, Article 13.6(a).
647. Appendix D, Article 18.6.
648. Appendix E, Article 17.7
649. See, e.g., In re Incident Aboard D/B Ocean King, 758 F.2d 1063 (5th Cir. 1985), wherein the court stated that such liability encompasses all “damages necessarily flowing from loss of the hole.” Id. at 1069.
under the drilling contract. 650

If the hole is damaged to the extent that it cannot be drilled to the contract depth, the drilling contractor, upon the request of the operator, must commence a new hole at the contractor's expense. 651 In such a case, whether or not a new hole is commenced, the drilling contractor is not entitled to any payment in connection with the abandoned hole, except daywork for which the contractor would have been compensated had the original hole not been abandoned. 652

However, the API form and the IADC footage and turnkey forms contain an important provision modifying this limitation on the drilling contractor's right to compensation. 653 The API form provides that when operations are being conducted on a footage basis, the operator must pay the contractor for work performed in drilling the lost hole if the hole is lost due to the failure of the operator's casing or equipment either during the running or cementing of such casing, or to the subsequent failure of the cementing job resulting in parted casing. 654 In such a case, the operator must also reimburse the drilling contractor for all costs incurred in attempting to restore the hole to a condition whereby further operations may be commenced, and for any costs for moving the rig to a new location in the event a substitute well must be drilled. 655 The work of drilling the replacement well is then performed under the terms and conditions of the original contract. 656

P. Force Majeure

A well-drafted drilling contract contains a force majeure clause excusing performance of the contract by both the operator and the drilling contractor in the event certain unforeseen or unavoidable situations or circumstances arise which prevent full or timely performance. 657 The

650. Appendix B, Article 11.9. See also Appendix C, Article 14.12; Appendix D, Article 18.14; Appendix E, Article 17.16.
651. See e.g., Appendix B, Article 13.6(a). See also Appendix D, Article 18.6; Appendix E, Article 17.7.
652. See Appendix B, Article 13.6(a). See also Appendix D, Article 18.6; Appendix E, Article 17.7.
653. See Appendix B, Article 13.6(b). See also Appendix D, Article 18.6; Appendix E, Article 17.7.
654. See Appendix B, Article 13.6(b). See also Appendix D, Article 18.6; Appendix E, Article 17.7.
655. See Appendix B, Article 13.6(b). See also Appendix D, Article 18.6; Appendix E, Article 17.7.
656. See Appendix B, Article 13.6(b). See also Appendix D, Article 18.6; Appendix E, Article 17.7.
657. See, e.g., Appendix B, Article 16.1.
clause provides that neither the operator nor the drilling contractor will be liable to the other for any delays or damages which might arise as a result of "causes beyond the control of the parties affected hereby," except for payment of any applicable force majeure rate. The IADC daywork and footage forms provide that a party claiming force majeure must give detailed notice of the force majeure to the other party.

As might be expected, the force majeure clause, especially the phrase "causes beyond the control of the parties affected hereby," is subject to a wide variety of interpretations and is thus ripe for litigation. In general, however, force majeure clauses are strictly construed since courts are hesitant to relieve a party of its obligations under a contract. For example, in Logan v. Blaxton, excessive rains had made the roads providing access to the lease impassable. The court refused to apply the force majeure clause although the contract defined force majeure as "'lack of labor or means of transportation of labor or material; Acts of God; insurrection; flood; strike.'" In holding that the force majeure clause had not operated to save the lease, the court stated:

"We are not impressed, from the evidence, that the rains complained of constituted a flood or floods, or that they constituted a Force Majeure or Act of God as would have prevented defendant from transporting . . . to market the oil from these leased premises . . . so as to relieve the defendant of his obligation under the . . . contract."

Accordingly, the parties to a drilling contract should not depend on making liberal use of the force majeure clause to avoid their respective contractual obligations.

Similarly, in Matador Drilling Co. v. Post, the drilling contractor was denied force majeure rates because it failed to notify the operator.

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658. Id. The force majeure rate is specified in the bid sheet/drilling order form. See, e.g., Appendix A, Article 14.2.h. This provision sets forth a day rate to be paid to the drilling contractor for any continuous period that normal operations are suspended due to conditions of force majeure. It also specifies the number of days after which either party may terminate the contract with respect to the particular well. However, the operator may maintain the contract by continued payment of the force majeure rate.

659. See Appendix C, Article 17; Appendix D, Article 22.


661. Id. at 676.

662. Id. (emphasis in original). While Logan v. Blaxton was actually a case involving a lessee's obligation to market production from a lease, the principles underlying a force majeure clause are essentially the same regardless of whether such a clause is incorporated into a lease, drilling contract, or other contract.

663. Id. at 677.

664. 662 F.2d 1190 (5th Cir. 1981).
that it was claiming force majeure as required by the contract.\textsuperscript{665} In addition, however, the court concluded that no force majeure actually existed when, in an effort to recover stuck pipe, the derrick was damaged, necessitating a twenty-four-day delay for repairs.\textsuperscript{666} In reaching this decision, the court noted that the parties had specifically addressed the issue of repairs elsewhere in the contract.\textsuperscript{667}

Q. Confidentiality of Information

Operators spend large sums of money on the formation of prospects for exploration and possible development. In an industry where the stakes are so great, operators try closely to guard drilling information. Thus, most drilling contracts contain a provision concerning confidentiality.\textsuperscript{668} Under the API form, upon the written request of the operator, the drilling contractor may not divulge drilling information to third parties.\textsuperscript{669} Under this provision the contractor also promises that its employees will not divulge any drilling information to third parties.\textsuperscript{670} As a practical matter, however, there is little a drilling contractor can do to stop the loose conversation which may occur after working hours in establishments regularly patronized by rig hands.

R. Choice of Law

While the API form does not include a choice of law provision, the IADC provisions do contain a statement of governing law.\textsuperscript{671} None of the model forms specify a choice of forum which would require any disputes to be resolved by the courts of a particular jurisdiction.

While a thorough discussion of conflict of laws is beyond the scope of this article, a statement of fundamental principles is appropriate. First, when the parties fail to designate the governing law and a contract dispute arises, the courts must first decide which state's substantive contract law governs the contract. "In a diversity case a federal court must apply the conflict-of-law rules of the state in which the court sits."\textsuperscript{672} In general, most states apply the "most significant relationship" test set

\begin{itemize}
  \item \textsuperscript{665} Id. at 1197-98.
  \item \textsuperscript{666} Id. at 1198.
  \item \textsuperscript{667} Id.
  \item \textsuperscript{668} See, e.g., Appendix B, Article 23.1.
  \item \textsuperscript{669} Id.
  \item \textsuperscript{670} Some major operators have amended this clause to make the drilling contractor a fiduciary with respect to this promise.
  \item \textsuperscript{671} See Appendix C, Article 18; Appendix D, Article 23; Appendix E, Article 17.18(a).
\end{itemize}
forth in the Second Restatement of Conflict of Laws. Specifically with regard to service contracts, such as a drilling contract, both the validity of the contract and the rights created by the contract are governed by the law of the state where the service is performed—in other words, by the law of the state where the well is drilled.

Second, the parties to a drilling contract may specifically agree that the contract is to be governed by the law of a certain state. Such a designation, in the absence of a contrary intent, means that the local law of a designated state should govern the contract, not including that state's conflict of laws principles. As between the parties, this designation will ordinarily be binding so as to fulfill the reasonable expectations of the parties. However, the parties (a) may not be allowed to choose a state that has "no substantial relationship to the parties or the transaction," or (b) may not be permitted to choose governing law which is "contrary to a fundamental policy of a state which has a materially greater interest than the chosen state in the determination of the particular issue and which . . . would be the state of the applicable law in the absence of an effective choice of law by the parties."

Problems respecting exception (a) above are rare. The choice of law will be effective if the parties choose the state of the operator's or drilling contractor's principle place of business, the state where the drilling will occur, or the state where the contract is executed, provided such location...
was not merely fortuitous.\textsuperscript{679}

Problems more commonly arise under exception (b). Where, but for the express choice of law (state $Y$) by the parties, the law of state $X$ would govern the dispute, \textit{and} where state $X$ has a fundamental policy which overrides the contract of the parties, the law of state $X$ will be applied, provided state $X$ has a materially greater interest in the outcome of the dispute than state $Y$.\textsuperscript{680} Obviously, there can be great dispute over what constitutes "fundamental policy," but one area where such a dispute commonly arises concerns the indemnifications the parties make in a contract. For example, the parties may agree that the law of state $Y$ is to govern a drilling contract which provides for the drilling of a well in state $X$. Absent this choice of law by the parties, the law of state $X$ would most likely govern.\textsuperscript{681} If the operator had agreed to indemnify the drilling contractor against the contractor's own negligence (an agreement enforceable in state $Y$ but not in state $X$), a court may nonetheless apply the law of State $X$ on the grounds of "fundamental policy." Accordingly, the parties to a drilling contract should not assume that their expressed choice of law will be honored.

Parties making a choice of law must also be careful not to confuse disputes arising in contract with disputes arising in tort. In the latter, the choice of law selected by the parties may not be controlling; this is especially true where third-party plaintiffs are concerned. In other words, parties who agree that a drilling contract is to be governed by the law of state $Y$, even though the well is to be drilled in state $X$, may nonetheless have their tortious conduct in state $X$ governed by the law of state $X$. For example, a tort action for personal injury or property damage is generally governed by the law of the state where the injury or damage occurred unless another state has a more significant relationship to the dispute.\textsuperscript{682}

Special problems arise when an injury occurs that is covered by more than one state's workers' compensation act, or for which immunity is provided the defendant by one state's act, but not provided by another state's act.\textsuperscript{683} The parties to a contract may not be able to avoid such problems with a choice of law or other contractual provision.

In general, a state may provide for extra-territorial application of its

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{679} See id. § 187 comment f.
\item \textsuperscript{680} See id. § 187 comment g.
\item \textsuperscript{681} See id. § 196 (1971).
\item \textsuperscript{682} See id. §§ 145-147 (1971).
\item \textsuperscript{683} See id. §§ 181-185.
\end{itemize}
\end{footnotesize}
workers' compensation act, either by explicit statutory provision or, more commonly, by administrative or judicial decision. Depending on the specific state law, extra-territorial application of an act may lead to awards in more than one state. However, the amount paid on a prior award is credited against the subsequent award.

A state may constitutionally provide a cause of action in tort even though the defendant is immune from suit under the provisions of an applicable workers' compensation act of another state under which the plaintiff could obtain an award against the defendant or has obtained an award against a third person. However, in general, the Second Restatement of the Conflict of Laws provides that a suit in tort should be barred if the defendant enjoys immunity and is required to provide insurance against the risk concerned under the provisions of an applicable workers' compensation act which could or has afforded the plaintiff relief. Notwithstanding such immunity, however, such a defendant may be liable for contribution or indemnification to a third person against whom a judgment has been rendered. Only this latter matter of contribution or indemnification can be effectively controlled by contractual provisions, and in some states, even this matter may be governed by rules of law that override the parties' contractual intent.

IV. CONCLUSION

The choice of form (daywork, footage, or turnkey), the risk allocation/indemnification provisions, and the technical specifications are the most important matters concerning drilling contracts. Of these, the risk allocation/indemnification provisions are critical. The most significant variations in contracts will be encountered in, and the most costly litigation is likely to arise from, these provisions. In the 1980s, operators placed more risk on drilling contractors. Accordingly, the indemnity provisions in 1980s contracts are less likely to be mutual except where required by statute. This trend is likely to change only when the demand for rigs dramatically increases.

As mentioned throughout the Article, Appendixes A through E are

684. See generally id. § 181 comment b.
685. See generally id. § 182 and comments.
686. See generally id. § 183 and comments.
687. See id. § 184.
688. See generally id. §§ 173 and comment c, 184, 187, 188.
689. Historically, liability for personal injury has been the greatest concern. Today, liability for pollution and contamination is the growing concern.
reproductions of the API and IADC model drilling contract forms. The API form is reproduced in its entirety. However, the technical exhibits to the IADC forms have been deleted to save space. To assist in understanding the model forms, the API form and the IADC footage forms have been filled out to provide for the drilling of a fictitious well in Texas. However, none of the model form provisions have been modified. Accordingly, these sample contracts are not intended to reflect current practice and may not be suitable as guides to filling out the forms for an actual well.

Finally, a brief description of the drilling process has been added as Appendix F. This summary is intended as a basic introduction to the complex business of drilling.

690. The author gratefully acknowledges the assistance of M.A. "Pete" Miller, Jr., Vice President, Helmerich & Payne International Drilling Co., Oklahoma City, Oklahoma.
EXHIBIT A
BID SHEET AND DRILLING ORDER*

Mid-America Oil & Gas Corp.
333 E. 35th
Oklahoma City, OK 33333

To: Worldwide Drilling Company

P.O. Box 555
Dallas, Texas 55555

Gentlemen:

☐ MASTER DRILLING CONTRACT (check if applicable): In accordance with provisions of the Drilling Contract dated February 5, 1990, herebefore executed by you bearing Operator's No. 456 and the further provisions hereof, we solicit your bid for the Down Work rate of the well(s) hereinafter described.

☐ SINGLE OR MULTIPLE WELL(S) DRILLING CONTRACT (check if applicable): In accordance with provisions of the Drilling Contract, form of which is attached to this Drilling Order, and the further provisions hereof, we solicit your bid for the [ ] ______ of the well(s) hereinafter described.

This Drilling Order has been filled in by us to the extent necessary to disclose the manner in which we desire the well(s) to be drilled. If you desire to submit a bid, it will be necessary that you complete this Drilling Order in every respect, and we request that you have such completed bid, properly executed by you in duplicate originals, returned to our office at 333 E. 35th, Oklahoma City, OK, with a copy to [_______], no later than 10:00 a.m., February 25, 1990. If your bid is accepted, we will return one executed original to you.

If your bid as submitted is accepted by us (Operator reserving the right to reject any and all bids), this instrument will become the Drilling Order and it together with the above identified Drilling Contract shall constitute the full and complete Agreement between us covering the work described in this Drilling Order.

Very truly yours,

Mid-America Oil & Gas Corp.
333 E. 35th, Oklahoma City, OK 33333

Operator
1. NAME AND LOCATION OF WELL:
   Well Name and No.: Lueuinghoener #2-7
   County/Parish/Borough: Duval County
   Field Name: South Burnett
   Well location and land description: Section 2-T5N-R10W

   The above is for well and contract identification only and Contractor assumes no liability whatsoever for a proper survey or location stake on Operator's lease.

   1.1 Additional Well Locations or Areas:

2. COMMENCEMENT DATE:
   2.1 Contractor agrees to use best efforts to commence operations for the drilling of the well(s) by the 5th day of March 1990 or within 21 days after the completion of the location.

   2.2 Subject to Operator's right to stop the well as outlined in the Drilling Contract, this Agreement shall remain in full force and effect until operations are completed on the well or wells specified in Section 1 for a term of ___________ commencing on the date specified in Subsection 2.1.

3. DEPTH:
   Subject to the right of Operator to direct the stoppage of work at any time (as provided in Subparagraph 6.1 of the Drilling Contract), the well shall be drilled to the measured depth of 14,700 feet.

   3.1 Footage Basis: The well shall be drilled to ___________ feet or ___________ formation, or to the depth at which the ___________ inch casing is set, whichever depth is first reached, on a footage basis and Contractor is to be paid for such drilling at the footage rate specified below, which depth is hereinafter referred to as the contract footage depth.

   3.2 Combination Footage/Daywork Basis: All drilling below the above specified contract footage depth shall be on a daywork basis as defined herein and Contractor shall be paid for such drilling at the applicable daywork rate specified herein.

   3.3 Maximum Depth: Contractor shall not be required to drill said well under the terms of this Contract below a maximum depth of 15,000 feet.

4. EQUIPMENT, MATERIALS, AND SERVICES TO BE FURNISHED BY CONTRACTOR:

The machinery, equipment, tools, materials, supplies, instruments, services, and labor hereinafter listed, including any transportation required for such items, shall be provided at the location at the expense of Contractor unless otherwise noted herein.

4.1 Drilling Rig:

Complete drilling rig designated by Contractor as Rig. No. 79, the major items of equipment being:

<table>
<thead>
<tr>
<th>Drawworks: Make, Model, and H. P.</th>
<th>National 110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engines: Make, Model, H. P., and No. of Each on Rig</td>
<td>Caterpillar D-398, 900 HP each (3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pumps: No. 1 — Make, Size, and Input Power</th>
<th>Oilwell A1000, 1100 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Operating Pressure, psi</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pumps: No. 2 — Make, Size, and Input Power</th>
<th>Oilwell A1000, 1100 HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Operating Pressure, psi</td>
<td></td>
</tr>
</tbody>
</table>

Drilling Fluid Mixing Pump: Make, Size, and Input Power 815x6

Boilers: No., Make, H. P., and Working Pressure N/A

Derrick or Mast: Make, Size, Type, and Capacity Lee C. Moore, 142', 1,000,000# API hook load capacity

Substructure: Size and Capacity 30', 1,000,000# casing; 500,000# setback

Floor Height ft, width ft, length ft

Height above base of substructure to underside of rotary beams ft

For use with a derrick or mast having nominal capacity of M lbs

Maximum pipe setback capacity M lbs

Maximum rotary table supporting capacity irrespective of setback load M lbs

Wind break on substructure yes no

Rotary Drive: Type and Size

<table>
<thead>
<tr>
<th>Drill Pipe: Various weights and grades to maintain 100,000# margin of overpull</th>
</tr>
</thead>
<tbody>
<tr>
<td>String No. 1</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Length of String, ft:</td>
</tr>
<tr>
<td>Nominal Weight, lb/ft:</td>
</tr>
<tr>
<td>Range:</td>
</tr>
<tr>
<td>Tool Joint Type:</td>
</tr>
<tr>
<td>Type Hardbanding:</td>
</tr>
<tr>
<td>Last Inspected By/Date:</td>
</tr>
<tr>
<td>Class (New, Prem., or 2)</td>
</tr>
<tr>
<td>Feet Drilled or Rotating</td>
</tr>
<tr>
<td>Hrs. Since Inspection:</td>
</tr>
<tr>
<td>Heavy Weight Drill Pipe:</td>
</tr>
<tr>
<td>Length of String, ft:</td>
</tr>
<tr>
<td>Connection Type:</td>
</tr>
</tbody>
</table>
Drill Collars:

<table>
<thead>
<tr>
<th>Size</th>
<th>Size</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Length of String, ft:

Connection Type:

Last Inspected By/Date:

Blowout Preventers:

<table>
<thead>
<tr>
<th>Nominal Size, in.</th>
<th>Bore, ID, in.</th>
<th>Series or Working Pressure</th>
<th>Make and Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-5/8&quot;</td>
<td></td>
<td>10,000#</td>
<td>CIW Type U_Dbl.</td>
</tr>
<tr>
<td>13-5/8&quot;</td>
<td></td>
<td>10,000#</td>
<td>CIW Type U_Sgl.</td>
</tr>
<tr>
<td>13-5/8&quot;</td>
<td></td>
<td>5,000#</td>
<td>Hydrill GK</td>
</tr>
</tbody>
</table>

Special Requirements:  

Closing Unit:  

Accumulator: useable gallons above psl.

Operational checks of blowout preventer equipment shall be made as follows:

Other:  

5. EQUIPMENT, MATERIALS, AND SERVICES TO BE FURNISHED BY OPERATOR:

The machinery, equipment, tools, materials, supplies, instruments, services, and labor listed as the following numbered items, including any transportation required for such items, unless otherwise specified, shall be provided at the location and at the expense of Operator:

5.1 Furnish and maintain adequate roadway and/or canal to location, right-of-way, including rights-of-way for fuel and water lines, river crossings, highway crossings, gates, and cattle guards.

5.2 Stake location, clear and grade location, and provide turnaround including surfacing when necessary.

5.3 Test tanks with pipe and fittings.

5.4 Drilling fluid storage tanks with pipe and fittings.

5.5 Separator with pipe and fittings.

5.6 Drilling fluid, chemicals, lost circulation materials, and other additives.

5.7 Special tools required while operating on daywork basis.
6. EQUIPMENT, MATERIALS, AND SERVICES TO BE FURNISHED BY DESIGNATED PARTY:

The machinery, equipment, tools, materials, supplies, instruments, services, and labor listed as the following numbered items, including any transportation required for such items, unless otherwise specified shall be provided at the location and at the expense of the party as designated by an "x" mark in the appropriate column.

<table>
<thead>
<tr>
<th>Item</th>
<th>To be Provided by:</th>
<th>To be Provided at Expense of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operator</td>
<td>Contractor</td>
</tr>
<tr>
<td>6.1</td>
<td>Bonds for public roads</td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Other required costs for public roads</td>
<td></td>
</tr>
<tr>
<td>6.3</td>
<td>Fuel (located at )</td>
<td></td>
</tr>
<tr>
<td>6.4</td>
<td>Fuel lines (length ft)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
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</tr>
<tr>
<td>6.6 Water at source including required permits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6 Water well including required permits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.7 Water lines including required permits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.8 Water storage tanks, capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.9 Labor to operate water well or water pump</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.10 Maintenance of water well, if required</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.11 Parts for engines, boilers, motors, and drilling fluid pumps</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.12 Special foundation</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.13 Collar and runways</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.14 Rigging-up materials</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.15 Derrick timbers</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6.16 Transportation of Contractor's property:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Move in</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>b. Move out</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>c. Rig up</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>d. Rig down</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.17 Erect and dismantle derrick</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6.18 Materials for enclosing rig and derrick</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6.19 Steel circulating drilling fluid pits:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. Site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.20 Reserve pits</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.21 Covered storage for drilling fluid materials and chemicals, Size</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.22 Pipe racks</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.23 Shale shaker</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.24 Desander</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.25 Centrifuge</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.26 Mud-gas separator, type</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.27 Degasser</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.28 Drilling recorder with ___ pens</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.29 Additional strings of drill pipe and drill collars other than those specified in Subsection 4.1 as follows:</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6.30 Kelly joints, subs, elevators, and slips for use with additional drill pipe strings</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.31 Drilling mouse hole and rat hole</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.32 Drilling hole for or driving conductor pipe</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6.33 Conductor pipe</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

(3)
<table>
<thead>
<tr>
<th>Item</th>
<th>To be Provided by:</th>
<th>To be Provided at Expense of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operator</td>
<td>Contractor</td>
</tr>
<tr>
<td>6.34 a. Drilling bits, footage</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.35 a. Reamers, stabilizers, reamer cutters, footage</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.36 Upper Kelly cock</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.37 Lower Kelly cock</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.38 Reel and measuring line</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.39 Conventional drift indicator</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.40 Miscellaneous drilling tools</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.41 Drill pipe protectors for each joint of drill pipe running inside of surface casing, as required for use with normal drill pipe string</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.42 Drill pipe protectors for each joint of drill pipe running inside of protection casing</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.43 Drill pipe protectors for Kelly sub</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.44 Running of casing — conductor:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Rig time</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b. Extra labor, casing tools, power tongs</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.45 Running of casing — surface:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Rig time</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b. Extra labor, casing tools, power tongs</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.46 Running of casing — protection:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Rig time</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>b. Extra labor, casing tools, power tongs</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6.47 Running of casing — production:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Rig time</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>b. Extra labor, casing tools, power tongs</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.48 Running of casing — liner:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Rig time</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>b. Extra labor, casing tools, power tongs</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>6.49 Tubing tools</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.50 Power tubing tongs</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.51 Blowout preventer testing packoff, type</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6.52 a. Fishing tool services and rentals, footage</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Contract</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>6.53</td>
<td>Conventional core barrel</td>
<td>X</td>
</tr>
<tr>
<td>6.54</td>
<td>Coring reel with wire line of sufficient length for coring at maximum depth specified in Contract</td>
<td>NA</td>
</tr>
<tr>
<td>6.55</td>
<td>Wire line core barrel</td>
<td>NA</td>
</tr>
<tr>
<td>6.56</td>
<td>Swabbing unit with swabbing line</td>
<td>X</td>
</tr>
<tr>
<td>6.57</td>
<td>Swab</td>
<td>NA</td>
</tr>
<tr>
<td>6.58</td>
<td>Swabbing lubricator</td>
<td>X</td>
</tr>
<tr>
<td>6.59</td>
<td>Swab rubbers</td>
<td>X</td>
</tr>
<tr>
<td>6.60</td>
<td>Labor to connect, disconnect, and clean drilling fluid tanks, test tanks, and separator</td>
<td>X</td>
</tr>
<tr>
<td>6.61</td>
<td>Refill and level all pits</td>
<td>NA</td>
</tr>
<tr>
<td>6.62</td>
<td>Camp facilities personnel</td>
<td>NA</td>
</tr>
<tr>
<td>6.63</td>
<td>Catering services</td>
<td>NA</td>
</tr>
<tr>
<td>6.64</td>
<td>Helicopter service</td>
<td>NA</td>
</tr>
<tr>
<td>6.65</td>
<td>Aircraft service</td>
<td>NA</td>
</tr>
<tr>
<td>6.66</td>
<td>Crew boats, No.</td>
<td>NA</td>
</tr>
<tr>
<td>6.67</td>
<td>Service barges, No.</td>
<td>NA</td>
</tr>
<tr>
<td>6.68</td>
<td>Service tug boat</td>
<td>NA</td>
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<td>6.69</td>
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<td>6.70</td>
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<td>6.87</td>
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<tr>
<td>6.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. CASING AND CEMENTING PROGRAM:

<table>
<thead>
<tr>
<th>Casing OD, in.</th>
<th>Casing Drift Dia., in.</th>
<th>Minimum Hole Dia., in.</th>
<th>Proposed Setting Depth, ft</th>
<th>Scratchers, number</th>
<th>Centralizers, number</th>
</tr>
</thead>
<tbody>
<tr>
<td>As designated by Operator</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Casing OD, in.</th>
<th>Proposed Quantity Cement</th>
<th>Wait on Cement, hrs.</th>
<th>Max. Allowable Drill Collar OD and Rotary Speed While Drilling out Casing Shoe</th>
<th>Footage, &quot;F&quot; or Daywork, &quot;D&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>As designated by Operator</td>
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<td></td>
</tr>
</tbody>
</table>

8. DRILLING FLUID PROGRAM:

<table>
<thead>
<tr>
<th>Depth Interval, ft</th>
<th>Type Drilling Fluid</th>
<th>Density, ppg</th>
<th>Water Loss, cc</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 0 to 1,000</td>
<td>Spud Mud</td>
<td>N.C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,100 to 10,500</td>
<td>Gel Water</td>
<td>N.C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,500 to 12,500</td>
<td>Low Sol/Non Disp.</td>
<td>20/10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12,500 to 14,700</td>
<td>Low Sol/Disp.</td>
<td>10/8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the event it becomes necessary to discontinue drilling operations and to suddenly raise the drilling fluid density ppg above the density currently being used or to raise the drilling fluid density at any time to ppg or more, such action is deemed to be "Abnormal Pressure" as set forth in Subsection 16.2 of this Drilling Order. Operations thereafter will go forward under the terms of Subsection 16.2 until such condition has been overcome, the well is under control, and the drilling fluid system is stabilized at a density less than ppg.

Other drilling fluid specifications: Mud Company Recommendations

9. STRAIGHT HOLE SPECIFICATIONS (DEVIATION SURVEYS):

<table>
<thead>
<tr>
<th>Well Depth, ft</th>
<th>Max. Distance Between Surveys</th>
<th>Max. Deviation from Vertical</th>
<th>Max. Change of Angle Between Any Two Surveys.</th>
</tr>
</thead>
</table>

*
<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>ft</th>
<th>degrees</th>
<th>degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3,100</td>
<td>250'</td>
<td>2°</td>
<td>1°</td>
</tr>
<tr>
<td>3,100</td>
<td>14,700</td>
<td>350'</td>
<td>3°</td>
<td>1°</td>
</tr>
</tbody>
</table>

Location of wellbore at 14,700 feet shall be no more than 200' from vertical of surface well bore.

*NOTE:*

a. Reduce proportionately for survey intervals less than 100 feet, but do not use intervals shorter than 30 feet.

b. If these limits are exceeded and the distance between surveys is more than 100 feet, Contractor shall take intermediate surveys no more than 100 feet apart. If such intermediate surveys show that the above limits for any interval have been exceeded, Contractor shall correct hole deviation to within limits of above specifications.

c. When directional surveys are required, the change of angle shall be the change of overall angle.

d. The foregoing rate of change shall not be limiting in case of operations approved by Operator.

10. PROPOSED CORING PROGRAM:

<table>
<thead>
<tr>
<th>Approx. Depth, ft</th>
<th>Formation</th>
<th>Type Core</th>
<th>Size, in.</th>
<th>Footage, ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>As required by Operator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

11. PROPOSED WIRE LINE SURVEYS:

<table>
<thead>
<tr>
<th>Type or Kind</th>
<th>From</th>
<th>To</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>At Operator's discretion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
12. PROPOSED FLUID PRODUCTION TESTS:

<table>
<thead>
<tr>
<th>Type or Kind</th>
<th>Depth, ft</th>
<th>Zone to be tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>To be determined</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. DESIGNATED REPRESENTATIVES:

<table>
<thead>
<tr>
<th>OPERATOR</th>
<th>CONTRACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-America Oil &amp; Gas Corp.</td>
<td>Worldwide Drilling Company</td>
</tr>
<tr>
<td>Mid-America Oil &amp; Gas Corp.</td>
<td>Worldwide Drilling Company</td>
</tr>
<tr>
<td>(Name)</td>
<td>(Name)</td>
</tr>
<tr>
<td>333 E. 35th</td>
<td>P.O. Box 555</td>
</tr>
<tr>
<td>(Address)</td>
<td>(Address)</td>
</tr>
<tr>
<td>Oklahoma City, OK 33333</td>
<td>Dallas, Texas 55555</td>
</tr>
<tr>
<td>(City, State, Zip Code)</td>
<td>(City, State, Zip Code)</td>
</tr>
<tr>
<td>(405) 555-1234</td>
<td>(214) 555-5678</td>
</tr>
<tr>
<td>(Day Telephone No.)</td>
<td>(Day Telephone No.)</td>
</tr>
<tr>
<td>(Night Telephone No.)</td>
<td>(Night Telephone No.)</td>
</tr>
</tbody>
</table>

14. COMPENSATION TO BE PAID CONTRACTOR:

14.1 Footage Basis. For work performed on a footage basis, the sum of $NA per foot for each linear foot of hole drilled. Such linear footage shall be determined by steel tape measurement of the drill string. Such measurement shall be calculated from top of rotary drive bushing to the total depth drilled less footage drilled while work is performed on a daywork basis.

14.2 Daywork Rates. For work performed on a daywork basis, as defined in Subparagraph 3.2 of the Drilling Contract, Contractor shall be paid as follows:

14.2a Mobilization. Operator shall pay Contractor a mobilization fee of $38,000 or a mobilization day rate of $NA per day. This sum may be invoiced at the time the rig is rigged up or positioned at the well site ready to spud. Mobilization shall include:

\[ \text{The demobilization fee} \]

14.2b Demobilization. Operator shall pay Contractor a demobilization fee of $NA or a demobilization day rate during tear down of $NA per day, provided, however, that no demobilization fee shall be payable if this Agreement is terminated due to the total loss or destruction of the rig. Demobilization shall include: the fee shall be included in the mobilization fee (14.2.a).
14.2.1 Moving Rate. During the time the rig is in transit to or from a drill site or between drill sites, Operator shall pay Contractor a sum of $\text{NA}$ per day.

14.2.2 Operating Rate. For work performed with a full crew, Contractor shall be paid a rate for each twenty-four (24) hour day as follows:

<table>
<thead>
<tr>
<th>Depth Intervals, ft</th>
<th>With Drill Pipe</th>
<th>Without Drill Pipe</th>
<th>Using Operator's Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 0</td>
<td>$4,500</td>
<td>$4,500</td>
<td>$4,500</td>
</tr>
<tr>
<td>To TD</td>
<td>$4,500</td>
<td>$4,500</td>
<td>$4,500</td>
</tr>
</tbody>
</table>

14.2.3 Standby Rate. For standby time while waiting on orders or equipment to be furnished by Operator, a standby rate of $4,500 per twenty-four (24) hour day with full crew or $3,000 per twenty-four (24) hour day guard only.

14.2.4 Rig Crew. A full crew shall consist of 5 members for each tour of duty. For each member the crew is short, Contractor's day rate may be reduced by up to five (5) times the daily rate of pay, including payroll burden, of such missing crew members, if in the opinion of Operator the efficiency of operations is reduced.

14.2.5 Repair Rate. In the event it is necessary to shut down Contractor's rig for repairs to surface equipment, excluding routine rig servicing and maintenance, while Contractor is performing daywork hereunder, Contractor shall be allowed compensation at the applicable daywork rate for each period of shutdown time up to a maximum of 4 hours for any repair job and a total of 12 hours for each thirty (30) day period. Thereafter, Contractor shall be compensated at a rate of $0 per twenty-four (24) hour day. Such routine rig servicing and maintenance, including but not limited to, cutting and slitting the drilling line, lubricating the rig, repacking the swivel, and changing the pump liners, shall not be included in computing the number of hours of shutdown rig time.

14.2.6 Force Majeure Rate. $4,500 per twenty-four (24) hour day for any continuous period that normal operations are suspended or cannot be carried on due to conditions of force majeure as defined in Paragraph 16 of the Drilling Contract. After 30 days either party may elect to terminate this Drilling Order or Operator may maintain this Drilling Order, in effect by continued payment of the force majeure rate.

14.3 If a well is drilled on a footage basis and Operator elects to plug and abandon the hole, Contractor agrees to furnish $\text{NA}$ hours of rig time without charge in lieu of rig time required to set casing as included in the footage rate.

14.4 The rates and/or payments set forth herein shall be adjusted upward or downward to reflect the changes in cost if such costs of any of the items hereinafter listed shall vary by more than $5\%$ percent of the cost on the date of this Drilling Order or by the same percent after the date of any revision pursuant to this Subsection:

a. Direct rig labor and supervision costs, including all benefits connected therewith, of Contractor's personnel;

b. Contractor's cost of insurance premiums;

c. Contractor's cost of fuel, the cost per gallon/MBF being $0.70;

d. Contractor's cost of catering, when applicable;

e. If Operator requires Contractor to increase or decrease the number of Contractor's personnel;

f. Contractor's cost of spare parts and supplies with the understanding that such spare parts and supplies constitute $5\%$ percent of the operating rate and that the parties shall use the U.S. Bureau of Labor Statistics Oilfield Drilling Machinery and Equipment Wholesale Price Index (Code No. 1191-02) to determine to what extent a price variance has occurred in said spare parts and supplies;

g. If there is any change in legislation or regulations in the area in which Contractor is working that alters Contractor's financial burden.
14.5 Contractor shall provide written notification to Operator if rates are to be adjusted pursuant to Subsection 14.4 including the basis for any cost increases or decreases. Said notification shall be given at least ten (10) days in advance of any billing from Contractor to Operator.

14.6 Normal wear and tear excepted, Operator agrees to reimburse Contractor for in-hole equipment damaged or lost in the hole while on a daywork basis (refer to Subparagraph 13.4 of the Drilling Contract). The basis for reimbursement will be the current repair cost or ______ percent (____%) of the current new replacement cost of such equipment delivered to the well site.

16. EARLY TERMINATION COMPENSATION:

16.A By Operator — Footage Basis

16.A.1 Prior to Commencement. In the event Operator terminates this Agreement prior to commencement of operations hereunder, Operator shall pay Contractor, as liquidated damages and not as a penalty, a lump sum of $________.

16.A.2 Prior to Spudding. If work stoppage occurs after commencement of operations but prior to spudding of the well, Operator shall pay to Contractor the sum of the following: 1) all expenses reasonably and necessarily incurred by Contractor by reason of the premature stoppage of work, excluding, however, expenses of normal drilling crew and supervision, 2) ten percent (10%) of the amount of such reimbursable expenses, and 3) a sum calculated at the applicable standby rate for all time from the date on which Contractor commences any operations hereunder through such date that Contractor has reasonable time to dismantle his rig and equipment. provided, however, if this Agreement is for a term of more than one well, Operator shall pay Contractor, in addition to the above, as liquidated damages and not as a penalty, a lump sum of $________, or

16.A.3 Subsequent to Spudding. If such work stoppage occurs after spudding of the well, Operator shall pay the Contractor, at the time of the work stoppage, the amounts calculated under the footage rate, applicable daywork rate, and applicable standby rate. Operator shall also pay Contractor for all expenses reasonably and necessarily incurred by Contractor by reason of the Agreement and by reason of the premature stoppage of work plus the sum of $________, provided, however, if this Agreement is for a term of more than one well, Operator shall pay Contractor, in addition to the above, as liquidated damages and not as a penalty, a lump sum of $________, or

16.B By Operator — Daywork Basis

16.B.1 Prior to Commencement. In the event Operator terminates this Agreement prior to commencement of operations hereunder, Operator shall pay Contractor, as liquidated damages and not as a penalty, a lump sum of $________.

16.B.2 Prior to Spudding. If such termination occurs after commencement of operations but prior to the spudding of the well, Operator shall pay to the Contractor the sum of the following: 1) all expenses reasonably and necessarily incurred by Contractor by reason of the Agreement and by reason of the premature stoppage of the work, excluding the expense of drilling or other crew members and supervision directly assigned to the rig, 2) ten percent (10%) of the amount of such reimbursable expenses, and 3) a sum calculated at the applicable standby rate for all time from the date on which Contractor commences any operations hereunder through such date that Contractor has reasonable time to dismantle his rig and equipment, provided, however, if this Agreement is for a term of more than one well or for a period of time, Operator shall pay Contractor, in addition to the above, the applicable standby rate from the date Contractor completes dismantling his rig and equipment until the end of the term, or
15.B.3 Subsequent to Spudding. If such termination occurs after spudding of the well, Operator shall pay Contractor the amount for all applicable daywork rates and all other charges and reimbursements due to Contractor; but in no event shall such sum, exclusive of reimbursements due, be less than would have been earned for 0 days at the applicable daywork rate "without drill pipe" (Subsection 14.2.4) and the actual amount due for all drill pipe used in accordance with the above rates or at the election of Contractor and in lieu of the foregoing, Operator shall pay Contractor for all expenses reasonably and necessarily incurred by reason of this Agreement and by reason of such premature termination plus a lump sum of $0, provided, however, if this Agreement is for a term of more than one well or for a period of time, Operator shall pay Contractor, in addition to the above, the applicable stand-by rate from the date of termination until the end of the term, or

15.C By Contractor.
15.C.1 In the event Contractor fails to commence operations in accordance with the terms hereof and terminates this Agreement, Contractor shall pay to Operator, as liquidated damages and not as a penalty, the sum of $0.

16. SPECIAL AGREEMENTS:
16.1 Lost Circulation. In the event loss of circulation or partial loss of circulation is encountered, Contractor shall, without undue delay, exert every reasonable effort to overcome such difficulty. When such condition is encountered, Operator shall assume risk of loss or damage to the hole and to Contractor's equipment in the hole. Should such condition persist in spite of Contractor's efforts to overcome it, then after a period of 0 hours consumed in such efforts, further operations shall be conducted on daywork basis at the applicable daywork rate until such condition has been overcome and normal drilling operations can be resumed. The total rig time to be furnished by Contractor under the terms of this Subsection shall be limited to 0 hours cumulative. The footage drilled while on daywork basis shall be deducted from the footage used in calculating charges under the footage rate.

16.2 Abnormal Pressure or Special Drilling Problems. In the event water flow, domal, steeply dipping or faulted formation, abnormal pressure, underground mine or cavern, heaving formation, salt, or other condition is encountered which makes drilling abnormally difficult or hazardous, causes sticking of drill pipe or casing, or other difficulty which precludes drilling ahead under reasonably normal procedures, Contractor shall, in all cases, without undue delay, exert every reasonable effort to overcome such difficulty. When such condition is encountered, further operations shall be conducted on a daywork basis at the applicable daywork rate until such conditions have been overcome and normal drilling operations can be resumed. Operator shall assume the risk of loss or damage to the hole and to Contractor's equipment in the hole from the time such condition is encountered. The footage drilled while on a daywork basis shall be deducted from the footage used in calculating charges under the footage rate.

16.3 Formations Difficult or Hazardous to Drill. In the event chert, pyrite, quartzite, granite, igneous rock, or other impenetrable substance is encountered while drilling on footage basis and the footage drilled during each twenty-four (24) hour period multiplied by the footage rate does not equal the applicable daywork rate plus cost of bits, all drilling operations shall be conducted on a daywork basis at the applicable daywork rate, with Operator furnishing bits, until normal drilling operations and procedures can be resumed. The footage drilled on a daywork rate shall be deducted from the footage used in calculating charges under the footage rate.

17. OTHER PROVISIONS:
17. OTHER PROVISIONS (CONTINUED):

18. ACCEPTANCE OF DRILLING ORDER:

18.1 Subject to rig availability and all terms and conditions hereof, the foregoing Drilling Order is accepted by the undersigned as Contractor this 10th day of February 1980, which shall be the effective date of this Agreement. It is understood that said Drilling Order shall not be binding upon Operator until Operator has noted its acceptance by signature hereon. It is further understood that unless said Drilling Order is executed by Operator within 15 days of the above date, the Contractor shall in no manner be bound by its signature hereon.

Contractor:  Worldwide Drilling Company

By:  

TULSA LAW JOURNAL
18.2 The foregoing Drilling Order is agreed to and accepted by Operator this ___ of ______, 19___.

Operator: Mid-America Oil & Gas Corp.

By: ____________________________

Title: ____________________________
DRILLING CONTRACT

Operator's Number

THIS MASTER ☐ — SINGLE/MULTIPLE WELL(S) ☐ DRILLING CONTRACT ("Drilling Contract") made and entered into by and between ___________________________________

between __________________________________________

hereinafter called Operator, and __________________________________________

hereinafter called Contractor.

WITNESSETH THAT,

WHEREAS, Operator is the owner, part owner, and/or Operator of certain properties on which it may from time to time desire to have a well or wells drilled and completed in search of oil, gas, or geothermal fluids and,

WHEREAS, Contractor is engaged in the business of drilling and completing such wells and represents that it has adequate equipment meeting specifications stated herein and in good working order and trained personnel capable of efficiently operating such equipment with which it desires to drill and complete such well or wells according to provisions hereof; it being expressly understood and agreed by Operator and Contractor that services performed hereunder by Contractor are on either a "footage" or "daywork" basis, as subsequently defined and designated.

NOW, THEREFORE, the parties hereto, each in consideration of the promises and agreements of the other, mutually agree as follows:

1. AGREEMENT:

1.1 If at any time during the term of this Drilling Contract Operator desires to have a well or wells drilled and completed by Contractor. Operator shall prepare and submit to Contractor a "Bid Sheet and Drilling Order," as the form of Exhibit A attached hereto, incorporated herein, and hereinafter referred to as "Drilling Order." Such Drilling Order shall designate whether operations are to be conducted on footage or daywork basis and set forth the location, the depth to be drilled, specifications, and other conditions under which the well or wells are to be drilled and completed. If Contractor desires to drill and complete for Operator the well or wells set forth in the Drilling Order under the terms of this Drilling Contract and conditions and specifications set forth in the Drilling Order, Contractor shall complete the Drilling Order, setting forth the prices it proposes to charge for its services, and properly execute the Drilling Order in duplicate originals and return same to Operator. If Operator is satisfied with Contractor's proposal, Operator shall execute the Drilling Order and return one duplicate original to Contractor. When a Drilling Order has been agreed to and executed in the manner hereinabove provided, such Drilling Order shall become a part of this Drilling Contract (said documents being hereinafter collectively referred to as the "Agreement") and said Agreement shall govern and control the drilling and completing of any well or wells provided for therein by Contractor for Operator. When used as a Master Drilling Contract, execution of this Drilling Contract alone does not obligate Operator or Contractor to enter into any Drilling Order, one with the other.

1.2 If and when a Drilling Order has been executed by the parties hereto, Contractor agrees to commence operations for drilling of the well as set forth in the Drilling Order, and to drill and complete the well covered thereby in accordance with all of the provisions and specifications of this Agreement.
2. LABOR, EQUIPMENT, MATERIALS, SUPPLIES, AND SERVICES:

2.1 Contractor shall furnish equipment, materials, and services as specifically designated to be furnished by Contractor in Sections 4 and 6 of the Drilling Order.

2.2 All labor, equipment, materials, supplies, and services necessary for the proper operation or maintenance of the drilling rig shall be furnished by Contractor. Additional materials, equipment, special tools, supplies, and services necessary or proper for the drilling and completion of the well shall be furnished at the drill site by the party designated in Sections 4, 5, and 6 of the Drilling Order. Should tools, materials, apparatus, or services, other than those set forth herein or designated in the Drilling Order, be necessary for the drilling or completion of the well, the cost of such tools, materials, apparatus, or services and the manner in which they are to be furnished shall be agreed upon by the parties hereto.

2.3 Operator is responsible for determining location of the well and will stake the location and will furnish such labor, equipment, materials, supplies, and services as specifically designated to be furnished by Operator in Sections 5 and 6 of the Drilling Order.

2.4 Should Contractor purchase for Operator at Operator's request any materials, supplies, or equipment which Operator is obligated to furnish under terms of this Agreement, Operator agrees to pay Contractor within thirty (30) days after date of receipt of Contractor's invoice the actual cost plus ten percent (10%) of such materials, supplies, or equipment. Contractor agrees to furnish Operator copies of suppliers', vendors', or third party invoices covering such materials, supplies, or equipment.

3. BASIS OF COMPENSATION:

3.1 Subject to all of the other provisions hereof, Operator agrees to pay Contractor for the work performed and services rendered by Contractor in accordance with Section 14 of the Drilling Order.

3.2 The term "daywork" shall be defined as, and apply to, the work performed by Contractor at direction of Operator (which term is deemed to include any employee, agent, consultant, or subcontractor engaged by Operator to direct drilling operations) at a stipulated rate per day as distinguished from work for which Contractor is compensated at a stipulated rate per foot of hole drilled. For purposes hereof and subject to Paragraph 14 of the Drilling Contract, the term "daywork basis" means Contractor shall furnish equipment and labor and perform services as herein provided, for a specified sum per day. When operating on a daywork basis, Contractor shall be fully paid at the applicable rates of payment and for all the obligations and liabilities stated herein. Except for liabilities and obligations specifically assumed by Contractor, Operator shall be solely responsible and assumes liability for all consequences of operations by both parties while on a daywork basis, including results and all other risks or liabilities incurred or incident to such operations. When work is performed on a daywork basis, provisions of this Agreement applicable to drilling on a footage basis shall not apply.

3.3 For purposes hereof, the term "footage basis" means Contractor shall furnish the equipment and labor and perform services as herein provided to drill a well or wells to the contract footage depth specified to earn and be paid at the stipulated rate per foot of hole drilled. While drilling on a footage basis, Contractor shall direct, supervise, and control drilling operations and assumes certain liabilities to the extent specifically provided for herein. For work performed on a footage basis, Contractor's compensation shall be calculated by multiplying the rate agreed upon by linear footage of hole drilled. Such linear footage of hole drilled shall be determined in the manner specified in the Drilling Order. Notwithstanding the above provisions, while drilling on a footage basis, the following work shall nevertheless be performed on a daywork basis:

a. All drilling below the contract footage depth, as provided in Subsection 3.1 of the Drilling Order, including the setting of any string of casing below such depth;

b. All work performed by the Contractor, whether or not prior to reaching the contract footage depth, in an effort to restore the hole to such condition that further drilling or other operations may be conducted when the hole has been lost or damaged as a result of failure of Operator's casing or equipment, either during or after the running and setting of such casing, or as a result of failure of the cementing job resulting in parted casing;

c. When conditions set forth in Paragraph 16 of the Drilling Contract or Section 16 of the Drilling Order occur;

d. All other work performed by Contractor at the request of Operator, regardless of depth, which work is not within the scope of work to be performed on footage basis, including, but not limited to, all control logging, core, photogrammetry, logging, acid treatment, shooting, cleaning out, hydraulic fracturing, plugging, running tubing, setting liners, squeeze cementing, well abandonment, and wellhead equipment installation operations.

3.4 In determining the amount of daywork time for which Contractor is to be compensated when drilling on a footage basis, it is agreed that such daywork time shall begin when Contractor, in accordance with terms hereof, suspends normal footage drilling operations and shall include the time required to restore the hole to the same drilling conditions which existed when operations on a footage basis were suspended. For daywork comprising less than a twenty-four (24) hour day, Contractor shall be paid the proper fractional part thereof to the nearest half hour at the applicable rate.

4. TIME OF PAYMENT:

4.1 Subject to and conditioned upon full and complete compliance with all of the terms and conditions of this Agreement, Operator agrees to make payments to Contractor as stipulated herein.

4.3 Payment for work performed on a footage basis shall be due and payable when Contractor completes performance of all footage work provided for by this Agreement and the acceptance thereof by Operator. If Contractor performs any daywork prior to reaching the contract footage depth, or thereafter, such daywork shall be invoiced at the close of each calendar month or upon completion of the well.

4.4 If the entire hole is drilled on a footage basis, such work is performed at daywork rates set forth in Subsection 14.2 of the Drilling Order. Such invoices shall be submitted at the close of each calendar month and on completion of the well.

4.5 Should Operator fail to make payment within thirty (30) days after receipt of Contractor's invoices, the unpaid balance shall bear interest monthly at the rate of twelve percent (12%) per annum or the maximum interest rate permitted by the applicable laws of the jurisdiction in which the well is located, whichever is the lesser.

4.6 If this Agreement is placed in the hands of an attorney for collection of any sums due hereunder, or suit is brought on same, or sums due hereunder are collected through bankruptcy or probate proceedings, then Operator and Contractor agree that there shall be added to the amount due reasonable attorney's fees and costs.

5. STOPPAGE OF WORK:

5.1 By Operator. Notwithstanding the provisions of Section 3 of the Drilling Order with respect to the depth to be drilled, Operator shall have the right to stoppage of the work to be performed by Contractor hereunder at any time prior to reaching the specified depth, even though Contractor has made no default hereunder, and in such event Operator shall be under no obligation to Contractor except as set forth in Section 15 of the Drilling Order.

5.2 By Contractor. Notwithstanding the provisions of Section 3 of the Drilling Order with respect to the depth to be drilled, the event Operator shall become insolvent, or be adjudicated as bankrupt, or file by way of petitions or answers a debtor's petition or other pleading seeking adjustment of Operator's debts under any bankruptcy or debtor's relief laws now or hereafter prevailing, or if any such be filed against Operator, or if a receiver be appointed of the Operator or Operator's property or any part thereof, or Operator's affairs be placed in the hands of a Creditor's Committee, or if Operator should fail to pay invoices within ninety (90) days of receipt of Contractor's invoice, Contractor may, at its option, elect to terminate any further performance of any work under this Agreement and Contractor's right to compensation shall be as prescribed in Section 15 of the Drilling Order. In addition to Contractor's right to terminate performance hereunder, Operator expressly agrees to protect, indemnify, and save Contractor harmless for any claims, demands, and causes of action, including all costs of defense in favor of Operator, Operator's joint venturers, or other parties arising out of any drilling commitments or obligations contained in any lease, farmout agreement, or other agreement, which may be affected by such termination of performance under this Agreement.

6. OPTIONAL RIGHT OF OPERATOR IN EVENT OF DEFAULT BY CONTRACTOR:

6.1 In the event of unreasonably slow progress, carelessness, inattention, or incompetency on the part of Contractor in performance of the work, Operator shall notify Contractor of its dissatisfaction. Contractor shall be afforded a reasonable period of time to correct or remedy the matters complained of. Should Contractor, within the time afforded by Operator, fail to correct or remedy the matters complained of to Operator's satisfaction, Operator shall have the right to take possession of the well, discontinue the drilling thereof, or abandon same. If Operator so elects, it may, in its discretion, use the well or all of Contractor's machinery and equipment at the well site and, through its own employees or some other contractor, drill such well to completion. However, if at the time of such notice there should be danger of a blowout or other well hazards be imminent, Operator shall have the right to immediately take over the operations and either discontinue, abandon, or continue drilling as above provided. If Operator takes over the well and Contractor's machinery, and equipment and completes the well, Operator's cost in completing the well, with no allowance for use of Contractor's tools, machinery, and equipment, shall be deducted from the contract price which otherwise would have been payable to Contractor, and the balance, if any, paid to Contractor. If operations are being conducted on a footage basis and Operator causes the well to be abandoned prior to reaching contract footage depth, terms of Subsection 15.5 of the Drilling Order shall be applicable. Operator shall return tools, machinery, and equipment to Contractor in as good condition as when taken over, normal wear and tear, excepted. If operations are taken over by Operator as herein provided, all operations thereafter performed shall be at Operator's risk and the indemnity provisions hereof shall not apply. If Contractor carries insurance on Contractor's tools, machinery, and equipment, such insurance shall be continued in effect during the period of such takeover, subject to approval by insurer, and Operator shall reimburse Contractor for the cost of such insurance during such period. If Operator should elect, or, if insurer refuses to continue coverage, Operator shall secure such insurance through some other source, or assume the risk as a self-insurer.

7. CASING PROGRAM:

7.1 The casing program shall be provided in Section 7 of the Drilling Order. The exact setting depth of each string of casing, the amount of cement, and the process to be used in cementing shall be specified by the Operator at the time of each casing setting. Should Operator modify the casing program as provided in Section 7 of the Drilling Order and should such modification materially increase Contractor's costs of performing its obligations herein, Operator shall compensate Contractor for such additional costs as mutually agreed or revert to daywork basis if on footage basis.

7.2 Contractor shall run and cement all strings of casing and shall be compensated therefor either at footage rates or at daywork rates as set out in the Drilling Order.

7.3 Contractor agrees to keep thread protectors on the casing until it is taken from the rocks to be run into the hole and to apply a suitable pipe thread lubricant as it is made up. Contractor further agrees to preserve all protectors and after the well is completed to reinstall said protectors on any casing remaining on location.
8. DRILLING METHODS AND PRACTICES:

8.1 Without relieving Operator from its obligations assumed in this Agreement, Contractor agrees to perform all work to be conducted by him under the terms of the Drilling Contract and the specifications and conditions set forth in the Drilling Order with due diligence and care, in a good workmanlike manner, and in accordance with good drilling practices. Contractor's failure to perform as provided in this Paragraph shall not relieve Operator of its obligation to pay Contractor for all work performed through completion or termination of this Agreement.

8.2 Contractor agrees to maintain well control equipment in good operating condition at all times, checking as prescribed in Section 4 of the Drilling Order, and shall use all reasonable means to control and prevent fires and blowouts, protect the hole, and protect Operator's equipment.

8.3 Contractor agrees to maintain the drilling fluid program in a manner satisfactory to Operator. The drilling fluid shall be maintained in accordance with specifications set forth in Section 6 of the Drilling Order. If Operator furnishes drilling fluid and drilling fluid conditions, Operator shall control specifications and use of these materials. Should Operator modify the drilling fluid program as set forth in Section 8 of the Drilling Order and should such modification materially increase Contractor's costs and risks as mutually agreed or revert to daywork basis. Should no drilling fluid program be specified by Operator in the Drilling Order, Contractor shall have the right to determine the type and character of the drilling fluid program during the time Contractor is performing work on a footage basis under the terms of the Agreement.

8.4 Contractor agrees to promptly notify Operator when any oil- and/or gas-bearing formation is found and follow any instructions stipulated in the Drilling Order. Operator shall be afforded sufficient time to examine said formation to determine whether or not the well should be completed in same, and for such time consumed Contractor shall be paid applicable daywork rates if on a daywork basis.

8.5 Contractor agrees to furnish equipment, personnel, and instruments acceptable to Operator and to make deviation surveys as provided in the Drilling Order. Unless operations are on a daywork basis, all such deviation surveys shall be made at Contractor's sole risk, cost, and expense. If in the opinion of Operator, it becomes advisable to obtain the use of an additional deviation survey instrument and accessory equipment for the purpose of either checking previous readings or of determining the direction of the drift, the rental charges therefor shall be paid by Operator and the running of same shall be on a daywork basis. Should the hole at any depth during the time Contractor is performing work on a footage basis have either a deviation from vertical or a change in overall angle in excess of the limits prescribed in Section 9 of the Drilling Order, Contractor agrees to restore the hole to a condition suitable to Operator either by conventional methods and procedures while drilling ahead or by cementing off and redrilling. While operations are being performed on a daywork basis, Contractor agrees to exercise due diligence and care to maintain the straight hole specifications. If any, set forth in the Drilling Order, all risk and expense of maintaining such specifications or restoring the hole to a condition suitable to Operator shall be assumed by Operator.

9. CORINGs AND CUTTINGS:

9.1 Contractor agrees to take cores as set out in Section 10 of the Drilling Order.

9.2 Contractor agrees to save and label samples of such formation as Operator may request.

10. REPORTS TO BE FURNISHED BY CONTRACTOR:

10.1 Contractor shall keep and furnish to Operator a daily drilling report showing depth of hole, formations penetrated, and such other data as required by Operator. Unless Operator specifies a drilling report form, the standard API-IADC Daily Drilling Report Form shall be used.

10.2 Contractor shall report to Operator, as soon as practicable, all accidents or occurrences resulting in injuries to Contractor's employees or third parties, or damage to property of third parties, arising out of or during the course of operations of Contractor or of any subcontractors of Contractor, and shall furnish Operator with a copy of all reports made by Contractor to Contractor's insurer or to others of such accidents and occurrences.

10.3 Delivery tickets covering any materials or supplies delivered to location by Operator or furnished by vendors for which Operator is obligated to reimburse Contractor, shall be kept, in as received condition, with the daily drilling report. The quantity, description, and condition of materials and supplies so furnished shall be verified and checked by Contractor, and such delivery shall be properly certified to receipt by Contractor's representative.

11. INSURANCE AND INDEMNITY:

11.1 Without limiting the indemnity obligations or liabilities of Contractor or its insurers, at any and all times during the term of this Agreement, Contractor agrees to carry insurance of the types and in minimum amounts as follows: (NOTE: Inserted amounts, if any, prevail over printed amounts):

a. Workmen's Compensation insurance in full compliance with all applicable state and Federal laws and regulations.

b. Employer’s Liability insurance with minimum limits of $50,000,000 per occurrence covering injury or death to any employee which may or may not be covered by the state Workmen’s Compensation statute of the state in which the work is performed.

c. Comprehensive General Liability insurance, including contractual liability coverage, with minimum limits of $500,000 or $ per occurrence for personal injury or death together with minimum limits of $200,000 or $ per occurrence for property damage.
d. Automobile Liability insurance covering owned, non-owned, and hired automobile equipment with minimum limits of $500,000 or
$200,000 per occurrence for personal injury or death together with minimum limits of
$500,000 or $200,000 per occurrence for property damage.

e. See Certificate of Insurance, attached to and herein incorporated by reference.

f.

g. All such insurance shall be carried by Contractor at Contractor's expense with an insurance company or companies authorized to do
business in the state where work is to be performed and satisfactory to Operator. Contractor shall procure from the company or companies
writing said insurance a certificate or certificates satisfactory to the Operator that said insurance is in full force and effect and that the same
shall not be cancelled or materially changed without ten (10) days prior written notice to Operator. For liabilities assumed hereunder
by Contractor, its insurance shall be endorsed to provide that the underwriters waive subrogation against Operator. Operator will, as well,
cause its insurer to waive subrogation against Contractor for liabilities it assumes.

11.2 In the event Contractor is a self-insurer and Operator has consented to Contractor being a self-insurer as to one or more of the risks
as to which coverage is herein required, evidence of such consent must be in writing and approved by a representative of Operator authorized to
enter into such consent agreement.

11.3 Contractor agrees to protect, defend, indemnify, and save Operator, its joint owners' and their respective officers, directors, and
employees harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to
the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Operator's employees or
Contractor's subcontractors or their employees, on account of bodily injury, death, or damage to property. If it is judicially determined that the
monetary limits of insurance required hereunder or of the indemnities voluntarily and mutually assumed under Subparagraph 11.3 (which
Contractor and Operator hereby agree will be supported either by available liability insurance, under which the insurer has no right of
subrogation against the indemnitees, or voluntarily self-insured in part or whole) exceed the maximum limits permitted under applicable law, it is
agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted
under such law.

11.4 Operator agrees to protect, defend, indemnify, and save Contractor and its officers, directors, employees and joint owners harmless from
and against any loss, damage, expense, claim, fine and penalty, demand, or liability for pollution or contamination, including control and removal
thereof, originating on or above the surface of the land or water from spills, leaks, or discharges of fuel, lubricants, motor oils, pipe dope, paints,
solvents, ballast, bilge, sludge, garbage, or any other liquid or solid whatsoever in possession and control of Contractor and without regard to
negligence of any party or parties.

11.5 Contractor shall assume full responsibility for and shall defend, indemnify, and hold Operator and its joint owners harmless from and
against any loss, damage, expense, claim, fine and penalty, demand, or liability for pollution or contamination, including control and removal
thereof, originating on or above the surface of the land or water from spills, leaks, or discharges of fuel, lubricants, motor oils, pipe dope, paints,
solvents, ballast, bilge, sludge, garbage, or any other liquid or solid whatsoever in possession and control of Contractor and without regard to
negligence of any party or parties.

11.6 Operator shall assume full responsibility for and shall defend, indemnify, and hold Contractor harmless from and against any loss,
damage, expense, claim, fine and penalty, demand, or liability for pollution or contamination, including control and removal thereof, arising out
c or connected with services performed at Operator's location by Contractor hereunder, and not assumed by Contractor in Subparagraph 11.5,
including but not limited to that which may result from well fire, blowout, casing shear-off, or any other uncontrolled flow of oil, gas, water, or
other substance except to the extent such loss, damages, expense, claim, fine and penalty, demand, or liability may be covered by Contractor's
insurance, and without regard to negligence of any party or parties.

11.7 Initiation of cleanup operations by either party shall not be an admission or assumption of liability by such initiating party or parties.

11.8 Operator agrees to defend and indemnify Contractor for any and all claims against Contractor resulting from operations under this
Agreement on account of injury to, destruction of, or loss or impairment of any property right in or tool, gas, or other mineral substance or water
if, at the time of the act or omission causing such injury, destruction, loss or impairment, said substance had not been reduced to physical
possession above the surface of the earth and for any loss or damage to any formation, strata, or reservoir beneath the surface of the earth.

11.9 Neither party shall be liable to the other for special, indirect, or consequential damages resulting from or arising out of this Agreement,
including, without limitation, loss of profit or business interruptions, however same may be caused, except as set forth in Section 15 of the Drilling
Order.
12. TAXES AND CLAIMS:

12.1 Contractor agrees to pay all taxes, licenses, and fees levied or assessed on Contractor in connection with or incident to the performance of this Agreement by any governmental agency for unemployment compensation insurance, old age benefits, social security, or any other taxes upon wages (salaries) paid by Contractor, its agents, employees, and representatives. Contractor agrees to require the same agreements and be liable for any breach of such agreements by any of its subcontractors.

12.2 Contractor agrees to reimburse Operator on demand for all such taxes or governmental charges, state or Federal, which Operator may be required or deemed it necessary to pay on account of employees of Contractor or its subcontractors. Contractor agrees to furnish Operator with the information required to enable it to make the necessary reports and to pay such taxes or charges. At its election, Operator is authorized to deduct all sums so paid for such taxes and governmental charges from such amounts as may be or become due to Contractor hereunder.

12.3 Contractor agrees to pay all claims for labor, materials, services, and supplies furnished by Contractor hereunder and agrees to allow no lien or charge to be fixed upon the lease, the well, the land on which the well is to be drilled, or other property of Operator. Contractor agrees to indemnify, protect, and hold Operator harmless from and against all such claims and liens. If Contractor shall fail or refuse to pay any claims or indebtedness incurred by Contractor in connection with the drilling of any well or wells hereunder, it is agreed that Operator shall have the right to pay any such claim or indebtedness out of any money due or to become due to Contractor hereunder. No assignment or transfer by Contractor of rights to monies due Contractor hereunder shall have any force or effect as far as Operator's rights are concerned until all such claims and indebtedness incurred by Contractor shall have been completely liquidated and discharged.

12.4 Before payments are made by Operator to Contractor, Operator may require Contractor to furnish proof that there are no unsatisfied claims for labor, materials, equipment, and supplies, or for injuries to persons or property not covered by insurance.

13. RESPONSIBILITY FOR LOSS OR DAMAGE TO THE EQUIPMENT OR THE HOLE:

13.1 Contractor's Surface Equipment. Contractor shall assume liability at all times, regardless of whether work is being performed on a footage basis or a daywork basis, for damage to or destruction of Contractor's equipment while it is on the surface, including but not limited to all drilling tools, machinery, and appliances for use above the surface, regardless of when or how such damage or destruction occurs and Operator shall be under no liability to reimburse Contractor for any such loss except:

a. If Operator fails to prepare a sound surface location, adequate in size and capable of properly supporting the drilling rig such as a location over preexisting subsurface conditions or obstructions (including but not limited to mines, caverns, sink holes, streams, pipelines, power lines, telephone lines) which Contractor might encounter during operations (including move-in) hereunder, which conditions or obstructions cause a loss or damage to the rig or its associated equipment, Operator shall reimburse Contractor to the extent not covered by Contractor's insurance, such reimbursement not to exceed $100,000, for all such loss or damage. In addition, Operator shall pay Contractor during periods of work stoppage or related repair at applicable rates set forth in Section 14 of the Drilling Order, for a period not to exceed thirty (30) days.

b. If Contractor's surface equipment is damaged or lost by reason of exposure to highly corrosive or otherwise destructive environment, including but not limited to hydrogen sulfide emissions from the well, Operator shall reimburse Contractor to the extent not covered by Contractor's insurance for all such loss or damage. In addition, Operator shall pay Contractor during periods of work stoppage or repair at applicable rates as set forth in Section 14 of the Drilling Order, for a period not to exceed thirty (30) days.

13.2 Contractor's In-hole Equipment — Environmental Loss or Damage. Operator shall assume liability at all times, to the extent not covered by Contractor's insurance including any deductible, for damage to or destruction of Contractor's in-hole equipment caused by exposure to highly corrosive or otherwise destructive elements, including those introduced into the drilling fluid.

13.3 Contractor's In-hole Equipment — Footage Basis. Contractor shall assume liability at all times while work is being performed on a footage basis for loss of, damage to, or destruction of Contractor's in-hole equipment, including but not limited to drill pipe, drill collar, and tool joints, and Operator shall be under no liability to reimburse Contractor for any such loss except as provided in Subparagraph 13.2 above and Subsections 16.1, 16.2, and 16.3 of the Drilling Order.

13.4 Contractor's In-hole Equipment — Daywork Basis. Operator agrees to reimburse Contractor, to the extent not covered by Contractor's insurance including any deductible, for Contractor's tools and equipment lost or damaged in the hole while Contractor is working on daywork rates. The basis for reimbursement shall be as specified in Subsection 14.6 of the Drilling Order. Operator agrees to compensate Contractor as mutually agreed for fatigue damage due to dog leg severity or rapid change of hole angles, deviation, or direction, unless the dogleg was created while Contractor was drilling on a footage basis.

13.5 Operator's Equipment. Operator shall assume liability at all times for damage to or destruction of Operator's equipment, including but not limited to casing, tubing, and wellhead equipment and Contractor shall be under no liability to reimburse Operator for any such loss or damage.

13.6 The Hole — Footage Basis. (a) Subject to the provisions of Subsections 16.1, 16.2, and 16.3 of the Drilling Order and Subparagraph 13.1 hereof, should a fire or blowout occur or should the hole be lost or damaged while Contractor is performing work hereunder on a footage basis, all such loss or damage shall be borne by Contractor; and if the hole cannot be drilled to the contract depth, as provided in the Agreement, Contractor shall, if requested by Operator, commence a new hole without delay at Contractor's cost. Drilling of such new hole shall be at terms and conditions of this Agreement. In such case, whether or not a new hole has commenced, Contractor shall not be entitled to any payment or compensation for expenditures made or incurred in connection with the abandoned hole, except daywork for which Contractor would have been compensated had such hole not been abandoned.
18. AUDITS:
18.1 If any payment provided for hereunder is made on the basis of Contractor's costs, Operator shall have the right to audit Contractor's books and records relating to such costs. Contractor agrees to maintain such books and records for a period of two (2) years from the date such costs were incurred and to make such books and records available to Operator at any time or times within the two-year period.
19. PATENTS:
19.1 For equipment, materials, and processes supplied by each party hereto in connection with work under this Agreement, the supplying party shall indemnify and hold the other party hereto harmless from any and all claims, costs, damages, settlements, and the like for patent infringement or trade secret misappropriation based on such equipment, materials, or processes.

20. CONFLICTS:
20.1 In the event there is a conflict between provisions of the Drilling Contract and any papers or documents, other than the Drilling Order, which may have been executed or passed between the parties hereto in connection with the subject matter hereof, it is understood and agreed that the provisions of the Drilling Contract shall be controlling. If there is a conflict between the provisions of the Drilling Contract and a Drilling Order executed in connection herewith, it is understood and agreed that the provisions of the Drilling Order shall be controlling.

21. ASSIGNMENTS:
21.1 Operator and Contractor agree not to assign this Agreement, any of the work required hereunder, or any work stipulated in the Drilling Order, except for work normally performed by subcontractors, and not to assign any sums that may accrue to Contractor hereunder without prior written consent of the other party. If any assignment by Operator is made that materially alters Contractor's financial burden, Contractor's compensation shall be adjusted to give effect to any change in Contractor's operating costs.

22. NO WAIVER EXCEPT IN WRITING:
22.1 It is fully understood and agreed that none of the requirements of this Agreement shall be considered as waived by either party unless the same is done in writing, and then only by the persons executing this Agreement or other duly authorized agent or representative of the party.

23. INFORMATION CONFIDENTIAL:
23.1 Upon written request by Operator, information obtained by Contractor in the conduct of drilling operations on this well, including but not limited to depth, formations penetrated, and the results of coring, testing, and surveying, shall be considered confidential and shall not be divulged by Contractor or its employees to any persons, firm, or corporation other than Operator's designated representative.

24. TERM:
24.1 If used as a Master Drilling Contract, this Drilling Contract, effective as of the date first hereinafter written, shall remain in effect for a period of one (1) year and thereafter until cancelled by Operator or Contractor by giving written notice to the other. If used for a single well or wells, the term hereof shall be as specified in the Drilling Order.

WITNESS the signatures of the parties hereto in DUPLICATE ORIGINALS, this 5th day of February, 19_80_.

Mid-America Oil & Gas Corp.
(Operator)

By: __________________________

Worldwide Drilling Company
(Contractor)

By: __________________________
EXHIBIT B
GOVERNMENT REGULATIONS
(Refer to Paragraph 15, Model Form 4C1,

The following clauses, where applicable, are incorporated in the Agreement by reference as if fully set out:

(1) The Equal Opportunity Clause prescribed in 41 CFR 60-1.4.
CERTIFICATE OF INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES LISTED BELOW.

Name and Address of Insured
Worldwide Drilling Company
P.O. Box 555
Dallas, TX 75255

This is to certify that policies listed herein have been issued to the insured named herein and are in force at this time. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies.

CANCELLATION: Should any of the herein described policies be cancelled before the expiration date thereof, the issuing company will endeavor to mail 30 days written notice to the herein named certificate holder, but failure to mail such notice shall impose no obligation or liability of any kind upon the company.

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Company and Policy Number</th>
<th>Policy Term</th>
<th>Limits of Liability in Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Each Occurrence</td>
</tr>
<tr>
<td>GENERAL LIABILITY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N Comprehensive Form</td>
<td>National Union Fire Ins. Co. of Pittsburgh, PA GLA 459 6948</td>
<td>09-30-88 to 10-15-89</td>
<td>Bodily Injury</td>
</tr>
<tr>
<td>N Complimentary Form</td>
<td>National Union Fire Ins. Co. of Pittsburgh, PA BA 1459090 (except TX) BATX 1459079 (TX)</td>
<td>09-30-88 to 10-15-89</td>
<td>Bodily Injury</td>
</tr>
<tr>
<td>N Personal Injury</td>
<td>National Union Fire Ins. Co. of Pittsburgh, PA BA 1459090 (except TX) BATX 1459079 (TX)</td>
<td>09-30-88 to 10-15-89</td>
<td>Bodily Injury and Property Damage Combined</td>
</tr>
<tr>
<td>AUTOMOBILE LIABILITY</td>
<td>Lloyd's of London and Companies NA906-103</td>
<td>08-31-89/90</td>
<td>Bodily Injury and Property Damage Combined</td>
</tr>
<tr>
<td>N Comprehensive Form</td>
<td>Lloyd's of London and Companies NA906-103</td>
<td>08-31-89/90</td>
<td>Bodily Injury and Property Damage Combined</td>
</tr>
<tr>
<td>WERS COMPENSATION AND EMPLOYERS' LIABILITY</td>
<td>National Union Fire Ins. Co. of Pittsburgh, PA WC 1126499 (Land)</td>
<td>10-15-89</td>
<td>STATUTORY</td>
</tr>
<tr>
<td>WEXCESS LIABILITY</td>
<td>Lloyd's of London and Companies NA906-103</td>
<td>09-30-88 to 10-15-89</td>
<td>$1,000, Each Occ/$1,000 Agg</td>
</tr>
</tbody>
</table>

CGL: Includes non-operating working interests as additional insureds.
WC: Includes coverage for USLH, Outer Continental Shelf Act, Maritime, Jones Act, All States Endorsement and Voluntary WC Endorsement.

Policies contain blanket waiver of subrogation and provision for additional insured where required by contract.

Date: January 10, 1990

By: J.J. Schmidt

DRILLING CONTRACTS
INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS

DRILLING BID PROPOSAL
AND
DAYWORK DRILLING CONTRACT — U.S.

TO: _______________________________________________________
___________________________________________________________
___________________________________________________________

Please submit bid on this drilling contract form for performing the work outlined below, upon the terms and for the consideration set forth, with the understanding that if the bid is accepted by

this instrument will constitute a contract between us. Your bid should be mailed or delivered not later than _______ P.M. on

___________________________________________________________

the following address:

___________________________________________________________

* * * * * * *

THIS AGREEMENT, (The "Contract") made and entered into on the date hereinafter set forth by and between the parties herein designated as "Operator" and "Contractor":

OPERATOR: ______________________________________________
Address: __________________________________________________
___________________________________________________________

CONTRACTOR: ____________________________________________
Address: __________________________________________________

IN CONSIDERATION of the mutual promises, conditions and agreements herein contained and the specifications and special provisions set forth in Exhibit "A" and Exhibit "B" attached hereto and made a part hereof, Operator engages Contractor as an Independent Contractor to drill the hereinafter designated well or wells in search of oil or gas on a daywork basis.

For purposes hereof the term "daywork basis" means Contractor shall furnish equipment, labor, and perform services as herein provided, for a specified sum per day under the direction, supervision and control of Operator (which term is deemed to include any employee, agent, consultant or subcontractor engaged by Operator to direct drilling operations). When operating on a daywork basis, Contractor shall be fully paid at the applicable rates of payment and assumes only the obligations and liabilities stated herein. Except for such obligations and liabilities specifically assumed by Contractor, Operator shall be solely responsible and assumes liability for all consequences of operations by both parties while on a daywork basis, including results and all other risks or liabilities incurred in or incident to such operations.
1. LOCATION OF WELL:
   Well Name and Number: ________________________________
   Parish: _____________________ State: ________________
   County: ___________________ Field: _________________
   Well location and land description: ________________________________

1.1 Additional Well Locations or Areas: ________________________________

Locations described above are for well and Contract Identification only and Contractor assumes no liability whatsoever for a proper survey or location stake on Operator's lease.

2. COMMENCEMENT DATE:
   Contractor agrees to use reasonable efforts to commence operations for the drilling of well by the __________ day of __________, 19________ or _________________.

3. DEPTH:
   3.1 Well Depth: The well(s) shall be drilled to a depth of approximately ________________ feet, or to the ________________, whichever is deeper, but the Contractor shall not be required hereunder to drill said well(s) below a maximum depth of ________________ feet, unless Contractor and Operator mutually agree to drill to a greater depth.

4. DAYWORK RATES:
   Contractor shall be paid at the following rates for the work performed hereunder.
   4.1 Mobilization: Operator shall pay Contractor a mobilization fee of $______________ or a mobilization day rate of $______________ per day. This sum shall be due and payable in full at the time the rig is rigged up or positioned at the well site ready to spud. Mobilization shall include:

   4.2 Demobilization: Operator shall pay Contractor a demobilization fee of $______________ or a demobilization day rate during tear down of $______________ per day, provided however that no demobilization fee shall be payable if the Contract is terminated due to the total loss or destruction of the rig. Demobilization shall include:

   4.3 Moving Rate: During the time the rig is in transit to or from a drill site, or between drill sites, commencing on __________, Operator shall pay Contractor a sum of $______________ per twenty-four (24) hour day.

   4.4 Operating Day Rate: For work performed per twenty-four (24) hour day with __________ man crew the operating day rate shall be:

<table>
<thead>
<tr>
<th>Depth Intervals</th>
<th>Without Drill Pipe</th>
<th>With Drill Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>To</td>
<td>$______________ per day</td>
</tr>
<tr>
<td>$______________</td>
<td>$______________</td>
<td>$______________ per day</td>
</tr>
<tr>
<td>$______________</td>
<td>$______________</td>
<td>$______________ per day</td>
</tr>
</tbody>
</table>

   Using Operator's drill pipe $______________ per day.

(Daywork Contract — Page 1)
If under the above column “With Drill Pipe” no day rates are specified, the daywork rate per twenty-four hour day when drill pipe is in use shall be the applicable daywork rate specified in the column “Without Drill Pipe” plus compensation for any drill pipe actually used at the rates specified below, computed on the basis of the maximum drill pipe in use at any time during each twenty-four day.

**DRILL PIPE RATES PER 24-HOUR DAY**

<table>
<thead>
<tr>
<th>Straight Hole</th>
<th>Size</th>
<th>Grade</th>
<th>Directional or Uncontrollable Deviated Hole</th>
<th>Size</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>$_____________ per ft.</td>
<td>_________</td>
<td>______</td>
<td>$_____________ per ft.</td>
<td>_______</td>
<td>______</td>
</tr>
<tr>
<td>$_____________ per ft.</td>
<td>_________</td>
<td>______</td>
<td>$_____________ per ft.</td>
<td>_______</td>
<td>______</td>
</tr>
<tr>
<td>$_____________ per ft.</td>
<td>_________</td>
<td>______</td>
<td>$_____________ per ft.</td>
<td>_______</td>
<td>______</td>
</tr>
</tbody>
</table>

Drill pipe shall be considered in use not only when in actual use but also while it is being picked up or laid down. When drill pipe is standing in the derrick, it shall not be considered in use, provided, however, that if Contractor furnishes special strings of drill pipe, drill collar, and handling tools as provided for in Exhibit “A”, the same shall be considered in use at all times when on location or until released by Operator. In no event shall fractions of an hour be considered in computing the amount of time drill pipe is in use but such time shall be computed to the nearest hour, with thirty minutes or more being considered a full hour and less than thirty minutes not to be counted.

Operating rate will begin when the drilling unit is rigged up at the drilling location, or positioned over the location during marine work, and ready to commence operations; and will cease when the rig is ready to be moved off the location.

4.5 Repair Rate: In the event it is necessary to shut down Contractor’s rig for repairs, excluding routine rig servicing, while Contractor is performing daywork hereunder, Contractor shall be allowed compensation at the applicable daywork rate for each period of shutdown time up to a maximum of __________ hours for any one repair job and a total of __________ hours for each thirty (30) day period. Thereafter, Contractor shall be compensated at a rate of $_____________ per twenty-four (24) hour day.

4.6 Standby Time Rate with Crews: $_____________ per twenty-four (24) hour day. Standby time shall be defined to include time when the rig is shut down although in readiness to begin or resume operations but Contractor is waiting on orders of Operator or on materials, services or other items to be furnished by Operator.

4.7 Force Majeure Rate: $_____________ per twenty-four (24) hour day for any continuous period that normal operations are suspended or cannot be carried on due to conditions of force majeure as defined in Paragraph 17 hereof. If, however, understood that subject to Paragraph 6.3 below, Operator can release the rig in accordance with Operator’s right to direct stoppage of the work, effective when conditions will permit the rig to be moved from the location.

4.8 Reimbursable Costs: Operator shall reimburse Contractor for the costs of material, equipment, work or services which are to be furnished by Operator as provided for herein but which for convenience are actually furnished by Contractor at Operator’s request, plus __________ percent for such cost of handling.

4.9 Revision in Rates: The rates and/or payments herein set forth due to Contractor from Operator shall be revised to reflect the change in costs if the costs of any of the items hereinafter listed shall vary by more than __________ percent from the costs thereof on the date of this Contract or by the same percent after the date of any revision pursuant to this paragraph

(a) Labor costs, including all benefits, of Contractor’s personnel,
(b) Contractor’s cost of insurance premiums,
(c) Contractor’s cost of fuel, the cost per gallon/MCF being __________, 
(d) Contractor’s cost of catering, when applicable,
(e) If Operator requires Contractor to increase or decrease the number of Contractor’s personnel,
(f) Contractor’s cost of spare parts and supplies with the understanding that such spare parts and supplies constitute __________ percent of the Operating Rate and that the parties shall use the U.S. Bureau of Labor Statistics Oilfield Drilling Machinery and Equipment Wholesale Price Index (Code No. 1191-02) to determine to what extent a price variance has occurred in said spare parts and supplies.
(g) If there is any change in legislation or regulations in the area in which Contractor is working or other unforeseen, unusual event that alters Contractor’s financial burden

5. TIME OF PAYMENT:

Payment is due by Operator to Contractor as follows
5.1 Payment for mobilization, drilling and other work performed at applicable day rates, and all other applicable charges shall be due, upon presentation of invoice therefor upon completion of mobilization, completion of the well or at the end of the month in which such work was performed or other charges are incurred, whichever shall first occur. All invoices may be mailed to Operator at address hereinafter shown, unless Operator does hereby designate that such invoices shall be mailed as follows:

5.2 Disputed Invoices and Late Payment: Operator shall pay all invoices within days after receipt except that if Operator disputes an invoice or any part thereof, Operator shall, within fifteen days after receipt of the invoice, notify Contractor of the item disputed, specifying the reason therefor, and payment of the disputed sum may be withheld until settlement of the dispute, but timely payment shall be made of any undisputed portion. Any sums including amounts ultimately paid with respect to a disputed invoice not paid within the above specified days shall bear interest at the rate of percent or the maximum legal rate, whichever is less, per month from the due date until paid. If Operator does not pay undisputed items within the above stated time, Contractor may terminate this Contract as provided under subparagraph 5.3.

5.3 Attorney’s Fees: If this Contract is placed in the hands of an attorney for collection of any sums due hereunder, or suit is brought on same, or sums due hereunder are collected through bankruptcy or probate proceedings, then Operator agrees that there shall be added to the amount due reasonable attorney’s fees and costs.

6. TERM:

6.1 Duration of Contract: This Contract shall remain in full force and effect until drilling operations are completed on the well or wells specified in Paragraph 1 above, or for a term of , commencing on the date specified in Paragraph 2 above.

6.2 Extension of Term: Operator may extend the term of this Contract for well(s) or for a period of by giving notice to Contractor at least days prior to completion of the well then being drilled or by

6.3 Early Termination:

(a) By Either Party: Upon giving of written notice, either party may terminate this Contract when total loss or destruction of the rig, or a major breakdown with indefinite repair time necessitate stopping operations hereunder.

(b) By Operator: Notwithstanding the provisions of Paragraph 3 with respect to the depth to be drilled, Operator shall have the right to direct the stoppage of the work to be performed by Contractor hereunder at any time prior to reaching the specified depth, and even though Contractor has made no default hereunder. In such event Operator shall reimburse Contractor as set forth in subparagraph 6.4 hereof.

(c) By Contractor: Notwithstanding the provision of Paragraph 3 with respect to the depth to be drilled, in the event Operator shall become insolvent, or be adjudicated a bankrupt, or file, by way of petition or answer, a claimant’s petition or other pleading seeking adjustment of Operator’s debts under any bankruptcy or debtor’s relief laws now or hereafter prevailing, or if any such be filed against Operator, or in case a receiver be appointed of Operator or Operator’s property, or any part thereof, or Operator’s affairs be placed in the hands of a Creditor’s Committee, or, following ten days prior written notice to Operator if Operator does not pay Contractor within the time specified in subparagraph 5.2, all undisputed items due and owing, Contractor may, at his option, elect to terminate further performance of any work under this Contract and Contractor’s right to compensation shall be as set forth in subparagraph 6.4 hereof. In addition to Contractor’s right to terminate performance hereunder, Operator hereby expressly agrees to protect, indemnify and save Contractor harmless from any claims, demands and causes of action, including all costs of defense, in favor of Operator, Operator’s joint venturers, or other parties arising out of any drilling commitments or obligations contained in any lease, farmout agreement or other agreement, which may be affected by such termination of performance hereunder.

6.4 Early Termination Compensation:

(a) Prior to Commencement: In the event Operator terminates this Contract prior to commencement of operations hereunder, Operator shall pay Contractor as liquidated damages and not as a penalty a sum equal to the Standby Rate of Crews (Article 4.3) for a period of days or a lump sum of $.

(b) Prior to Spudding: If such termination occurs after commencement of operations but prior to the spudding of the well, Operator shall pay Contractor the sum of the following: (1) all expenses reasonably and necessarily incurred and to be incurred by Contractor by reason of the Contract and by reason of the premature termination of the work, including the expense of drilling or other crew members and supervision directly assigned to the rig. (2) Ten percent (10%) of the amount of such reimbursable expenses, and (3) a sum calculated at the standy for all time from the date upon which Contractor commences any operations hereunder down to such date subsequent to the date of termination as will afford Contractor reasonable time to dismantle
his rig and equipment provided however, if this Contract is for a term of more than one well or for a period of time, Operator shall pay Contractor, in addition to the above, the force majeure rate less any unnecessary labor from that date subsequent to termination upon which Contractor completes dismantling his rig and equipment until the end of the term of

e. If such termination occurs after the spudding of the well, Operator shall pay Contractor (f) the amount for all applicable daywork rates and all other charges and disbursements due to Contractor; but in no event shall such sum, exclusive of reimbursement due, be less than would have been earned for __________ days at the applicable day work rate "Without Drill Pipe" and the actual amount due for drill pipe used in accordance with the above rates; or if any party hereon agrees to comply with all laws, rules, and regulations of any federal, state or local governmental authority which are now or may be applicable to that party's operations, the performance of said work shall continue in full force and effect.

7. CASING PROGRAM:
Contractor shall drill a well sufficient in size to set, at the approximate depths indicated, the size casing specified in the casing program provisions of Exhibit "A". Operator shall have the right to designate the points at which casing will be set and the manner of cementing and testing. Operator may modify the casing program, however, any such modification which materially increases Contractor's hazards or costs can only be made by mutual consent of Operator and Contractor and upon agreement as to the additional compensation to be paid Contractor as a result thereof.

8. DRILLING METHODS AND PRACTICES:
8.1 Contractor shall maintain well control equipment in good condition at all times and shall use all reasonable means to control and prevent fires and blowouts and to protect the hole.
8.2 Subject to the terms hereof, and at Operator's cost, at all times during the drilling of the well, Operator shall have the right to control the mud program, and the drilling fluid must be of a type and have characteristics and be maintained by Contractor in accordance with the specifications shown in Exhibit "A".
8.3 Each party hereon agrees to comply with all laws, rules, and regulations of any federal, state or local governmental authority which are now or may be applicable to that party's operations covered by or arising out of the performance of this Contract. The terms of Exhibit B shall apply to this Contract. In the event any provision of this Contract is inconsistent with or contrary to any applicable federal, state or local law, rule or regulation, said provision shall be deemed to be modified to the extent required to comply with said law, rule or regulation, and as so modified said provision and this Contract shall continue in full force and effect.
8.4 Contractor shall keep and furnish to Operator an accurate record of the work performed and formations drilled on the IADC-API Daily Drilling Report Form or other form acceptable to Operator. A legible copy of said form signed by Contractor's representative shall be furnished by Contractor to Operator.
8.5 If requested by Operator, Contractor shall furnish Operator with copy of delivery tickets covering any material or supplies provided by Operator and received by Contractor.

9. INGRESS, EGRESS, AND LOCATION:
Operator hereby assigns to Contractor all necessary rights of ingress and egress with respect to the tract on which the well is to be located for the performance of Contractor of all work contemplated by this Contract. Should Contractor be denied free access to the location for any reason not reasonably within Contractor's control, any time lost by Contractor as a result of such denial shall be paid for at the applicable rate. Operator shall reimburse Contractor for all amounts reasonably expended by Contractor for repairs and/or reinforcement of public roads, bridges and related or similar facilities required as a direct result of a rig move pursuant to performance hereunder.

10. SOUND LOCATION:
Operator shall prepare a sound location adequate in size and capable of properly supporting the drilling rig, and shall be responsible for a conductor pipe program adequate to prevent soil and sub-soil wash out. It is recognized that Operator has superior knowledge of the location and access routes to the location, and must advise Contractor of any subsurface conditions, or obstructions (including, but not limited to, mines, caverns, sink holes, streams, pipelines, power lines and telephone lines) which Contractor might encounter while enroute to the location or during operations hereunder. In the event such subsurface conditions cause a cratering or shifting of the location surface, or if subsurface conditions prove unsatisfactory to properly support the rig during
marine operations hereunder, and loss or damage to the rig or its associated equipment results therefrom. Operator shall, without regard to other provisions of this contract, including Paragraph 14.1 hereof, reimburse Contractor to the extent not covered by Contractor's insurance, for all such loss or damage including payment of force majeure rate during repair and/or demobilization if applicable.

11. EQUIPMENT CAPACITY:

If applicable hereunder, operations shall not be attempted where canal or water depths are in excess of __________________________ feet, or under any other conditions which exceed the capacity of the equipment specified to be used hereunder. Contractor shall make final decision as to when an operation or attempted operation would exceed the capacity of specified equipment.

12. TERMINATION OF LOCATION LIABILITY:

When Contractor has complied with all obligations of the contract regarding restoration of Operator's location, Operator shall thereafter be liable for damage to property, personal injury or death of any person which occurs as result of conditions of the location and Contractor shall be relieved of such liability; provided, however, if Contractor shall subsequently reenter upon the location for any reason, including removal of the rig, any term of the contract relating to such reentry activity shall become applicable during such period.

13. INSURANCE:

During the life of this contract, Contractor shall at Contractor's expenses maintain, with an insurance company or companies authorized to do business in the state where the work is to be performed or through a self-insurance program, insurance coverages of the kind and in the amounts set forth in Exhibit "A." Contractor shall, if requested to do so by Operator, procure from the company or companies writing said insurance a certificate or certificates that said insurance is in full force and effect and that the same shall not be cancelled or materially changed without due notification to Operator. For liabilities assumed hereunder by Contractor, its insurance shall be endorsed to provide that the underwriters waive their right of subrogation against Operator. Operator will, as well, cause its insurer to waive subrogation against Contractor for liability it assumes.

14. RESPONSIBILITY FOR LOSS OR DAMAGE:

14.1 Contractor's Surface Equipment: Contractor shall assume liability at all times, for damage to or destruction of Contractor's surface equipment, including but not limited to all drilling tools, machinery, and appliances for use above the surface, regardless of when or how such damage or destruction occurs, and Operator shall be under no liability to reimburse Contractor for any such loss except loss or damage under the provisions of Paragraphs 10 or 14.2.

14.2 Contractor's In-Hole Equipment: Operator shall assume liability at all times for damage to or destruction of Contractor's in-hole equipment, including but not limited to, drill pipe, drill collars, and tool joints, and Operator shall reimburse Contractor for the value of any such loss or damage; the value to be determined by agreement between Contractor and Operator as current repair cost or _______ percent of current new replacement cost of such equipment delivered to the well site.

14.3 Contractor's Equipment - Environmental Loss or Damage: Notwithstanding the provisions of Paragraph 14.1 above, Operator shall assume liability at all times for damage to or destruction of Contractor's equipment caused by exposure to highly corrosive or otherwise destructive elements, including those introduced into the drilling fluid.

14.4 Operator's Equipment: Operator shall assume liability at all times for damage to or destruction of Operator's equipment, including but not limited to casing, tubing, wellhead equipment, and platform if applicable, and Contractor shall be under no liability to reimburse Operator for any such loss or damage.

14.5 The Hole: In the event the hole should be lost or damaged, Operator shall be solely responsible for such damage to or loss of the hole, including the casing therein.

14.6 Underground Damage: Operator agrees to defend and indemnify Contractor for all claims against Contractor resulting from operations under this contract on account of injury to, destruction of, or loss or impairment of any property right in or to oil, gas, or other mineral substance or water, if at the time of the act or omission causing such injury, destruction, loss, or impairment, said substance had been reduced to physical possession above the surface of the earth, and for any loss or damage to any formation, strata, or reservoir beneath the surface of the earth.

14.7 Inspection of Materials Furnished by Operator: Contractor agrees to visually inspect all materials furnished by Operator before using same and to notify Operator of any apparent defects therein. Contractor shall not be liable for any loss or damage resulting from the use of materials furnished by Operator.

14.8 Contractor's Indemnification of Operator: Contractor agrees to protect, defend, indemnify, and save Operator, its officers, directors, employees and joint owners harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Contractor's employees or Contractor's subcontractors or their employees, or Contractor's invitees, on account of bodily injury, death or damage to property. If it is judicially determined that the monetary limits of insurance required hereunder or of the indemnities voluntarily and mutually assumed under paragraph 14.8 (which Contractor and Operator hereby agree will be supported either by available

(Daywork Contract — Page 3)
liability Insurance, under which the insured has no right of subrogation against the indemnities, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

14.9 Operator’s Indemnification of Contractor: Operator agrees to protect, defend, indemnify, and save Contractor, its officers, directors, employees and jointly owners harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Operator’s employees or Operator’s contractors or their employees, or Operator’s invitees, other than those parties identified in paragraph 14.8 on account of bodily injury, death or damage to property. If it is judicially determined that the monetary limits of Insurance required hereunder or of the indemnities voluntarily and mutually assumed under paragraph 14.8 (which Contractor and Operator hereby agree will be supported by available liability Insurance, under which the insured has no right of subrogation against the indemnitee, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

14.10 Liability for Wild Well: Operator shall be liable for the cost of regaining control of any wild well, as well as for cost of removal of any debris, and shall indemnify Contractor in this regard.

14.11 Pollution and Contamination: Notwithstanding anything to the contrary contained herein, except the provisions of Paragraphs 10 and 12, it is understood and agreed by and between Contractor and Operator that the responsibility for pollution and contamination shall be as follows:

(a) Unless otherwise provided herein, Contractor shall assume all responsibility for, including control and removal of, and protect, defend and save harmless Operator from and against all claims, demands and causes of action of every kind and character arising from pollution or contamination, which originates above the surface of the land or water from spills of fuels, lubricants, motor oils, normal water base drilling fluids, pipe dope, paints, solvents, ballast, bilge and garbage, except unavoidable pollution from reserve pits, wholly in Contractor’s possession and control and directly associated with Contractor’s equipment and facilities.

(b) Operator shall assume all responsibility for, including control and removal of, and protect, defend, indemnify and save Contractor harmless from, and against all claims, demands, and causes of action of every kind and character arising directly or indirectly, to all other pollution or contamination which may occur during the conduct of operations hereunder, including but not limited to, that which may result from fire, blowout, cratering, seepage or any other uncontrolled flow of oil, gas, water or other substance, as well as the use or disposition of oil emulsion, oil base or chemically treated drilling fluids, contaminated cuttings or savings, lost circulation and fish recovery materials and fluids.

(c) In the event a third party commits an act or omission which results in pollution or contamination for which either Contractor or Operator, for whom such party is performing work, is held to be legally liable, the responsibility therefor shall be considered, as between Contractor and Operator, to be the same as if the party for whom the work was performed had performed the same and all of the obligations respecting defense, indemnity, holding harmless and limitation of responsibility and liability, as set forth in (a) and (b) above, shall be specifically applied.

14.12 Consequential Damages: Neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of this Contract, including, without limitation, loss of profit or business interruptions, however same may be caused.

14.13 Indemnity Obligation: Except as otherwise expressly limited herein, it is the intent of parties hereto that all indemnity obligations and/or liabilities assumed by such parties under terms of this Contract, including, without limitation, paragraphs 14.1 through 14.12 hereto, be without limit and without regard to the cause or causes thereof (including pre-existing conditions), the unseaworthiness of any vessel or vessels, strict liability, or the negligence of any party or parties, whether such negligence be sole, joint or concurrent, active or passive. The terms and provisions of paragraphs 14.1 through 14.12 shall have no application to acts or causes of action asserted against Operator or Contractor by reason of any agreement of indemnity with a person or entity not a party hereto.

15. AUDITS:
If any payment provided for hereunder is made on the basis of Contractor’s costs, Operator shall have the right to audit Contractor’s books and records relating to such costs. Contractor agrees to maintain such books and records for a period of two (2) years from the date such costs were incurred and to make such books and records available to Operator at any reasonable time or times within the period.

16. NO WAIVER EXCEPT IN WRITING:
It is understood and agreed that none of the requirements of this Contract shall be considered as waived by either party unless the same is done in writing, and then only by the persons executing this Contract, or their duly authorized agent or representative of the party.

17. FORCE MAJEURE:
Neither Operator nor Contractor shall be liable to the other for any delays or damage or any failure to act due, occasioned or caused by reason of any laws, rules, regulations or orders promulgated by any Federal, State, or Local governmental body or the rules, regulations, or orders of any public body or official purporting to exercise authority or control respecting the operations covered hereby, including the procurement or use of tools and equipment, or
due, occasioned or caused by strikes, action of the elements, water conditions, inability to obtain fuel or other critical materials, or other causes beyond the control of the party affected thereby. In the event that either party hereto is rendered unable, wholly or in part, by any of these causes to carry out its obligation under this Contract, it is agreed that such party shall give notice and details of Force Majeure in writing to the other party as promptly as possible after its occurrence. In such cases, the obligations of the party giving the notice shall be suspended during the continuance of any inability so caused except that Operator shall be obligated to pay to Contractor the Force Majeure Rate provided for in Paragraph 4.7 above.

19. INFORMATION CONFIDENTIAL:
Upon written request by Operator, information obtained by Contractor in the conduct of drilling operations on this well, including, but not limited to, depth, formations penetrated, the results of coring, testing, and surveying, shall be considered confidential and shall not be divulged by Contractor or its employees, to any person, firm, or corporation other than Operator's designated representatives.

20. SUBCONTRACTS BY OPERATOR:
Operator may employ other contractors to perform any of the operations or services to be provided or performed by it according to Exhibit "A".

21. ASSIGNMENT:
Neither party may assign this Contract without the prior written consent of the other, and prompt notice of any such intent to assign shall be given to the other party. In the event of such assignment, the assigning party shall remain liable to the other party as a guarantor of the performance by the assignee of the terms of this Contract. If any assignment to made that materially alters Contractor's financial burden, Contractor's compensation shall be adjusted to give effect to any increase or decrease in Contractor's operating costs.

22. NOTICES AND PLACE OF PAYMENT:
All notices to be given with respect to this Contract unless otherwise provided for shall be given to the Contractor and to the Operator respectively at the addresses hereinafore shown. All sums payable hereunder to Contractor shall be payable at his address hereinabove shown unless otherwise specified herein.

23. SPECIAL PROVISIONS:

24. ACCEPTANCE OF CONTRACT:
The foregoing Contract is agreed to and accepted by Operator this day of , 19

OPERATOR:
By
Title

The foregoing Contract is accepted by the undersigned as Contractor this day of , 19 which is effective date of this agreement, subject to rig availability, and subject to all of its terms and provisions, with the understanding that unless said Contract is thus executed by Operator within days of the above date, Contractor shall be in no manner bound by its signature thereto.

CONTRACTOR:
By
Title

(Daywork Contract — Page 4)
INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS
DRILLING BID PROPOSAL
AND
FOOTAGE DRILLING CONTRACT — U.S.

TO: Worldwide Drilling Company
     P. O. Box 555
     Dallas, Texas 55555
     Attn: Mr. John Smithy

Please submit bid on this drilling contract form for performing the work outlined below, upon the terms and for the consideration set forth, with the understanding that if the bid is accepted by

this instrument will constitute a contract between us. Your bid should be mailed or delivered not later than 1:00 P.M. on February 25, 1980, to the following address:

OPERATOR: Mid-America Oil & Gas Corp.
            333 E. 35th
            Oklahoma City, OK 33333

CONTRACTOR: Worldwide Drilling Company
             P. O. Box 555
             Dallas, Texas 55555

IN CONSIDERATION of the mutual promises, conditions and agreements herein contained and the specifications and special provisions set forth in Exhibit "A" and Exhibit "B" attached hereto and made a part hereof, Operator engages Contractor as an Independent Contractor to drill the hereinafter designated well in search of oil or gas on a footage basis.

For purposes hereof the term "footage basis" means Contractor shall furnish the equipment, labor, and perform services as herein provided to drill a well, as specified by Operator, to the contract footage depth. Subject to terms and conditions hereof, payment to Contractor at a stipulated price per foot of hole drilled is earned upon attaining such contract footage depth or other specified objective. While drilling on a footage basis Contractor shall direct, supervise and control drilling operations and assumes certain liabilities to the extent specifically provided for herein. Notwithstanding that this is a footage basis contract, Contractor and Operator recognize that certain portions of the operations as hereinafter designated, both above and below contract footage depth, will be performed on a daywork basis. For purposes hereof the term "daywork basis" means Contractor shall furnish equipment, labor, and perform services as herein provided, for a specified sum per day under the direction, supervision and control of Operator (which term is deemed to include any
employee, agent, consultant, or subcontractor engaged by Operator to carry out operations, when operating on a daywork basis, Contractor shall be fully paid at the applicable rates of payment and assumes only the obligations and liabilities stated herein as being applicable during daywork operations. Except for such obligations and liabilities specifically assumed by Contractor, Operator shall be solely responsible and assumes liability for all consequences of operations by both parties while on a daywork basis, including results and all other risks or liabilities incurred in or incident to such operations.

1. LOCATION OF WELL:

Well Name: Lueninghoener #2-7
Parish: Duval
County: State: Texas
Field: South Burnett
Well location and land description: 1,983' FEL and 650' FSL (SE/4 SW/4) Section 2-T5N-R10W
Duval County, Texas

The above is for well and Contract identification only and Contractor assumes no liability whatsoever for a proper survey or location stake on Operator's lease.

2. COMMENCEMENT DATE:

Contractor agrees to use reasonable efforts to commence operations for the drilling of well by the __________ day of __________, 19________ or __________, 19________.

3. DEPTH:

Subject to the right of Operator to direct the stopping of work at any time (as provided in Par. 6), the well shall be drilled to the depth as specified below:

3.1 Contract Footage Depth: The well shall be drilled to __________ feet or __________ sufficient depth to test the Norphlet formation, or to the depth at which the __________ inch casing (oil string) is set, whichever depth is first reached, on a footage basis and Contractor is to be paid for such drilling at the footage rate specified below, which depth is hereinafter referred to as the contract footage depth.

3.2 Daywork Basis Drilling: All drilling below the above specified contract footage depth shall be on a daywork basis as defined herein and Contractor shall be paid for such drilling at the applicable daywork rate specified below.

3.3 Complete Daywork Basis Drilling: If all operations hereunder are performed at applicable daywork rates, provisions of this Contract applicable to drilling on a "footage basis" shall not apply.

3.4 Maximum Depth: Contractor shall not be required to drill said well under the terms of this Contract below a maximum depth of __________ feet.

4. FOOTAGE RATE, DAYWORK RATES, BASIS OF DETERMINING AMOUNTS PAYABLE TO CONTRACTOR:

Contractor shall be paid at the following rates for the work performed hereunder:

4.1 Footage Rate: For work performed on a footage basis the rate will be __________ per linear foot of hole drilled determined by steel line measurement from the surface of the ground if Contractor provides cellar, or from the bottom of the cellar if Operator provides cellar, less footage made in regular size hole while working on daywork basis.

4.2 Operating Day Rate: For work performed on a daywork basis the daywork rate per twenty-four hour day with __________ man crew shall be:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Without Drill Pipe</th>
<th>With Drill Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 0 To 450</td>
<td>__________ per day</td>
<td>__________ per day</td>
</tr>
<tr>
<td>From 450 To 4550</td>
<td>__________ per day</td>
<td>__________ per day</td>
</tr>
<tr>
<td>From 4550 To 15,000</td>
<td>__________ per day</td>
<td>__________ per day</td>
</tr>
<tr>
<td>Using Operator's drill pipe</td>
<td>__________ per day</td>
<td>__________ per day</td>
</tr>
</tbody>
</table>

(U.S. Footage Contract — Page 1)
If under the above column "With Drill Pipe" no day rates are specified, the daywork rate per twenty-four hour day when drill pipe is in use shall be the applicable daywork rate specified in the column "Without Drill Pipe" plus compensation for any drill pipe actually used at the rates specified below, computed on the basis of the maximum drill pipe in use at any time during each twenty-four day.

**DRILL PIPE RATES PER 24-HOUR DAY**

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Grade</th>
<th>Uncontrollable Deviated Hole</th>
<th>Size</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Hole</td>
<td>$</td>
<td></td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Directional or</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Drill pipe shall be considered in use not only when in actual use but also while it is being picked up or laid down. When drill pipe is standing in the derrick, it shall not be considered in use, provided, however, that if Contractor furnishes special strings of drill pipe, drill collar, and handling tools as provided for in Exhibit "A", the same shall be considered in use at all times when on location or until released by Operator. In no event shall fractions of an hour be considered in computing the amount of time drill pipe is in use but such time shall be computed to the nearest hour, with thirty minutes or more being considered a full hour and less than thirty minutes not to be counted.

## 4.3 Work Stoppage Rate

The above rate shall apply under the following circumstances:

(a) During any continuous period that normal operations are suspended or cannot be carried on due to conditions of force majeure as defined in Paragraph 22 hereof, it is understood, however, that Operator shall have the right to release the rig to do the work (See Paragraph 6), effective when conditions will permit the rig to be moved from the location.

(b) During any period when Contractor has notified Operator that the rig is available for movement to the drilling site and movement cannot be accomplished because of Operator's failure or inability to furnish and/or maintain adequate roadway and/or canal to location and/or location and/or weather prevents positioning the rig on a water location drill site.

(c) During any period after operations under this Contract have been completed and Operator has released the rig and the same cannot be dismantled and/or transported from the location due to inadequate roadway or canal or weather or water conditions which will not allow such activity to be conducted with reasonable safety.

(d) Operator agrees at all times to maintain the road and location in such a condition that will allow free access and movement to and from the drilling site in an ordinary equipped highway type vehicle. If Contractor is required to use dozers, tractors, four-wheel drive vehicles, or any other specialized transportation equipment for the movement of necessary personnel, machinery, or equipment over access roads or on the drilling location, Operator shall furnish the same at his expense and without cost to Contractor. The actual cost of repairs to any transportation equipment furnished by Contractor or his personnel damaged as result of improperly maintained access roads or location will be charged to Operator.

## 4.4 Repair Time

In the event it is necessary to shut down Contractor's rig for repairs excluding routine rig servicing while Contractor is performing daywork hereunder, Contractor shall be allowed compensation at the applicable daywork rate for such shut down time up to a maximum of 4 hours for any one repair job and a total of 24 hours for each 30 days.

## 4.5 Standby Time Rate with Crews

$4550 per twenty-four (24) hour day. Standby time shall be defined to include time when the rig is shut down although in readiness to begin or resume operations but Contractor is waiting orders of Operator or on material, services or other items to be furnished by Operator.

## 4.6 Reimbursable Costs

Operator shall reimburse Contractor for the costs of materials, equipment, work and services which are to be furnished by Operator as provided for herein but which for convenience are actually furnished by Contractor at Operator's request, plus 0 percent for such cost of handling.

## 4.7 Daywork Operations

In addition to other work specified herein the following work performed by Contractor shall be on a daywork basis:

(a) All drilling below the contract footage depth as provided in Part 3, including the setting of any string of casing below such depth;

(b) All work performed by Contractor, whether or not prior to reaching the contract footage depth, in an effort to restore the hole to such condition that further drilling or other operations may be conducted in the event of loss or damage to the hole as a result of the failure of Operator's casing or equipment either during or after the running and setting of such casing or as a result of the subsequent failure of the cementing job resulting in parted casing;

(c) All work performed when conditions set forth in Paragraph 12 are applicable.
(d) All other work performed by Contractor at the request of Operator, regardless of depth, which is not within the scope of the work to be performed on a footage basis, including all coring, drill stem testing, logging, geophysical surveys, and all other work performed by Contractor in accordance with the terms hereof, including normal footage drilling operations. There shall be included in this provision any time or materials required to condition the hole preparatory to performing such work or to restore the hole to the same drilling conditions, which exist when drilling was suspended. The Contractor and Operator agree to the terms of Paragraph 4.8.4 of this Contract.

4.8 Daywork Time: In determining the amount of daywork time for which Contractor is to be compensated at the applicable daywork rate, it is agreed that such daywork time shall begin when Contractor enters on the premises and finishes normal footage drilling operations. There shall be included in daywork time any time or materials required to condition the hole preparatory to performing such daywork and also the time required to restore the hole to the same drilling conditions, which exist when drilling was suspended. The Contractor and Operator agree to the terms of Paragraph 4.8.4 of this Contract.

4.8 Revision in Rates: The rates and/or payments herein set forth due to Contractor from Operator shall be revised to reflect the change in costs if the costs of any of the items hereafter listed vary by more than N/A percent from the costs thereof on the date of this Contract or by the same percent after the date of any revision pursuant to this paragraph:

(a) Labor costs, including all benefits of Contractor's personnel; N/A
(b) Contractor's cost of insurance premiums; N/A
(c) Contractor's cost of fuel, the cost per gallon/MCF being $ N/A
(d) Contractor's cost of catering, when applicable; N/A
(e) If Operator requires Contractor to increase or decrease the number of Contractor's personnel; N/A
(f) Contractor's cost of spare parts and supplies with the understanding that such spare parts and supplies constitute N/A percent of the Operating Rate and that the parties shall use the U.S. Bureau of Labor Statistics Oilfield Machinery and Equipment Wholesale Price Index (Code No. 1191-02) to determine to what extent a price variance has occurred in said spare parts and supplies;
(g) If there is any change in legislation or regulations in the area in which Contractor is working that alters Contractor's financial burden N/A

5. TIME OF PAYMENT:

Subject to Operator's right to require Contractor to furnish him with satisfactory evidence that Contractor has paid all labor and material claims chargeable to Contractor, payment becomes due by Operator to Contractor as follows:

5.1 Footage Basis: If the well is drilled to total depth on a footage basis, payment becomes due for all services (footage and daywork) when Contractor completes the performance of the services which he agrees to perform under this Contract, provided, however, if Contractor prior to the completion of the Contract performs a substantial amount of daywork, payment for such daywork shall be due and payable upon presentation of invoice therefor at the end of the month in which such daywork was performed.

5.2 Daywork Basis: If the entire hole or the bottom section of the hole is drilled on a daywork basis, payment shall become due as follows: Upon Contractor's completion of the footage basis drilling to the depth specified above and upon acceptance by the Operator of the hole drilled as to such depth in accordance with this Contract, payment becomes due for all footage drilled and for all work performed on a daywork basis to the date of completion of the footage drilled. Payment for drilling and other work performed at daywork rates below the depth specified at which daywork basis drilling commences shall become due upon acceptance by Operator of the work performed in accordance with this Contract upon presentation of invoice therefor upon completion of the well or at the end of the month in which such daywork was performed, whichever shall first occur.

5.3 Disputed Invoices and Late Payment: Operator shall pay all invoices within 45 days after receipt except that if Operator disputes an invoice or any part thereof, Operator shall, within fifteen days after receipt of the invoice, notify Contractor of the item disputed, specifying the reason therefor, and payment of the disputed item may be withheld until settlement of the dispute, but timely payment shall be made of any undisputed portion. Any sums (including amounts ultimately paid with respect to a disputed invoice not paid within the above specified days) shall bear interest at the rate of 0.833 percent or the maximum legal rate, whichever is less, per month from the due date until paid. If Operator does not pay undisputed items within the above stated time, Contractor may terminate this Contract as specified under subparagraph 5.4.

5.4 Attorney's Fees: If this Contract is placed in the hands of an attorney for collection of any sums due hereunder, or suit is brought on same, or sums due hereunder are collected through bankruptcy or probate proceedings, then Operator agrees that there shall be added to the amount due reasonable attorney's fees and costs.

6. STOPPAGE OF WORK BY OPERATOR OR CONTRACTOR:

6.1 By Operator: Notwithstanding the provisions of Paragraph 3 with respect to the depth to be drilled, Operator shall have the right to direct the stoppage of the work to be performed by the Contractor hereunder at any time prior to reaching the specified depth, and even though Contractor has made no default hereunder, and in such event Operator shall be under no obligation to Contractor except as set forth in subparagraph 6.2 hereof.

6.2 By Contractor: Notwithstanding the provisions of Paragraph 3, with respect to the depth to be drilled, in the event of Force Majeure necessitating a termination of operations, or in the event of total or constructive total loss of the rig, or if Operator shall become insolvent, or be adjudicated bankrupt, or
file, by way of petition or answer, a debtor's petition or other pleading seeking adjustment of Operator's debts, under any bankruptcy or debtor's relief laws now or hereafter prevailing, or if any such be filed against Operator, or in case a receiver be appointed of the Operator or Operator's property, or any part of Operator's property, or his or Operator's property, or any part thereof, or Operator's affairs be placed in the hands of a Creditor's Committee, or, following ten days written notice to Operator, if Operator does not pay performance of any work under this Contract and Operator's right to compensation shall be as set forth in subparagraph 6.3 hereof. In addition to claims, demands and causes of action, including all costs of defense, in favor of Operator, Operator's joint ventures, or other parties arising out of any drilling commitments or obligations contained in any lease, farmout agreement or other agreement, which may be affected by such termination of performance hereunder.

6.3 Early Termination Compensation:

(a) Prior to Commencement: In the event this Contract is terminated prior to commencement of operations hereunder, Operator shall pay Contractor as liquidated damages and not as a penalty a sum equal to the Footage Rate (Article 4.1) multiplied by the Contract Footage Depth (Article 3.1) plus the Standby Rate (Article 4.9) for a period of 0 days for estimated daywork drilling below Contract Footage Depth; or a lump sum of $0.

(b) Prior to Spudding: If such work stoppage occurs after commencement of operations but prior to the spudding of the well, Operator shall pay Contractor the sum of the following: (1) all expenses reasonably and necessarily incurred and to be incurred by Contractor by reason of the Contract and by reason of the premature stoppage of the work, excluding, however, expenses of normal drilling crew and supervision; (2) ten percent (10%) of the amount of hereunder down to such date subsequent to the date of work stoppage as will allow Contractor reasonable time to dismantle his rig and equipment.

(c) Subsequent to Spudding: If such work stoppage occurs after the spudding of the well, Operator shall pay the Contractor the amount owing Contractor at the time of such work stoppage under the footage rate, applicable daywork rate, and standby rate; but in such event Operator shall pay Contractor for a minimum footage of 3.25 times the contract footage depth minus actual footage drilled.

7. CASING PROGRAM:

7.1 The casing program to be followed in the drilling of said well is set forth in Exhibit "A", and Contractor shall drill a hole of size specified in Exhibit "A" at the approximate depth therein indicated the size of casing so specified. The exact setting depths for each string of casing shall be specified by Operator. Operator may modify said casing program provided any modification thereof which materially increases Contractor's hazards or costs of performing his obligations hereunder can only be made by mutual consent of Contractor and Operator.

7.2 The setting of any string of casing within the footage contract depth shall be performed as specified in Exhibit "A".

7.3 The setting of any string of casing below the footage contract depth shall be performed by Contractor under the direction of Operator but Operator shall pay Contractor for all time so consumed at the applicable daywork rate.

7.4 Operator reserves the right to require Contractor to set strings of casing or liners in addition to those listed subject to the limitations upon Operator's right to modify the casing program as provided for in Par. 7.1 and in such event Contractor agrees to provide rig time for cementing and testing cement on such liners and strings of casing and to provide rig time for performing cement squeezing jobs as required by Operator. Operator shall pay Contractor for time consumed by such work at the applicable daywork rate.

8. LABOR, EQUIPMENT, MATERIALS, SUPPLIES, AND SERVICES:

The furnishing of labor, equipment, appliances, materials, supplies, and services of whatever character necessary or proper in the drilling and completion of said well and not otherwise specifically provided for herein shall be furnished by Contractor or Operator as specified in Exhibit "A".

8. DRILLING METHODS AND PRACTICES:

8.1 Contractor shall maintain well control equipment in good condition at all times and shall use all reasonable means to control and prevent fires and blow-outs and to protect the hole.

8.2 Subject to the terms hereof, at all times during the drilling of the well, Operator shall have the right to control the mud program, and the drilling fluid must be of a type and have characteristics acceptable to Operator and be maintained by Contractor in accordance with the specifications shown in Par. 2 of Exhibit "A". No change or modification of said specifications which materially increases Contractor's hazards or costs of performing his obligations hereunder shall be made by Operator without consultation with and consent of Contractor. Operator shall have the right to make any tests of
the drilling fluid which may be necessary. Should no mud control program be specified by Operator in Exhibit "A", Contractor shall have the right to determine the mud program and the type and character of drilling fluid during the time that Contractor is performing work upon a footage basis under the terms of this Contract.

9.3 Contractor shall measure the total length of drill pipe in service with a steel tape at the point where the contract footage depth has been reached; and when requested by Operator, before setting casing or liner and after reaching final depth.

9.4 Contractor agrees to furnish equipment, workmen and instruments acceptable to Operator and to make slope tests as provided in Exhibit "A". Unless operations are on a daywork basis, all such slope tests shall be made at Contractor's sole risk, cost and expense. If, in the opinion of Operator, it becomes advisable to obtain the use of an additional slope test instrument and accessory equipment for the purpose either of checking previous readings or of determining the direction of the drift, the rental charges therefor shall be paid by Operator, and the running of same shall be on a daywork basis. Should the hole at any depth during the time Contractor is performing work on a footage basis, have either a deviation from vertical or a change in overall angle in excess of the limits prescribed in Exhibit "A", Contractor agrees to restore the hole to a condition suitable to Operator either by conventional methods and procedures while drilling ahead or by cementing off and redrilling. While operations are being performed on a "Daywork Basis" or during "Complete Daywork Basis Drilling", Contractor agrees to exercise due diligence and care to maintain the straight hole specifications. If any, set forth in Par. 3 of Exhibit "A" but all risk and expense of maintaining such specifications or restoring the hole to a condition suitable to Operator shall be assumed by Operator.

9.5 Each party hereto agrees to comply with all laws, rules, and regulations of any federal, state or local governmental authority which are now or may become applicable to that party's operations covered by or arising out of the performance of this Contract. The terms of Exhibit B shall apply to this Contract. In the event any provision of this Contract is inconsistent with, or contrary to any applicable federal, state or local law, rule or regulation, said provision shall be deemed to be modified to the extent required to comply with said law, rule, or regulation, and as so modified said provision and this Contract shall continue in full force and effect.

10. COMPLETION TESTS AND INSTALLATION OF WELL CONNECTIONS OR ABANDONMENT:

Contractor will either complete the well and install well head equipment and connections or plug and abandon same, in accordance with Operator's instructions, at the applicable rates set forth in Par. 4 above, using equipment, materials and services to be furnished and paid for by either Operator or Contractor as specified in Exhibit "A".

11. CORES AND CUTTINGS:

11.1 As directed by Operator and utilizing the type of coring equipment specified and furnished as shown in Exhibit "A", Contractor agrees at any time to take either a test hole or full hole conventional or wire line cores in the manner requested by Operator. Regardless of depth, all coring shall be paid for at the applicable daywork rate. All coring footage shall be deducted from the total footage charge if the well is being drilled on a footage basis at that depth. Sampling of the test hole shall be paid for at the applicable daywork rate.

11.2 When requested by Operator, Contractor shall save and identify the cuttings and cores, free from contamination, and place them in separate containers which shall be furnished by Operator; such cuttings and cores shall be made available to a representative of Operator at the location.

12. FORMATIONS DIFFICULT OR HAZARDOUS TO DRILL:

12.1 In the event chert, pyrite, quartzite, granite, igneous rock or other penetrable substance, is encountered while drilling on the footage basis and the footage drilled during each twenty-four (24) hour period multiplied by the footage rate does not equal the applicable daywork rate plus cost of bits, all drilling operations shall be conducted on a daywork basis at the applicable daywork rate, with Operator furnishing the bits, until normal drilling operations and procedures can be resumed. The footage drilled on daywork rate shall be deducted from the footage charge.

12.2 In the event water flow, domal, steeply dipping or faulted formation, abnormal pressure, underground mine or cavern, heaving formation, salt or other condition is encountered which makes drilling abnormally difficult or hazardous, causes sticking of drill pipe or casing, or other difficulty which precludes drilling ahead under reasonably normal procedures, Contractor shall, in all such cases, without undue delay, exert every reasonable effort to overcome such difficulty. When such condition is encountered, further operations shall be conducted on a daywork basis at the applicable daywork rate until such conditions have been overcome and normal drilling operations can be resumed. Operator shall assume the risk of loss or damage to the hole and to Contractor's equipment in the hole from the time such condition is encountered. The footage drilled while on daywork basis shall be deducted from the footage charge. Only after the District Operations Mgr. or his designee has been notified.

12.3 In the event loss of circulation or partial loss of circulation is encountered, Contractor shall, without undue delay, exert every reasonable effort to overcome such difficulty. When such condition is encountered, Operator shall assume the risk of loss or damage to the hole and to Contractor's equipment in the hole. Should such condition persist in spite of Contractor's efforts to overcome it, then after a period of __________ hours time consumed in such efforts, further operations shall be conducted on a daywork basis at the applicable daywork rate until such condition has been overcome and normal
drilling operations can be resumed. The total rig time furnished by Contractor under the terms of this paragraph shall be limited to a cumulative _24_ hours. The footage drilled while on daywork basis shall be deducted from the footage charge.

13. REPORTS TO BE FURNISHED BY CONTRACTOR:

13.1 Contractor shall keep and furnish to Operator an accurate record of the work performed and formations drilled on the IADC/ API Daily Drilling Report Form or other form acceptable to Operator. A legible copy of said form signed by Contractor's representative shall be furnished by Contractor to Operator.

13.2 Delivery tickets, if requested by Operator, covering any material or supplies furnished by Operator shall be turned in each day with the daily drilling report. The quantity, description, and condition of materials and supplies so furnished shall be checked by Contractor and such tickets shall be properly certified by Contractor.

14. INGRESS AND EGRESSION TO LOCATION:

Operator hereby assigns to Contractor Operator's rights of ingress and egress with respect to the tract of land where the well is to be located for the performance by Contractor of all work contemplared by this Contract. Should Contractor be denied free access to the location for any reason not reasonably within Contractor's control, any time lost by Contractor as a result of such denial shall be paid for at the applicable rate in keeping with the stage of operations at that time. In the event there are any restrictions, conditions, or limitations in Operator's lease which would affect the free right of ingress and egress to be exercised by Contractor hereunder, its employees, or subcontractors, Operator agrees to timely advise Contractor in writing with respect to such restrictions, conditions, or limitations, and Contractor agrees to observe same. Operator shall reimburse Contractor for all amounts reasonably expended by Contractor for repairs and/or replacement of public roads, bridges and related or similar facilities required as a direct result of a rig move pursuant to performance hereunder.

15. RESPONSIBILITY FOR A SOUND LOCATION:

Operator shall prepare a sound location, adequate in size and capable of properly supporting the drilling rig, and shall be responsible for a conductor pipe program adequate to prevent soil and subsoil washout. It is recognized that Operator has superior knowledge of the location and access routes to the location, and must advise Contractor of any subsurface conditions, or obstructions (including, but not limited to, mines, cavens, sink holes, streams, pipelines, power lines and telephone lines) which Contractor might encounter while on route to the location or during operations hereunder. In event of subsurface conditions cause a casing or shifting of the location surface, or if sealed conditions prove unsatisfactory to properly support the rig during marine operations hereunder, and loss or damage to the rig or its associated equipment results therefrom, Operator shall, without regard to other provisions of this Contract, reimburse Contractor to the extent not covered by Contractor's Insurance, for all such loss or damage including payment of work stoppage rate during repair and/or demobilization if applicable.

16. INSURANCE:

During the life of this Contract, Contractor shall at Contractor's expense maintain, with an insurance company or companies authorized to do business in the state where the work is to be performed and satisfactory to Operator, insurance coverage for the kind and in the amounts set forth in Exhibit "A", Contractor shall, if requested to do so by Operator, procure from the company or companies writing said insurance a certificate or certificates satisfactory to Operator that said insurance is in full force and effective and that the same shall not be cancelled or materially changed without ten (10) days prior written notice to Operator. For liabilities assumed hereunder by Contractor, its Insurance shall be endorsed to provide that the underwritters waive their right of subrogation against Operator. Operator will, as well, cause its insurer to waive subrogation against Contractor for liability it assumes.

17. PAYMENT OF CLAIMS:

Contractor agrees to pay all claims for labor, material, services, and supplies to be furnished by Contractor hereunder, and agrees to allow no lien or charge to be fixed upon the lease, the well, or other property of Operator or the land upon which said well is located.

18. RESPONSIBILITY FOR LOSS OR DAMAGE:

18.1 Contractor's Surface Equipment: Contractor shall assume liability at all times, regardless of whether the work is being performed on a footage basis or daywork basis, for damage to or destruction of Contractor's surface equipment, including but not limited to all drilling tools, machinery, and appliances, for use about the surface, regardless of when or how such damage or destruction occurs, except for such loss or damage as provided in Paragraphs 15 and 18.4 herein, and Operator shall be under no liability to reimburse Contractor for any such loss.

18.2 Contractor's In-Hole Equipment — Footage Basis: Contractor shall assume liability at all times while work is being performed on a footage basis for damage to or destruction of Contractor's in-hole equipment, including but not limited to, drill pipe, drill collars, and tool joints, and Operator shall be under no liability to reimburse Contractor for any such loss except as provided for in Paragraphs 12.2, 12.3, 15 and 18.4.
18.3 Contractor’s In-Hole Equipment — Daywork Basis: Operator shall assume liability at all times for damage to or destruction of Contractor’s In-hole equipment, including but not limited to, drill pipe, drill collars, and tool joints, and Operator shall reimburse Contractor for the value of any such loss or damage; the value to be determined by agreement between Contractor and Operator at current repair cost or 100 percent of current new replacement cost of such equipment delivered to the well site.

18.4 Contractor’s Equipment — Environmental Loss or Damage: Notwithstanding the provisions of Paragraph 18.1 above, Operator shall assume liability at all times for the construction or destruction of Contractor’s equipment caused by exposure to highly corrosive or otherwise destructive elements, including those introduced into the drilling fluid.

18.5 Operator’s Equipment: Operator shall assume liability at all times for damage to or destruction of Operator’s equipment, including but not limited to, casing, tubing, wellhead equipment, and platform if applicable, and Contractor shall be under no liability to reimburse Operator for any loss or damage.

18.6 The Hole — Footage Basis: Subject to the provisions of Paragraphs 12 and 15 hereof, should a fire or blowout occur or should the hole for any cause attributable to Contractor’s operations be lost or damaged while Contractor is engaged in the performance of work hereunder on a footage basis, all such loss or damage to the hole shall be borne by Contractor; and if the hole is not in condition to be carried to the contract depth as herein provided, Contractor shall, if requested by Operator, commence a new hole without delay at Contractor’s cost, and the drilling of the new hole shall be conducted under the terms and conditions of this Contract in the same manner as though it were the first hole. In such case Contractor shall not be entitled to any payment or compensation for expenditures made or incurred by Contractor on or in connection with the abandoned hole, except for daywork earned in boring, testing, and logging said well for which Contractor would have been compensated had such hole not been junked and abandoned.

Notwithstanding the foregoing provisions, if the hole is lost or damaged as the result of the failure of Operator’s casing or equipment either during or after the running and cementing of such casing, or as a result of subsequent failure of the cementing job resulting in parted casing, such loss shall be borne by Operator and Contractor shall nevertheless be paid: (a) For all footage drilled and other work performed by Contractor prior thereto; (b) For work performed in an effort to restore the hole to such condition as that further drilling or other operations may be conducted at the applicable daywork rate; and (c) The cost of dismantling the rig and moving to and rigging up Operator’s equipment prior to starting the drilling of a new hole at a location designated by Operator if such be required. The work of drilling the new hole shall be performed by Contractor under the terms and conditions of this Contract.

18.7 The Hole — Daywork Basis: In the event the hole should be lost or damaged, while Contractor is working on a daywork basis, Operator shall be solely responsible for such damage to or loss of the hole, including the casing therein, as well as for cost of control of any wild well.

18.8 Underground Damage: Operator agrees to defend and indemnify Contractor for any and all claims against Contractor resulting from operations under this Contract on account of injury to, destruction of, or loss or impairment of any property right in or to oil, gas, or other mineral substance or water, if at the time of the act or omission causing such injury, destruction, loss, or impairment, said substance had not been reduced to physical possession above the surface of the earth, and for any loss or damage to any formation, strata, or reservoir beneath the surface of the earth.

18.9 Inspection of Materials Furnished by Operator: (a) Contractor agrees to inspect all materials furnished by Operator before using same and notify Operator of any defects therein. Contractor shall be liable for any loss or damage resulting from the use of materials furnished by Operator, (b) Contractor will keep, assemble, disassemble, or assemble materials to be furnished by Operator only when directed by Operator and when such work can be accomplished by normal rig personnel. Contractor shall assume no liability for such service. All of such services shall be performed on a daywork basis.

18.10 Contractor’s Indemnification of Operator: Contractor agrees to protect, defend, indemnify, and save Operator, its officers, directors, employees and joint owners harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Contractor’s employees or Contractor’s subcontractors or their employees, or Contractor’s lessees, on account of bodily injury, death or damage to property, if it judicially determined that the monetary limits of insurance required hereunder or of the indemnities voluntarily and mutually assumed under paragraph 18.10 (which Contractor and Operator hereby agree will be supported either by available liability insurance, under which the insurer has no right of subrogation against the indemnitees, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law. It is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

18.11 Operator’s Indemnification of Contractor: Operator agrees to protect, defend, indemnify, and save Contractor, its officers, directors, employees and joint owners harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Operator’s employees or Operator’s subcontractors or their employees, or Operator’s lessees other than those parties identified in paragraph 18.10 on account of bodily injury, death or damage to property. If it judicially determined that the monetary limits of insurance required hereunder or of the indemnities voluntarily and mutually assumed under paragraph 18.11 (which Contractor and Operator hereby agree will be supported either by available liability insurance, under which the insurer has no right of subrogation against the indemnitees, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.
18.12 Pollution and Contamination: Notwithstanding anything to the contrary contained herein, except the provisions of Paragraphs 15 and 18.13, it is understood and agreed by and between Contractor and Operator that the responsibility for pollution and contamination shall be as follows:

(a) Unless otherwise provided herein, Contractor shall assume all responsibility for, including control and removal of, and protect, defend and save harmless Operator from and against all claims, demands and causes of action of every kind and character arising from pollution or contamination which originates above the surface of the land or water from spills of fuels, lubricants, motor oils, normal water base drilling fluid, pipe dope, paints, solvents, ballast, bilge and garbage, except unavoidable pollution from reserve pits, wholly in Contractor's possession and control and directly associated with Contractor's equipment and facilities.

(b) Operator shall assume all responsibility for, including control and removal of, protect, defend and save harmless Contractor from and against all claims, demands, and causes of action of every kind and character arising directly or indirectly from all other pollution or contamination or any other uncontrolled flow of oil, gas, water or other substance, as well as, the use or disposition of oil emulsion, oil base or chemically treated drilling fluids, contaminated cuttings or savings, lost circulation and fish recovery materials and fluids.

(c) In the event a third party commits an act or omission which results in pollution or contamination for which either Contractor or Operator, for whom such party is performing work, is held to be legally liable, the responsibility therefor shall be considered, as between Contractor and Operator, to be the same as if the party for whom the work was performed had performed the same and all the obligations respecting defense, indemnity, holding harmless and limitation of responsibility and liability, as set forth in (a) and (b) above, shall be specifically applied.

18.13 Termination of Location Liability: When Contractor has complied with all obligations of the Contract regarding restoration of Operator's location, Operator shall thereafter be liable for damage to property, personal injury or death of any person which occurs as result of condition of the location and Contractor shall be relieved of such liability provided, however, if Contractor shall subsequently reenter upon the location for any reason, including removal of the rig, any term of the Contract relating to such reentry activity shall become applicable during such period.

18.14 Consequential Damages: Neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of this Contract, including, without limitation, loss of profit or business interruptions, however same may be caused.

18.15 Indemnity Obligation: Except as otherwise expressly limited herein, it is the intent of parties hereto that all indemnity obligations and/or liabilities assumed by such parties under terms of this Contract, including without limitation, paragraphs 18.1 through 18.14 hereof, be without limit and without regard to the cause or causes thereof (including pre-existing conditions), the unsavoriness of any vessel or vessels, strict liability, or the negligence of any party or parties, whether such negligence be sole, joint or concurrent, active or passive. The terms and provisions of paragraphs 18.1 through 18.14 shall have no application to claims or causes of action asserted against Operator or Contractor by reason of any agreement of indemnity with a person or entity not a party hereto.

10. INDEPENDENT CONTRACTOR RELATIONSHIP:

10.1 In the performance of the work herein contemplated on a "footage basis", Contractor is an independent contractor, with the authority to control and direct the performance of the details of the work, Operator being only interested in the results obtained. The work on such "footage basis" shall meet the approval of Operator and be subject to the right of inspection and supervision herein provided. Operator shall not unreasonably withhold approval of all such work, when performed by Contractor in accordance with the generally accepted practices and methods customary in the industry. Contractor agrees to comply with all laws, rules, and regulations, Federal, State, and Local, which are now, or may in the future become applicable to Contractor. Contractor's business, equipment, and personnel engaged in operations covered by this Contract or accruing out of the performance of such operations; provided, however, as between Operator and Contractor specific provisions herein contained respecting the risk and responsibility for such compliance shall be controlling.

10.2 Operator shall be privileged to designate a representative or representatives who shall at all times have access to the premises for the purpose of observing tests or inspecting the work of Contractor. Such representative or representatives shall be empowered to act for Operator in all matters relating to the work herein undertaken and Contractor shall be entitled to rely on the orders and directions issued by such representative or representatives as being those of Operator.

20. AUDITS:

If any payment provided for hereunder is made on the basis of Contractor's costs, Operator shall have the right to audit Contractor's books and records relating to such costs. Contractor agrees to maintain such books and records for a period of two (2) years from the date such costs were incurred and to make such books and records available to Operator at any reasonable time or times within the period.
21. NO WAIVER EXCEPT IN WRITING:

It is fully understood and agreed that none of the requirements of this Contract shall be considered as waived by either party unless the same is done in writing, and then only by the persons executing this Contract, or other duly authorized agent or representative of the party.

22. FORCE MAJEURE:

Neither Operator nor Contractor shall be liable to the other for any delays or damage or failure to act due, occasioned or caused by reason of any laws, rules, regulations or orders promulgated by any Federal, State or Local governmental body or the rules, regulations, or orders of any public body or official purporting to exercise authority or control respecting the operations covered hereby, including the procuring or use of tools and equipment, or due, occasioned or caused by strikes, action of the elements, water conditions, inability to obtain fuel or other critical materials or other causes beyond the control of the party affected thereby. In the event that either party hereto is rendered unable, wholly or in part, by any of these causes to carry out its obligation under this Contract, it is agreed that such party shall give notice and details of Force Majeure in writing to the other party as promptly as possible after its occurrence. In such cases, the obligations of the party giving the notice shall be suspended during the continuance of any inability so caused except that Operator shall be obligated to pay to Contractor the Work Stoppage rate set forth in Paragraph 4.3 above.

23. GOVERNING LAW:

This Contract shall be governed and interpreted under the laws of the State of Texas.

24. INFORMATION CONFIDENTIAL:

Upon written request by Operator, information obtained by Contractor in the conduct of drilling operations on this well, including, but not limited to depth, formations penetrated, the results of coring, testing, and surveying, shall be considered confidential and shall not be divulged by Contractor or his employees, to any person, firm, or corporation other than Operator's designated representative.

25. SUBCONTRACTS BY OPERATOR:

Operator may employ other contractors to perform any of the operations or services to be provided or performed by it according to Exhibit "A".

26. ASSIGNMENT:

Neither party may assign this Contract without the prior written consent of the other, and prompt notice of any such intent to assign shall be given to the other party. In the event of such assignment, the assigning party shall remain liable to the other party as a guarantor of the performance by the assignee of the terms of this Contract. If any assignment is made that materially alters Contractor's financial burden, Contractor's compensation shall be adjusted to give effect to any increase or decrease in Contractor's operating costs.

27. NOTICES AND PLACE OF PAYMENT:

All notices to be given with respect to this Contract unless otherwise provided for shall be given to Contractor and to Operator respectively at the addresses hereinafter shown. All sums payable hereunder to Contractor shall be payable at his address hereinafter shown unless otherwise specified herein.

28. SPECIAL PROVISIONS:
20. ACCEPTANCE OF CONTRACT:
The foregoing Contract is agreed to and accepted by Operator this __________ day of ___________________________ 19

OPERATOR              Mid-America Oil & Gas Corp

By __________________________

Title __________________________

The foregoing Contract is accepted by the undersigned as Contractor this __________ day of ___________________________ 19

which is effective date of this Contract, subject to rig availability, and subject to all of its terms and provisions, with the understanding that it will not be binding upon Operator until Operator has noted its acceptance, and with further understanding that unless said Contract is thus executed by Operator within __________ days of the above date Contractor shall be in no manner bound by its signature thereto.

CONTRACTOR              Worldwide Drilling Company

By__________________________

Title __________________________
INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS
MODEL TURNKEY CONTRACT

Adopted February, 1988

NOTE: This model contract is a suggested guide only and use of this form or any variation thereof shall be at the sole discretion and risk of the user parties. Users of the model contract or any portion thereof are encouraged to seek the advice of counsel to ensure that their contract reflects the complete agreement of the parties and applicable law.

THIS AGREEMENT, made and entered into on the date hereinafter set forth by and between the parties herein designated as "Operator" and "Contractor."

OPERATOR: __________________________________________________________
Address: ____________________________________________________________

CONTRACTOR: _______________________________________________________
Address: ____________________________________________________________

IN CONSIDERATION of the mutual promises, conditions and agreements herein contained and the specifications and special provisions set forth in Exhibit "A" and Exhibit "B" attached hereto and made a part hereof, Operator engages Contractor as an independent contractor to drill the hereinafter designed well in search of oil or gas on a turnkey basis.

For purposes hereof the term "turnkey basis" means Contractor shall furnish the equipment, labor, and perform services as herein provided to drill a well, as specified by Operator, to the turnkey depth. Subject to terms and conditions hereof, payment to Contractor at a stipulated price is earned upon attaining such turnkey depth and completion of the other obligations of Contractor hereunder. While drilling on a turnkey basis Contractor shall direct, supervise and control drilling operations and assumes certain liabilities to the extent specifically provided for herein. Notwithstanding that this is a turnkey agreement, Contractor and Operator recognize that certain portions of the operations as hereinafter designated, may be performed on a daywork basis. For purposes hereof the term "daywork basis" means Contractor shall furnish equipment, labor, and perform services as herein provided, for a specified sum per day under the direction, supervision and control of Operator (which term is deemed to include any employee, agent, consultant, or subcontractor engaged by Operator to direct drilling operations). When operating on a daywork basis, Contractor shall be fully paid at the applicable rates of payment and assumes only the obligations and liabilities stated herein as being applicable during daywork operations. Except for such obligations and liabilities specifically assumed by Contractor, Operator shall be solely responsible and assumes liability for all consequences of operations by both parties while on a daywork basis, including results and all other risks or liabilities incurred in or incident to such operations.

1. LOCATION OF WELL:
   Well name and number: ________________________________________________
   Parish/County: __________________________ State: _______________ Field: __________
   Well location and land description: _______________________________________

   ___________________________ __________________________
   _______________ _______________
The above is for well and contract identification only and Contractor assumes no liability whatsoever for a proper survey or location stake on Operator's lease.

2. COMMENCEMENT DATE:
2.1 Contractor agrees to use reasonable efforts to commence operations for the drilling of well by the ________ day of ________________.

2.2 Notwithstanding any provision in this contract to the contrary, in the event Operator fails for any reason (including, but not limited to, Force Majeure) to permit Contractor to commence operations for the drilling of the well by ________________, Contractor may, at its option, elect to terminate this contract, and Contractor's right to compensation shall be as set forth in subparagraph 8.3(a) hereof.

3. DEPTH:
Subject to the right of the Operator to direct the stoppage of work at any time (as provided in Article 6), the well shall be drilled to the depth from the surface of the ground as specified below:

3.1 Turnkey Depth: The well shall be drilled to ____________ feet or ____________________________ of the ____________ formation, or the depth at which the ____________ inch casing or liner is set, whichever is the lesser depth, which will herein be referred to as the turnkey depth.

3.2 Daywork Basis Drilling: All drilling below turnkey depth and all work performed which is not specified herein to be performed by Contractor on a turnkey basis shall be performed on a daywork basis as defined herein and Contractor shall be paid for such drilling and work at the applicable daywork rate specified below.

3.3 (a) Agreement Depth: The well shall be drilled to a total depth of ____________ feet, or ____________________________ formation, whichever depth is first reached, which depth is hereunder referred to as the Agreement depth.

(b) Maximum Depth: Contractor shall not be required to drill said well under the terms of this Agreement below a maximum depth of ____________ feet.

4. TURNKEY AMOUNT, DAYWORK RATES, BASIS OF DETERMINING AMOUNTS PAYABLE TO CONTRACTOR:
   Contractor shall be paid as follows for the work performed hereunder.

4.1 Turnkey Amount: For work performed on a turnkey basis as herein provided the amount will be $_____________________. The turnkey amount will be $_____________________. The turnkey amount will be $_____________________. The turnkey amount will be $_____________________. If the turnkey depth is reached and the well is plugged and abandoned.

4.2 Operating Day Rate: For work performed on a daywork basis the daywork rate per twenty-four hour day with _______ man crew will be:

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<tr>
<th>DEPTH INTERVALS</th>
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Using Operator's drill pipe $______________ per day

Directional or uncontrolled deviated hole will be deemed to exist when deviation exceeds _______ degrees.

Drill pipe shall be considered in use not only when in actual use but also while it is being picked up or laid down. When drill pipe is standing in the derrick, it shall not be considered in use, provided, however, that if Contractor furnishes special strings of drill pipe, drill collars, and handling tools as
provided in Exhibit "A", the same shall be considered in use at all times when on location or until released by Operator. In no event shall fractions of an hour be considered in computing the amount of time drill pipe is in use but such time shall be computed to the nearest hour, with thirty minutes or more being considered a full hour and less than thirty minutes not to be counted.

4.3 Repair Time: In the event it is necessary to shut down Contractor's rig for repairs excluding routine rig servicing while Contractor is performing daywork hereunder, Contractor shall be allowed compensation at the applicable daywork rate for such shut down time up to a maximum of ________ hours for any one rig repair job or ________ hours for any calendar month. Routine rig servicing shall include, but not be limited to, ________.

4.4 Standby Time: Rate with crews $________ per twenty-four (24) hour day. Rate without crews $________ per twenty-four (24) hour day. Standby time shall be defined to include time when the rig is shut down although in readiness to begin or resume operations but Contractor is waiting on orders of Operator or on materials, services or other items to be furnished by Operator.

4.5 Work Stoppage Rate: $________ Per day. $________ Per Hour.

The above rate shall apply under the following circumstances:

(a) During any continuous period that normal operations are suspended or cannot be carried on due to conditions of Force Majeure as defined in Article 21 hereof. It is understood, however, that Operator shall have the right to release the rig in accordance with Operator's right to direct stoppage of work (see Article 6), effective when conditions will permit the rig to be moved from the location.

(b) During any period when Contractor has notified Operator that the rig is available for movement to the drilling site and movement cannot be accomplished because of Operator's failure or inability to furnish and/or maintain adequate roadway or location.

(c) During any period after operations under this Agreement have been completed and Operator has released the rig and the same cannot be dismantled and/or transported from the location due to inadequate roadway or location.

4.6 Reimbursable Costs: Operator shall reimburse Contractor for the costs of material, equipment, work or services which are to be furnished by Operator as provided for herein but which for convenience are actually furnished by Contractor at Operator's request, plus ________ percent for such cost of handling.

4.7 Daywork Operations: In addition to other work specified herein the following work performed by Contractor shall be on a daywork basis:

(a) All drilling after completion of turnkey drilling including the setting of any string of casing below the turnkey depth.

(b) All work performed by Contractor, whether or not prior to reaching the turnkey depth, in an effort to restore the hole to such condition that further drilling or other operations may be conducted, in the event of loss or damage to the hole as a result of any delay by Operator or the failure, at any time, of materials, casing or equipment furnished by Operator.

(c) All other work performed by Contractor at the request of Operator, regardless of depth, which is not specified herein to be performed on a turnkey basis.

(d) All time when Contractor, in accordance with the terms hereof, has suspended turnkey operations to prepare for daywork operations, including all time required to restore the hole to the same drilling condition which existed when turnkey operations were suspended.

5. TIME OF PAYMENT:

Subject to Operator's right to require Contractor to furnish it with reasonable evidence that Contractor has paid all labor and material claims chargeable to Contractor, payment becomes due by Operator to Contractor as follows:

5.1 Turnkey Basis: Payment becomes due for all turnkey services when Contractor completes the drilling to turnkey depth and performs the services as specified under this Agreement. Payment for such work shall be due and payable upon presentation of invoice to Operator and Operator's acceptance of work performed as specified in Article 10.

5.2 Daywork Basis: Payment for drilling and other work performed at daywork rates shall become due upon acceptance by Operator of the work performed in accordance with this Agreement upon presentation of invoice therefor upon completion of the work or at the end of the month in which such daywork was performed, whichever shall first occur.
5.3 Late Payment: Any sum or sums not paid within ________ days after the date hereinabove specified shall bear interest at the rate of ________ percent per annum or the maximum legal rate, whichever is less, from such date until paid.

5.4 Attorney's Fees: If this Agreement is placed in the hands of an attorney for collection of any sums due hereunder, or suit is brought on same, or sums due hereunder are collected through bankruptcy or probate proceedings, then Operator agrees that there shall be added to the amount due reasonable attorney's fees and costs.

6. STOPPAGE OF WORK BY OPERATOR OR CONTRACTOR:

6.1 By Operator: Notwithstanding the provisions of Article 3 with respect to the depth to be drilled, Operator shall have the right to direct the stoppage of work to be performed by the Contractor hereunder at any time prior to reaching the turnkey depth, and even though Contractor has made no default hereunder, in such event Operator shall be under no obligation to Contractor except as set forth in Article 6.3 hereof.

6.2 By Contractor: Notwithstanding the provisions of Article 3 with respect to the depth to be drilled, should Operator fail to make any payment when due in accordance with this Agreement or should the drilling unit be lost or destroyed or in the event Operator shall become insolvent, or be adjudicated bankrupt, or file, by way of petition or answer, a debtor's petition or other pleading seeking adjustment of Operator's debts, under any bankruptcy or debtor's relief laws now or hereafter prevailing, or if any such be filed against Operator, or in case a receiver be appointed of the Operator or Operator's property, or any part thereof, or Operator's affairs be placed in the hands of a Creditor's Committee, Contractor may, at its option, elect to terminate further performance of any work under this Agreement and Contractor's right to compensation shall be set forth in Article 6.3 hereof. In addition to Contractor's right to terminate performance hereunder, Operator hereby expressly agrees to protect, indemnify and save Contractor harmless from any claims, demands and causes of action, including all costs of defense in favor of Operator, Operator's co-venturers, or other parties arising out of any drilling commitments or obligations contained in any lease, farmout agreement or other agreement, which may be affected by such termination of performance hereunder.

6.3 Early Termination Compensation:
(a) Prior to Commencement: In the event Operator terminates this Agreement prior to commencement of operations hereunder, Operator shall pay Contractor as liquidated damages, and not as a penalty, ________% of all expenses reasonably and necessarily incurred and to be incurred by the Contractor by reason of this Agreement and by reason of the premature stoppage of work, plus the sum of $__________.
(b) After Commencement: If such work stoppage occurs after commencement of operations, but before the turnkey depth is reached, the Operator shall pay Contractor as liquidated damages and not as penalty:
   (1) an amount equal to the number of days the rig was moving (including time spent rigging up and dismantling the rig) or in operation at the applicable day rate shown in Article 4.2; plus
   (2) ________% of the cost of all items furnished by the Contractor that would have been furnished by the Operator if the Agreement had been on a daywork basis; plus
   (3) ________% of the cost of all other expenses reasonably and necessarily incurred and to be incurred by Contractor by reason of this Agreement and by reason of the premature stoppage of work excluding, however, the expense of normal drilling crew and supervision; plus
   (4) the sum of $__________.

7. CASING PROGRAM:

7.1 The casing program to be followed in the drilling of said well is set forth in Exhibit "A", paragraph 2 and Contractor shall drill a hole of size specified in Exhibit "A", paragraph 2, to set at the approximate depth therein indicated the size of casing so specified.

7.2 The setting of any string of casing within the turnkey depth shall be performed as specified in Exhibit "A", paragraph 10.

7.3 The setting of any string of casing below the turnkey depth shall be performed under the direction of Operator and Operator shall pay Contractor for all time so consumed at the applicable daywork rate.
7.4 Operator or Contractor may modify said casing program provided any modifications thereof which materially increase Contractor's hazards or costs of performing its obligations hereunder can only be made by mutual written consent of Contractor and Operator. In such event Contractor agrees to provide rig time for running, cementing, and testing cement on such lines and strings of casing and to provide rig time for performing cement squeezing jobs as required by Operator. Operator shall furnish all necessary materials and services and shall pay Contractor for time consumed by such work at the applicable daywork rate.

8. LABOR, EQUIPMENT, MATERIALS, SUPPLIES, AND SERVICES:

The furnishing of labor, equipment, appliances, materials, supplies, and services of whatever character necessary or proper in the drilling and completion of said well and not otherwise specifically provided for herein shall be furnished by Contractor or Operator as specified in Exhibit "A".

9. DRILLING METHODS AND PRACTICES:

9.1 Contractor shall maintain well control equipment in good condition at all times and shall use all reasonable means to control and prevent fires and blow outs and to protect the hole.

9.2 The drilling mud shall be provided by the party designated in Exhibit "A", paragraph 10.36. The Contractor shall have the right to control the Mud Program and determine the type and character of drilling fluid during the time that Contractor is performing work on a turnkey basis under the terms of this Agreement as specified in Exhibit "A", paragraph 5.

9.3 Subject to the terms hereof, at all times during the drilling of the well on a daywork basis Operator shall have the right to control the mud program, and the drilling fluid must be of a type and have characteristics acceptable to Operator and be maintained by Contractor in accordance with specifications shown in paragraph 5 of Exhibit "A". The cost of maintaining the mud system while on daywork will be borne by the Operator. No change or modification of said specifications which increases Contractor's hazards or costs of performing its obligations hereunder shall be made by Operator without consultation with and consent of Contractor. Operator shall have the right to make any tests of the drilling fluid which may be necessary at Operator's expense.

9.4 Contractor shall measure the total length of drill pipe in service with a steel tape at the point where the turnkey depth has been reached; and when requested by Operator, on a daywork basis, before setting casing or liner and after reaching final depth.

9.5 Contractor agrees to furnish equipment, workmen and instruments acceptable to Operator and to make slope tests as provided in Exhibit "A", paragraph 4. All such slope tests shall be made at Contractor's sole risk, cost and expense until turnkey depth is reached while working on a turnkey basis. If, in the opinion of Operator, it becomes advisable to obtain the use of an additional slope test instrument and accessory equipment for the purpose either of checking previous readings or of determining the direction of the drill, the rental charges therefor shall be paid by Operator, and the running of same shall be on a daywork basis. Should the hole at any depth during the time Contractor is performing work on a turnkey basis, have either a deviation from vertical or a change in overall angle in excess of the limits prescribed in Exhibit "A", paragraph 4, Contractor agrees to restore the hole to a condition suitable to Operator by conventional methods and procedures while drilling ahead or by cementing off and redrilling. While operations are being performed on a Daywork Basis, or after turnkey depth is reached, Contractor agrees to exercise due diligence and shall maintain the straight hole specifications, if any, set forth in paragraph 4 of Exhibit "A" but all risk and expense of maintaining such specifications or restoring the hole to a condition suitable to Operator shall be assumed by Operator.

10. TURNKEY COMMITMENTS AND LIABILITY:

10.1 Upon completion by Contractor of all operations to be performed by it under the turnkey basis as specified in Exhibit "A", paragraph 10, Contractor shall notify Operator of such completion by noting the date and hour of such completion upon the daily drilling report form required by Section 12.1 hereof. No later than twenty-four (24) hours after Operator's receipt of such notification, Operator shall advise Contractor in writing of any objections it may have with respect to Contractor's performance hereunder. Operator's failure to so object to Contractor's performance within the specified period shall be conclusive proof of Operator's acceptance of the well and Contractor's performance hereunder.

10.2 Upon acceptance of the work by Operator pursuant to Section 10.1 hereinafore, all risk of loss with respect to the well drilled hereunder and goods and services provided by Contractor shall pass to Operator. Contractor shall have no liability for any defects in such completed operations. Operator accepts all materials, supplies, equipment and services furnished or performed by Contractor as is and where is. CONTRACTOR MAKES NO
11. CORING, DRILL STEM TEST, AND WIRELINE LOGGING:

11.1 In the event additional rig time should be required for services or purposes other than that which Contractor agrees to furnish, as specified in Exhibit “A”, Contractor shall perform such operations at the risk and expense of Operator, charging Operator for rig time for conducting such operations at the applicable day rate, as set forth in Article 4.

11.2 As directed by Operator and utilizing the type of coring equipment specified in Exhibit “A”, paragraph 5, and furnished as shown in Exhibit “A”, paragraph 10.05 and 10.09, Contractor agrees at any time to attempt either rat-hole or full hole conventional, or wire line cores in the manner requested by Operator.

11.3 When requested by Operator, Contractor shall save and identify the cuttings and cores, free from contamination, and place them in separate containers which shall be furnished by Operator; such cuttings and cores shall be limited to a total of ____ hours cumulative time for circulating for samples while on a turnkey basis. All additional time consumed in circulating for samples while on turnkey shall be paid for by Operator at the applicable day rate, as set forth in Article 4.

11.4 Operator shall have a period of time, not to exceed ____ hours from the time at which the last wireline log run specified in Exhibit “A”, paragraph 7 is out of the hole to determine whether a string of casing or liner is to be run or the well is to be plugged and abandoned. Operator shall pay Contractor the applicable day rate, as set forth in Article 4, for all additional time which Operator may require to decide and to advise Contractor to either commence the running of such string of casing or liner or to plug and abandon the well. If Operator decides not to run a production string of casing the party so designated in Exhibit “A” paragraph 10.79 shall furnish the time, materials, and services required to run such string of casing.

11.5 If at any time Operator desires to conduct a drill stem test or wireline logging operation, it shall be Contractor’s obligation to perform such operation subject to the provisions as specified in Exhibit “A”. Provided, however, if the Contractor considers the hole unsafe to perform such operation, Contractor shall so notify the Operator and provide an explanation. Any such objection will be noted on the daily drilling report. Operator shall nevertheless have the right to have Contractor attempt to conduct such operation but the same shall be performed at the risk of Operator at the applicable daywork rates as set forth in Article 4 and Operator shall be responsible for any and all loss or damage which may result from same.

12. REPORTS TO BE FURNISHED BY CONTRACTOR:

12.1 Contractor shall keep and furnish to Operator an accurate report of the work performed and formations drilled on the IADC-API Daily Drilling Report Form or other form acceptable to Operator. A legible copy of said form signed by Contractor’s representative shall be furnished by Contractor to Operator at _____.

12.2 Delivery tickets, if requested by Operator, covering any material or supplies furnished by Operator shall be turned in each day with the daily drilling report. The quantity, description, and condition of materials and supplies so furnished shall be checked by Operator.

13. INGRESS AND EGRESS TO LOCATION:

Operator hereby assigns to Contractor Operator’s rights of ingress and egress with respect to the tract of land where the well is to be located for the performance by Contractor of all work contemplated by this Agreement. Should Contractor be denied free access to the location for any reason not reasonably within Contractor’s control, any time lost by Contractor as a result of such denial shall be paid for at the applicable rate in keeping with the stage of operations at that time. In the event there are any restrictions, conditions, or limitations in Operator’s lease which would affect the free right of ingress and egress to be exercised by Contractor hereunder, its employees, or subcontractors, Operator agrees to timely advise Contractor in writing with respect to such restrictions, conditions, or limitations, and Contractor agrees to observe same.
14. RESPONSIBILITY FOR ROAD AND SOUND LOCATION:

14.1 The party designated in Exhibit "A", paragraph 10.3 to provide the road agrees at all times to maintain the road in such a condition that will allow free access to and from the drilling site in an ordinary equipped highway type vehicle. If it is necessary to use dozers, tractors, or any other specialized transportation equipment for the movement of necessary personnel, machinery, or equipment over access roads or on the drilling location, the party so designated shall furnish the same at its expense.

14.2 The party designated in Exhibit "A", paragraph 10.4 shall prepare a sound location adequate in size and capable of properly supporting the drilling rig. It is recognized that Operator has superior knowledge of the location and access route to the location and must advise Contractor of any subsurface conditions or obstacles (including but not limited to mines, caverns, sink holes, streams, pipelines, power lines, and telephone lines) which Contractor might encounter while enroute to the location or during operations hereunder. In event subsurface conditions cause a crating or shifting of the location's surface and the loss or damage to the rig or its associated equipment results therefrom, Operator shall without regard to the other provisions of this Agreement reimburse Contractor to the extent not covered by Contractor's insurance for all such loss or damage. If the location is furnished by Operator, Operator shall reimburse Contractor for any costs incurred in leveling and releveling the derrick because of location settling. The location shall be constructed in such a manner so as to allow for adequate drainage and shall conform to all laws, rules and regulations of all federal, state or regulatory agencies having jurisdiction over same.

15. INSURANCE:

During the term of this Agreement, Contractor shall at Contractor's expense maintain with an insurance company or companies authorized to do business in the state where the work is to be performed and satisfactory to Operator, insurance coverage of the kind and in the amounts set forth in Exhibit "A", paragraph 1. Contractor shall, if requested to do so by Operator, procure from the company or companies writing said insurance a certificate or certificates satisfactory to Operator that said insurance is in full force and effect and that the same shall not be cancelled or materially changed without ten (10) days prior written notice to Operator. For liabilities assumed hereunder by Contractor, its insurance shall be endorsed to provide that the underwriters waive their right of subrogation against Operator. Operator will as well, cause its insurer to waive subrogation against Contractor for liability it assumes.

16. PAYMENT OF CLAIMS:

Contractor agrees to pay all valid claims for labor, material, services, and supplies to be furnished by Contractor hereunder, and agrees to allow no ten or charge to be fixed upon the lease, the well, or other property of the Operator or the land upon which said well is located as a result of claims pertaining to labor, material, services and supplies furnished by Contractor.

17. RESPONSIBILITY FOR LOSS OR DAMAGE:

17.1 Contractor's Surface Equipment: Contractor shall assume liability at all times, regardless of whether the work is being performed on a tank or as a daywork basis, for damage to or destruction of Contractor's surface equipment, including but not limited to all drilling tools, machinery, and appliances for use about the surface, and Operator shall be under no liability to reimburse Contractor for any such loss except for such loss or damage provided in Articles 14 and 17.5 herein.

17.2 Contractor's In-Hole Equipment - Turnkey Basis: Contractor shall assume liability at all times while work is being performed on a tank or as a daywork basis for damage to or destruction of Contractor's in-hole equipment including, but not limited to, drill pipe, drill collars, and tool joints, and Operator shall be under no liability to reimburse Contractor for any such loss except as provided for in Article 14. 17.3 Contractor's In-Hole Equipment - Daywork Basis: Operator shall assume liability at all times while work is being performed on a daywork basis for damage to or destruction of Contractor's in-hole equipment including, but not limited to, drill pipe, drill collars, and tool joints, and Operator shall reimburse Contractor for the value of any such loss or damage; the value to be determined by agreement between Contractor and Operator as current repair cost or ______ percent of current new replacement cost of such equipment delivered to the well site.

17.4 Contractor's Equipment - Environmental Loss or Damage - Turnkey Basis: Contractor shall assume liability at all times for damage to or destruction of Contractor's equipment caused by exposure to highly corrosive or otherwise destructive elements, including those introduced into the drilling fluid while drilling on a turnkey basis.
17.5 Contractor’s Equipment - Environmental Loss or Damage - Daywork Basis: Notwithstanding the provisions of 17.1 above, Operator shall assume liability at all times while work is being performed on a daywork basis for damage to or destruction of Contractor’s equipment caused by exposure to highly corrosive or otherwise destructive elements, including those introduced into the drilling fluid while drilling on a daywork basis.

17.6 Operator’s Equipment: Operator shall assume liability at all times for damage to or destruction of Operator’s equipment, including but not limited to casing, tubing and well head equipment, and Contractor shall be under no liability to reimburse Operator for any such loss or damage.

17.7 The Hole - Turnkey Basis: Subject to the provisions hereof, should a fire or blowout occur or should the hole for any cause attributable to Contractor’s operations be lost or damaged while Contractor is engaged in the performance of work hereunder on a turnkey basis, all such loss of or damage to the hole shall be borne by Contractor; and if the hole is not in condition to be carried to the turnkey depth as herein provided, Contractor shall, at Contractor’s option, either:

(a) commence a new hole without delay at Contractor’s cost; the right to drill a substitute well shall be recurring, and the drilling of the new hole shall be conducted under the terms and conditions of this Agreement as though it were the first hole, or

(b) abandon the hole, giving Operator notice of Contractor’s intent and, in such case, Contractor shall not be entitled to any portion of the turnkey price.

If Contractor elects to abandon the hole, the cost to plug and abandon will be at Contractor’s expense. In either case, Contractor shall not be entitled to any payment or compensation for expenditures made or incurred by Contractor on or in connection with the abandoned hole(s), except for daywork earned for which Contractor would have been compensated had such hole not been junked and abandoned.

Notwithstanding the foregoing provisions, if the hole is lost or damaged as a result of the failure of Operator’s casing or equipment either during or after the running and setting of such casing, or as a result of subsequent failure of Operator provided services resulting in parted casing, such loss shall be borne by Operator and Contractor shall nevertheless be paid:

1. 100% of all expenses reasonably and necessarily incurred and to be incurred by Contractor by reason of the Agreement and by reason of the premature stoppage of the work, excluding however, the expense of normal drilling crew and supervision; plus
2. a sum calculated at the appropriate daywork or standby rate for all time from the date upon which Contractor commenced any operations hereunder to such date subsequent to the date of work stoppage as will afford Contractor reasonable time to dismantle its rig and equipment; plus
3. The cost of dismantling the rig, moving to and rigging up Contractor’s equipment prior to starting the drilling of a replacement hole at an offset location designated by Operator, if so requested.

The work of drilling the replacement hole shall be performed by Contractor under the terms and conditions of this Agreement.

17.8 The Hole - Daywork Basis: In the event the hole should be lost or damaged while Contractor is working on a daywork or standby basis, Operator shall be solely responsible for such damage to or loss of the hole, including the casing therein, as well as for cost of control of any wild well. Contractor shall nevertheless be paid as set forth in Article 17.7.

17.9 Sidetracking/Substitute Well Obligations: If, before the turnkey depth is reached, Contractor encounters any condition which in Contractor’s judgment makes drilling abnormally difficult or hazardous including, but not limited to, loss of circulation, partial loss of circulation, water flow, downhole formation, abnormal pressures, heaving shale or other similar condition, which precludes further drilling using normal procedures, then Contractor, at its sole option, may elect to discontinue operations or to sidetrack or commence operations for the drilling of a substitute well at a location agreeable to both parties. The right, but not the obligation, to sidetrack or drill a substitute well(s) shall be recurring. Any substitute well shall be drilled under the terms and conditions of this Agreement. It is understood that Contractor reserves the right to redesign and revise the well program in keeping with good engineering and drilling practices if Contractor at its sole option elects to drill a substitute hole, and also that if Contractor does not obligation itself to drill this hole or a substitute hole the only penalty for failure to do so shall be the loss of compensation to be paid hereunder, and the Contractor shall be under no further obligation of any kind to Operator. In addition to Contractor’s right to terminate performance hereunder, Operator hereby
expressly agrees to protect, indemnify and save Contractor harmless from any claims, demands and causes of action, including all costs of defense, in favor of Operator, Operator's joint interest owners or other parties arising out of any drilling commitments or obligations contained in any lease, farmout agreement or other agreement which may be affected by such termination of performance hereunder.

17.10 Underground Damage: Operator agrees to defend and Indemnify Contractor for any and all claims against Contractor resulting from operations under this Agreement on account of injury to, destruction of, loss or impairment of any property right in or to oil, gas, or other mineral substance or water, and for any loss or damage to any formation, strata, or reservoir beneath the surface of the earth.

17.11 Inspection of Material Furnished by Operator: Contractor agrees to visually inspect all materials furnished by Operator before using same and to notify Operator of any apparent defects therein. Contractor shall not be liable for any loss or damage resulting from the use of materials furnished by Operator. Contractor will preassemble, disassemble, or assemble materials to be furnished by Operator only when directed by Operator and when such work can be accomplished by normal rig personnel. Contractor shall assume no liability for such service. All such services shall be performed on a daywork basis.

17.12 Contractor's Indemnification of Operator: Contractor agrees to protect, defend, indemnify, and save Operator, its officers, directors, employees and joint owners harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Contractor's employees or Contractor's subcontractors or their employees, or Contractor's invitees, on account of bodily injury, death or damage to property. If it is judicially determined that the monetary limits of insurance required hereunder or of the indemnitees voluntarily and mutually assumed under Article 17.12 (which Contractor and Operator hereby agree will be supported either by available liability insurance, under which the Insurer has no right of subrogation against the indemnitees, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

17.13 Operator's Indemnification of Contractor: Operator agrees to protect, defend, indemnify, and save Contractor, its officers, directors, employees and joint owners harmless from and against all claims, demands, and causes of action of every kind and character, without limit and without regard to the cause or causes thereof or the negligence of any party or parties, arising in connection herewith in favor of Operator's employees or Operator's contractors or their employees, or Operator's invitees other than those parties identified in Article 17.12 on account of bodily injury, death or damage to property. If it is judicially determined that the monetary limits of insurance required hereunder or of the indemnitees voluntarily and mutually assumed under Article 17.12 (which Contractor and Operator hereby agree will be supported either by available liability insurance, under which the Insurer has no right of subrogation against the indemnitees, or voluntarily self-insured, in part or whole) exceed the maximum limits permitted under applicable law, it is agreed that said insurance requirements or indemnities shall automatically be amended to conform to the maximum monetary limits permitted under such law.

17.14 (a) Pollution, Contamination and Blowout Control - Turnkey Basis: Except as hereinafter provided, while operations are being conducted on a turnkey basis, Contractor shall assume full responsibility for, and shall defend, indemnify and hold Operator harmless from and against, any loss, expense, claim, demand or liability for pollution or contamination (including control and removal thereof) originating from:

(i) spills, leaks or discharges of fuel, lubricants, motor oils, pipe dope, paint solvents, garbage, seepage or any other liquid or solid whatsoever in the possession and control of Contractor, except such pollution or contamination that may be caused by Operator or Operator's agents, employees or representatives;

(ii) blowout, loss of well control or seepage of underground fluids. In the event of a blowout or well out of control, Contractor assumes liability for control of such well and/or the drilling of a relief well or wells. Contractor's maximum liability under this Article 17.14 shall not however exceed $________ per occurrence, including lost rig time. For the purposes of this Agreement, where a series of and/or several losses occur which are attributable directly or indirectly to one accident, event, or cause, all such losses shall be added together and the total amount of such losses shall be treated as one occurrence irrespective of the period or area over which the losses occur. Operator shall assume full responsibility for all costs and expenses arising under this Article 17.14 in excess of said $________ and shall protect, indemnify and hold Contractor harmless from said excess, regardless of the sole or concurrent negligence or fault of any party, either active or passive, and from any liability imposed under any theory of strict or products liability.
(b) Pollution, Contamination and Blowout Control - Daywork Basis: Notwithstanding anything to the contrary contained herein, except contamination which occurs while operations are being conducted on a daywork basis shall be as follows:

(i) Unless otherwise provided herein, Contractor shall assume all responsibility for, including control and removal of, and protect, defend and save harmless Operator from and against all claims, demands and causes of action of every kind and character arising from pollution or paints, solvents, and garbage, except unavoidable pollution from reserve pits, wholly in Contractor's possession and control and directly associated with Contractor's equipment and facilities.

(ii) Operator shall assume all responsibility for, including control and removal of, protect, defend, indemnify and save Contractor harmless from and against all claims, demands, and causes of action of every kind and character which may occur during the conduct of operations hereunder, including but not limited to, that which may result from fire, blowout, chemically treated drilling fluids, contaminated cuttings or cuttings, lost circulation and fish recovery materials and fluids. Operator's liability and indemnification of Contractor hereunder shall include the cost of controlling a blowout or well out of control, and the drilling of any relief well or wells, if necessary.

(iii) In the event a third party commits an act or omission which results in pollution or contamination for which either Contractor or Operator, for whom such party is performing work, is held to be legally liable, the responsibility therefor shall be considered, as between Contractor and Operator, to be the same as if the party for whom the work was performed had performed the same and all the obligations respecting defense, indemnity, holding harmless and limitation of responsibility and liability, as set forth in (i) and (ii) above, shall be specifically applied.

17.15 Termination of Location Liability: When Contractor has complied with all obligations of the Agreement regarding restoration of Operator's location, Operator shall thereafter be liable for damage to property, personal injury or death of any person which occurs as a result of condition of the location and Contractor shall be relieved of such liability; provided, however, if Contractor shall subsequently reenter upon the location for any reason, including removal of the rig, any term of the Agreement relating to such reentry activity shall become applicable during such period.

17.16 Consequential Damages: Neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of this Agreement, including, without limitation, loss of profit or business interruptions, however same may be caused.

17.17 Indemnity Obligation: Except as otherwise expressly limited herein, it is the intent of parties hereto that all indemnity obligations and/or liabilities assumed by such parties under terms of this Agreement, including without limitation, Articles 17.1 through 17.16 hereof, be without limit and negligence of the indemnified party or parties, whether such negligence be sole, joint or concurrent, active or passive. The mutual indemnities and companies. Such indemnification and assumptions of liability shall not be deemed to create any rights to indemnification in any person or entity not a indemnification between one of the parties hereto and another person or entity not a party to this Agreement.

17.18 (a) Governing Law - Severability: The terms and provisions of this Agreement and associated exhibits shall be construed under and governed by the laws of

(b) In the event any provision herein contained or contained in an associated Exhibit should be deemed inconsistent with or contrary to any Federal, State or Municipal law, rule or regulation, said provision shall be deemed to be modified to the extent required to comply with said law, rule or regulation and as so modified said provision and this Agreement shall continue in full force and effect without affecting the enforceability of the remaining provisions, duties, and liabilities set forth herein and in the associated Exhibit.
(c) Contractor and Operator agree to comply with all laws, rules, and regulations of any Federal, State, and Local government authority which are now, or may in the future become applicable to the operations covered by this Agreement or accruing out of the performance of such operations; provided, however, as between Operator and Contractor specific provisions herein contained respecting the risk and responsibility for such compliance shall be controlling. The terms of Exhibit B, attached hereto, shall apply to this agreement.

18. INDEPENDENT CONTRACTOR RELATIONSHIP:

In the performance of the work herein contemplated on a turnkey basis, Contractor is an independent contractor, with the authority to control and direct the performance of the details of the work. Operator being only interested in the final results obtained. The work on such turnkey basis shall meet the approval of Operator and be subject to the right of inspection and supervision herein provided. Operator shall not unreasonably withhold approval of all such work, when performed by Contractor in accordance with the generally accepted practices and methods customary in the industry.

19. NO WAIVER EXCEPT IN WRITING:

It is fully understood and agreed that none of the requirements of this Agreement shall be considered as waived by either party unless the same is done in writing.

20. FORCE MAJEURE:

Except for the duty to make payments hereunder when due, and the indemnification of provisions under this Agreement, neither Operator nor Contractor shall be responsible to the other for any delay, damage or failure caused by or occasioned by a Force Majeure Event. As used in this Agreement, "Force Majeure Event" includes: acts of God, acts of the elements, warlike action, insurrection, revolution or civil strife, piracy, civil war or hostile action, strikes, differences with workmen, acts of public enemies, federal or state laws, rules and regulations of any governmental authorities having jurisdiction in the premises or of any other group, organization or informal association (whether or not formally recognized as a government); inability to procure material, equipment or necessary labor in the open market, acute and unusual labor or material or equipment shortages, or any other causes (except financial) beyond the control of either party. Neither Operator nor Contractor shall be required against its will to adjust any labor or similar disputes except in accordance with applicable law. After such period of delay which continues for more than __________ consecutive days and prior to the expiration or termination of this Agreement, Operator shall pay Contractor the work stoppage rate specified in Article 4.5. Each party shall exercise reasonable diligence to remove any such cause of delay to the work. The foregoing notwithstanding, delays in the operation of the Drilling Unit caused solely by weather when the Drilling Unit is not otherwise prevented from operating is not considered to be a Force Majeure Event and the work stoppage rate as set forth in Article 4.5 shall be applicable. After such Force Majeure delay has continued for a period of __________ days, either party may elect to terminate this Agreement.

21. INFORMATION CONFIDENTIAL:

Upon written request by either party, information obtained in the course of drilling operations on this well, including, but not limited to depth, formations penetrated, the results of coring, testing, and surveying, shall be considered confidential and shall not be divulged by either party or its employees, to any other person, firm, or corporation.

22. SUBCONTRACTS BY OPERATOR:

Operator may employ other contractors to perform any of the operation or services to be provided or performed by it according to Exhibit "A".

23. ASSIGNMENT:

Neither party may assign this Agreement without the prior written consent of the other and prompt notice of any such intent to assign shall be given to the other party.

24. NOTICES AND PLACE OF PAYMENT:

All notices to be given with respect to this Agreement except otherwise provided for shall be given to Contractor and to Operator respectively at the addresses hereinabove shown. All sums payable hereunder to Contractor shall be payable at its address hereinabove shown unless otherwise specified herein.
25. CONFLICTS:
   In the event of any conflict between the provisions of this standard agreement and Exhibits A or B attached hereto and made a part hereof, the latter shall be controlling.

26. AUDIT:
   Contractor shall maintain true and correct records in connection with the services hereunder and all transactions related thereto and shall retain all such records for at least twenty-four (24) months following completion of this Agreement.
   Contractor shall not give any fee, commission, rebate or other thing of value to or for the benefit of any employee of Operator nor shall Contractor knowingly do business with any third party so as to benefit an employee of Operator.
   Operator may from time to time and at anytime within twenty-four (24) months of the termination of this Contract, make an audit of all records of Contractor in connection with payments made to Contractor for services hereunder. Upon completion of audit, Contractor shall return to Operator any amount by which the total payments to Contractor exceeds the amount due as established by the audit. Items of compensation such as fixed percentages or fixed lump sums shall not be subject to audit under this provision.

27. ACCEPTANCE OF AGREEMENT:
   The foregoing Agreement is agreed to and accepted by Operator this ______ day of ____________, 19______
   By: _____________________________________________
   Title: ___________________________________________

   The foregoing Agreement is accepted by undersigned as Contractor this ______ day of ____________, 19______ which is the effective date of this Agreement, subject to rig availability, and subject to all of its terms and provisions, with the understanding that it will not be binding upon Operator until Operator has noted its acceptance, and with the further understanding that unless said Agreement is thus executed by Operator within _______ days of the above date Contractor shall be in no manner bound by its signature thereto.
   By: _____________________________________________
   Title: ___________________________________________
APPENDIX F
THE DRILLING PROCESS

I. INTRODUCTION

The drilling of a well is a highly technical endeavor, requiring the coordination and cooperation of several players. Many things can and do go wrong. A detailed description of the drilling process is beyond the scope of this article; however, a brief summary of the steps that must be taken in drilling a well is helpful in understanding the risks inherent in the drilling business.691

Once the drilling contract has been executed, the first task is to transport the drilling rig to the drill site selected by the operator's geologists. This task ranges from routine and inexpensive in flat, open land, easily accessible by public roads, to extremely difficult and very expensive in mountainous, forested, marshy, and offshore locations. In the latter situations, several service contractors may be involved in providing access and transporting the rig and other equipment to the drill site.

At an onshore drill site, the site has to be surveyed and prepared, a reserve pit has to be dug and lined, and a water supply has to be secured. A small "rathole rig" may be used to set conductor pipe in the drill hole and to dig an adjacent "rathole" for the temporary storage of a section of pipe to be added to the drill string. Generally, conductor pipe is set to a depth of 20 to 100 feet to prevent damage to the hole and to serve as an initial guide for the drill bit. However, in some areas conductor pipe may be omitted.

II. THE DRILLING RIG AND RELATED EQUIPMENT

Once the main drilling rig (usually a "rotary" rig) reaches the drill site, "rigging up" is necessary. Rigging up consists of raising the rig to a vertical position over the drill-hole site and assembling the various rig components to ready the rig for "making hole." A rotary drilling rig is composed of four general components: power, housing, rotating, and circulating.692

The power component provides the energy necessary to operate the drilling rig. Today, the most common power system consists of several large diesel engines that drive generators providing electricity to drive

691. A more detailed and more fully illustrated explanation may be obtained from R. Baker, A PRIMER OF OILWELL DRILLING (4th ed. 1979).
692. Refer to Figure 1.
FIGURE 1. Illustrating a drill rig with its major components and related equipment. Reprinted with permission of the North Dakota Geological Survey.
the rig. On some rigs, the diesel engines directly and mechanically drive the rig. A few rigs are still powered by gasoline or natural gas engines.

The hoisting component, which raises and lowers the drilling equipment into and out of the hole, consists of the drawworks, derrick, crown and traveling blocks, and drilling line. The drawworks consist of a revolving drum, hoist, and related components. This drum serves as a spool for the drilling line. The derrick serves as the superstructure that supports the crown block at the top of the derrick and the traveling block which travels up and down the derrick. The drilling line is heavy cable that runs from the drum to the crown and traveling blocks; one end of the drilling line is anchored in the ground. The crown and traveling blocks are large pulleys, which, together with the drilling line, hold and guide the drilling equipment lowered into and lifted out of the hole. In essence, the hoisting component is a sophisticated, heavy-duty block and tackle.

The rotating component consists of the swivel, kelly, turntable (or rotary table), drill pipe, drill collars, and drill bit. The swivel is attached to the bottom of the traveling block. The swivel is designed to rotate and provide a high-pressure seal and passageway for drilling mud to enter the drill pipe.

The kelly is a heavy four- or six-sided pipe attached to the bottom of the swivel. The kelly is hollow to allow for passage of the drilling mud from the swivel through the kelly and into the drill pipe. The kelly travels through bushings attached to the turntable.

When supplied with power from the power component, the turntable rotates, and in turn rotates the bushings, kelly, swivel, drill pipe, and bit. The turntable also contains slips which hold the drill pipe in place when the kelly is removed.

The term “drill pipe” refers to standard lengths of steel pipe (usually thirty feet) that can be attached to each other to make a continuous length of pipe running between the kelly and the drill collars. The drill collars are heavier lengths of pipe which connect the lower end of the drill string (a series of drill pipe joined together) to the bit. Drill collars provide weight on the bit, forcing it to drill or grind its way into the ground. Like the kelly, drill pipe and drill collars are hollow to allow for the passage of drilling mud. During drilling operations, both drill pipe and drill collars are stacked vertically on the drilling platform for quick access and handling. There must be sufficient drill pipe and drill collars
on hand to form a continuous drill string or drill column from the kelly to the targeted depth of the well.

The most common type of rotary bit is a rock or cone bit. Each of the three cones are free to turn as the bit is rotated in the hole, and the bit has passages to permit the flow of drilling mud. As the bit is rotated and the cones turn, the teeth grind and cut through the formations. A diamond bit has no cones; instead, industrial diamonds, embedded in the bit, grind away at the formations as the bit is rotated.

The circulation system facilitates the use of drilling mud. Drilling mud or drilling fluid consists of a mixture of water or oil (or both), clay, ballast (commonly barite), and varying chemicals. The precise mixture varies with the drilling conditions. Drilling mud is pumped through the circulation system of a drilling rig to lubricate the drilling bit and drill pipe and to flush away the drill cuttings and carry them to the surface. In addition, drilling mud tends to seal the walls of the hole to prevent cave-ins, and its weight counteracts and controls underground pressures. Drilling mud is furnished by a service contractor commonly called a mud company.

A rig’s circulation component consists of many parts. The drilling mud is stored in the mud pit until the mud pump sucks the mud out of the pit and forces it through a discharge line, standpipe, and rotary hose into the swivel. The mud is then forced down the swivel, kelly, drill pipe, and drill collars and out holes in the bottom of the drilling bit. At this point, the drilling mud lubricates the bit and flushes away the drill cuttings. The mud and cuttings are forced back up the hole (annulus) into a return line and then onto a vibrating screen, called a shale shaker. The shale shaker separates the drill cuttings from the mud. The cuttings are dumped from the shaker into the reserve pit, and the mud passes through the screen and back into the mud pit where it can once again be pumped back down the hole.

Because the weight of drilling mud is calculated to control underground pressures, drilling mud serves as a blowout prevention device. In the event unexpected underground pressure is encountered, salt water, oil, or gas may be forced into the hole, causing mud suddenly to rise in the hole or to stop circulating. This is called a kick and can be an ominous warning of an impending blowout. If the kick cannot be controlled

693. Refer to Figure 2.
694. Refer to Figure 3.
695. Refer to Figure 4.
FIGURE 2. A conventional rock bit or cone bit. As the bit is rotated, the teeth on the cones turn and bite into the rock and chip off fragments. Drilling fluid passes through the bit to cool and to lubricate it and to carry the rock chips to the surface. Reprinted with permission of the North Dakota Geological Survey.

FIGURE 3. A diamond bit that is used for cutting a core out of the rock. It is used in conjunction with a core barrel. The surface of the bit is covered with industrial diamonds. The bit is hollow so that as it cuts into the rock, a core of rock is cut which passes through the bit and into the core barrel. Reprinted with permission of the North Dakota Geological Survey.
FIGURE 4. A diagram illustrating the drilling fluid (drilling mud) system and the flow of fluids through the system. Reprinted with permission of the North Dakota Geological Survey.
by adjusting the circulation, a series of blowout preventers (BOPs), which are high pressure valves, may be closed to seal off the hole to prevent a blowout. If the blowout preventers are closed, a choke manifold will allow limited and controlled circulation to occur, allowing heavier mud to be circulated into the hole forcing the kick (the salt water, oil, or gas) to be circulated out of the hole. When the well is brought under control, normal drilling operations may resume.

III. MAKING HOLE

Once the drill site has been prepared and rigging up has occurred, the drilling crew is ready to commence making hole. The crew will attach a drill bit to a drill collar and lower the bit and collar down the hole using the drawworks. Additional drill collars and drill pipe will be added and lowered down the hole. When the bit nears the bottom of the hole, the crew will add the kelly to the top of the drill string. At this point, the circulating system and turntable will be activated, and the drawworks will lower the drilling string until the bit touches the bottom of the hole. At this point, the well is making hole.

As the hole becomes deeper, the crew will periodically have to stop the turntable, shut off the mud pump, remove the kelly, and add another length of drill pipe. This is called making a connection and is repeated for each thirty feet of drilling—the length of one drill pipe.

Early in the drilling phase, surface casing must be run (inside the conductor pipe) and cemented into place. This is done to provide protection against cave-ins, to prevent drilling fluids from contaminating fresh water formations, to assist in keeping the hole straight and vertical, and to provide an anchor for production casing. Casing is generally set and cemented into place by a special casing crew, and cementing is generally done by a service contractor hired for that purpose. The failure of surface casing can cause groundwater pollution, loss of a hole, and loss or damage to equipment.

If casing must be run, if the drill bit needs changing, if equipment is lost down the hole, or if well tests are necessary, the crew must trip out (raise the drill string out of the hole). To accomplish this, the drill pipe and drill collars must be detached as they are hoisted out of the ground, generally in three-length segments, and stored vertically on the derrick.

To resume making hole, the crew must trip in (reassemble the drill...
FIGURE 5. Illustrating the casing of the surface hole to prevent the contamination of fresh water zones and to support the production casing. A. Conductor pipe has been cemented into place. A predetermined amount of casing has been inserted into the well bore below the deepest fresh water zone. Cement is pumped down the inside of the casing until cement flows to the surface through the annulus. B. The cement has hardened and both casing and cement have been tested under pressure. The cement in the bottom of the casing has been drilled out so that drilling can be resumed. Reprinted with permission of the North Dakota Geological Survey.
string and lower it down the hole). Once completed, the mud pump and turntable are engaged and the rig is again making hole.

Most drilling rigs are operated by a crew consisting of a toolpusher, driller, derrickman, and two to four roughnecks. In addition, there may be some maintenance personnel.

The toolpusher is the well-site supervisor of all drilling operations and the coordinator of all service contractors. As second in command, the driller operates the drilling equipment and supervises the remaining crew. The derrickman works at the top of the derrick during tripping out and tripping in. When the rig is making hole, the derrickman monitors the circulating component of the rig. The roughnecks perform several tasks on the drilling platform, including making connections, tripping out and tripping in, and general rig maintenance.

The operator will often have a company representative at the well site to make certain that the well is being drilled in accordance with the contract specifications. Under a daywork drilling contract, the company representative may supervise the drilling operations. However, under a turnkey contract, the company representative has little control over the actual drilling. In any event, the company representative (generally a “well-sitting” geologist or engineer) will most likely be present to examine the cuttings and to conduct or supervise the testing of the well. In addition, the company representative may be responsible for securing certain supplies and services incidental to the drilling and completion of the well.

The mud company, a service contractor hired to furnish the drilling mud, usually has a mud engineer at the well site to mix the mud in accordance with specifications and periodically to test the mud to make sure that the proper formulation is maintained. In addition, mud loggers may be on site to monitor the well cuttings.

IV. TESTING AND COMPLETION

The mud logger, well-sitting geologist, or engineer constantly gathers samples of well cuttings and examines them for a show of oil. In addition, another service company will provide well logs. A drill stem test can measure underground pressures and provide samples of the fluids present in the formation. Also, a coring device can be lowered down the hole to cut actual core samples from a formation.

Once total depth is reached and all tests are done, the operator must make a decision whether to plug and abandon the well or complete the
well as a producer. If the operator elects to complete the well, production casing has to be run and cemented in place through and beneath the producing formation. Then the casing, cement, and producing formations are perforated; in other words, holes are punched through the casing into the producing formation so that oil may flow into the production casing. A string of production tubing is run inside the production casing down to the top of the producing formation. A seal is placed near the bottom of the production tubing and between the production tubing and the production casing to force the oil into the production tubing. For a time, natural reservoir energy may drive the oil to the surface. At the surface a “Christmas tree” (a series of valves) is installed at the top of production tubing so that production can be controlled. At some point, perhaps even from the outset, natural reservoir energy will not be sufficient to drive the oil to the surface, necessitating the installation of a pump to lift the oil up the well bore.

When drilling, testing and plugging, or completion are accomplished and the drilling contractor has disassembled the drilling rig (rigging down), the drilling contractor has completed the drilling contract.

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697. Refer to Figure 6.
698. Refer to Figure 7.
699. Note that completion operations may be performed by someone other than the drilling contractor and with equipment that does not belong to the drilling contractor.
700. Though not a new process, horizontal drilling is being used extensively in some areas. This is a process wherein the hole is sharply deviated to allow the hole to penetrate the reservoir laterally for an extended distance. Generally, the horizontal portion of the drilling operation is conducted on a daywork basis.
FIGURE 6. Cementing production casing. A. Illustrates cement being pumped down the casing. The casing shoe facilitates the insertion of the casing into the bore hole. The float collar prevents drilling fluid from entering the casing. The bottom plug precedes the cement down the casing. The top plug follows the cement and precedes the displacement fluid. B. Illustrates the completed cementing operation. Reprinted with permission of the North Dakota Geological Survey.
Figure 7. Illustrating two types of well heads or "Christmas trees." The well head on the left is for a flowing well and the well head on the right is for a pumping well. Reprinted with permission of the North Dakota Geological Survey.