

Chapter 1

Overview of the Industry

The Industry's History

1.01 To gain an understanding of oil and gas producing activities, a brief review of the history of the industry is helpful. The following discussion is intended to be basic, and the interested reader is encouraged to refer to other available sources, as necessary.

Development of the Oil Industry

1.02 The first commercial oil drilling venture occurred near Titusville, Pennsylvania, in 1859. A steam powered, cable tool drilling rig, which lifted and dropped a heavy piece of metal to pound a hole into the earth, was used to drill a 59-foot well, which yielded 5 barrels of oil per day. At that time, the price of crude oil was about \$10 per barrel. This well set off a boom of sorts, and the cable tool drilling rig was used to drill other wells in the area. Oil soon sold for about \$0.10 per barrel because of the dramatic increase in supply.

1.03 In the 1850s and early 1860s, oil was used chiefly as fuel for lamps. The Industrial Revolution and the Civil War greatly increased the uses of oil and, therefore, the demand — so much so that annual production in 1870 exceeded 25 million barrels. Early transportation of crude oil was cumbersome, requiring (a) wooden barrels (each with a capacity of 42 gallons, which is the present measurement of a barrel of crude oil); (b) horse-drawn wagons; (c) river barges; and (d) the railroads. The first pipeline, completed in the 1860s, was made of wood and was less than 1,000 feet long.

1.04 One of the first persons to rise to power in this infant industry was John D. Rockefeller. In 1870, Rockefeller merged his firm with four others to form the Standard Oil Company. During the 1880s, Standard Oil dominated the global production industry and controlled approximately 90 percent of the refining industry in the United States. Standard Oil's market dominance eventually led to its forced dissolution in 1911 because of federal and state antitrust legislation that had been enacted as a response to its size.

1.05 The U.S. oil industry began exploration internationally (the Middle East, South America, Africa, and the Far East) in the 1920s as a result of increased demand. However, the East Texas oil field discovery of 1930 ultimately created an oil surplus that caused entities to cut back foreign operations. During and after World War II, the worldwide demand again increased, and enormous capital investments were made to develop the Persian Gulf area, other Middle East countries, Africa, South America, and the Far East.

1.06 In 1960, the Organization of Petroleum Exporting Countries (OPEC) was formed by five countries. The original founding members were Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela. The stated objective of the organization is to "coordinate and unify the policies of member countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry." Since that time, OPEC membership and

influence has continued to increase. The 2018 membership is shown in the following table:

<i>Country</i>	<i>Year Joined</i>	<i>Country</i>	<i>Year Joined</i>
Algeria	1969	Libya	1962
Angola	2007	Nigeria	1971
Ecuador	2007	Qatar	1961
Gabon	2016	Equatorial Guinea	2017
Iran	1960	Saudi Arabia	1960
Iraq	1960	United Arab Emirates	1967
Kuwait	1960	Venezuela	1960

The members of OPEC have controlled a substantial portion of the world's oil reserves, production, and excess productive capacity and, as a result, OPEC has been able to exercise a great deal of control over oil prices by decreasing or increasing the output of member nations through a production quota system.

1.07 Even with new technology and the emergence of shale oil and gas production in North America, the geopolitical landscape of OPEC's control of oil reserves has remained constant into recent years. Large oil reserves have been discovered in Africa, Russia and the former Soviet states, on-shore North America, the Gulf of Mexico, and the North Sea; however, OPEC members continue to have significant influence over the world oil market.

Development of the Natural Gas Industry

1.08 Natural gas demand increased significantly in the United States in the 1960s and has continued to increase, facilitated by improved transportation systems. In the United States, electricity generation, the growth of the petrochemical industry (which produces plastics and synthetics), and the heating of large scale office buildings create the primary demand for natural gas.

1.09 The use of natural gas has continued to grow throughout the world, although the lack of pipelines has impeded growth of production and consumption of natural gas in many areas of the world. One of the primary issues facing the international natural gas industry is that many of the largest discoveries are in countries that are remote from the primary consuming markets in North America, Europe, and Japan, as well as the growing markets in China and India. Efforts to resolve this issue have been made through the development of improved techniques for liquefying natural gas, converting natural gas to synthetic fuels, and transporting the resulting liquids, with liquefied natural gas playing a more critical role in worldwide supply and demand balance.

1.10 A recent important source of natural gas in the United States is shale gas, a natural gas that is found trapped within shale formations. Although shale gas is not new, the advancements of new technologies, such as horizontal drilling and hydraulic fracturing have enabled the exploration of unconventional resources. Since 1998, the date of the first economical shale fracture, natural gas from shale has been the fastest growing contributor to total primary energy in the United States and prompted other countries across the globe to

assess their unconventional natural gas resources. Shale gas contributed about 60 percent of total U.S. dry natural gas production in 2017, compared to only 1 percent in 2000. The U.S. Energy Information Administration estimates that in 2017 about 16.76 trillion cubic feet of gas was produced from shale resources. 1 trillion cubic feet of natural gas will heat approximately 15 million homes for one year, the equivalent of generating 100 billion kilowatt hours of electricity.

Prices for Oil and Gas

1.11 One of the most important factors in the development of the industry has been changes in oil and gas prices. The Arab oil embargo of 1973 focused public attention on the industry, largely because of its effect on previously stable prices. In 1973, before the embargo, the average barrel of crude oil sold for about \$3. By December 1973, crude oil prices had risen to over \$11 per barrel. In the United States, oil prices were placed under federal government control in late 1973. In 1975, the US congress passed the Energy Policy and Conservation act, which banned the export of crude oil which was lifted in December 2015 allowing for renewed oil exports.

1.12 In 1979, the Iranian revolution resulted in a sharp increase in oil prices to \$42 per barrel. In late 1979, the U.S. government announced "phased decontrol" of oil prices, and in January 1981, all price controls on crude oil were lifted. Natural gas prices continued to be subject to controls created by the Natural Gas Policy Act of 1978, but initial deregulation of gas prices began on January 1, 1985, with complete deregulation occurring on January 1, 2003.

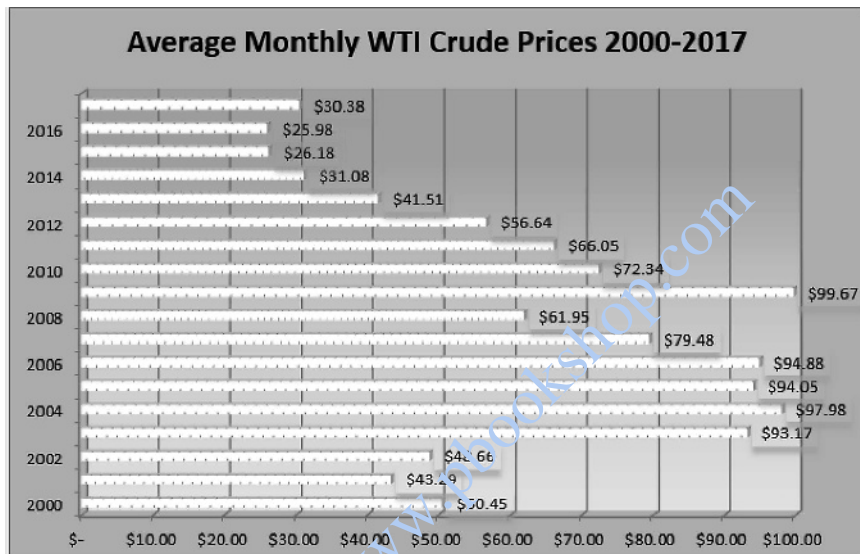
1.13 By the early 1980s, the price for a barrel of oil ranged from \$30 to \$40 (and sometimes higher), but prices declined in the mid-1980s in the face of a world oil surplus. These fluctuations were further complicated by the U.S. government's earlier price controls that designated different prices for different grades of oil and created a complex pricing structure. As a result, producing entities grew increasingly reluctant to explore and drill. This reluctance may have stemmed from the fact that a barrel of domestically produced oil often had a sale price significantly less than the price of imported oil. In the decades of the 1990s and 2000s, crude oil prices have fluctuated from a low of \$13 per barrel to a high well in excess of \$100 per barrel. North American natural gas prices also have fluctuated significantly, ranging from a low of about \$1 per million British thermal units (MMBTUs) in 1992 to more than \$15 per MMBTUs in late 2005. Since that date, natural gas prices have continued to fluctuate. As a result of the increase in supply of shale gas production, for the past several years they have been below \$3 per MMBTU.

Recent Developments in the Oil and Gas Industry

1.14 *Increase in demand.* For a number of years, countries like China and India have seen double-digit demand growth and are expected to continue growing at a high pace. The rapid economic expansion in much of the world, including China and India, has led to increased demands for energy and changes in the competition for new hydrocarbon resources. In particular, China and India are actively pursuing opportunities in their geographic region, as well as in Africa and South America.

1.15 The decline in traditional sources of natural gas in Western Europe, together with Russia's significant oil and gas reserves, have led to an increased dependence in Western Europe on the supply of hydrocarbons (especially gas) from Russia.

1.16 Problems with supply of hydrocarbons. In recent years, the global crude oil market supply has seen a number of disruptions. These include war and security issues in the Middle East (particularly Iran and Iraq) and political issues in Russia, the newer republics of the former Soviet Union, Nigeria, and Venezuela. These factors, combined with a weaker dollar (global oil trade is primarily dollar based), have led to instability in oil prices beginning in 2015 when crude oil prices began to drop sharply lower. Crude prices rebounded in the first half of 2018 in part due to production limits imposed by OPEC member nations, continued political instability in Libya, and U.S sanctions imposed on Venezuela.



1.17 New opportunities — offshore drilling. Although offshore wells were drilled before 1900, including the use of piers and pilings in the Baku region of Azerbaijan in the Caspian Sea and piers extending into the Pacific Ocean in California, significant technological advancements have occurred in recent years. Such technology allows wells to be drilled in water depths greater than 9,000 feet and over 175 miles from shore. In more recent times, companies have invested billions of dollars in deep water drilling projects off the coasts of Africa, Australia, Brazil, the U.S. Gulf of Mexico, and the North Sea. Africa remains a bright spot for hydrocarbon opportunities. Offshore West Africa has been one of the most active areas in the world for new discoveries and significant projects. The oil discoveries have been sizeable, and the offshore operating conditions have been relatively mild and, due to the distance from the shore, somewhat insulated from the political and security unrest that occurs in onshore areas. In addition, significant hydrocarbon discoveries have been made in Offshore East Africa, as well as in the Mediterranean Sea.

1.18 Further development of offshore technologies. Offshore drilling and production technology has advanced at a steady pace. For many decades, offshore oil and gas operations were restricted primarily to platforms affixed to the seafloor, with some limited use of subsea wells tied back to those platforms. Platform costs increase rapidly with water depth, but floating platform

concepts, such as tension leg platforms and spars, have been used successfully in deeper water. Deepwater discoveries are now being developed with subsea wells with production being piped either to floating production, storage, and offloading tankers; central production hubs serving multiple fields; or directly to shore.

1.19 *Alternative sources of hydrocarbons.* As markets and producers have reacted to imbalances in demand and supply, the perceived need for alternative sources of energy also has boosted the prospects for alternative production techniques and technology. As a result, resources produced from oil sands, oil shales, coal, and several improved recovery techniques have become more important sources of hydrocarbons in recent years. Activities to extract these alternative or nontraditional resources are now considered to be oil and gas producing activities under the new oil and gas reporting requirements of the SEC and, therefore, hydrocarbons extracted from oil sands, shales, coal beds, and other nonrenewable natural resources, which are intended to be upgraded into synthetic oil or gas, are now deemed to be oil and gas reserves.

1.20 *Modernization of oil and gas reporting.* On December 31, 2008 (effective fiscal 2010), the SEC issued Final Rule No. 33-8995, *Modernization of Oil and Gas Reporting*, adopting revisions to oil and gas reporting requirements and disclosures that existed in Regulation S-K under the Securities Act of 1933 and in Regulation S-X under the Securities Exchange Act of 1934. The Final Rule also eliminated Industry Guide 2 and incorporated certain of these disclosure requirements in Subpart 1200 of Regulation S-K. In 2010, FASB issued Accounting Standards Update (ASU) No. 2010-03, *Extractive Activities—Oil and Gas (Topic 932): Oil and Gas Reserve Estimation and Disclosures*. ASU No. 2010-03 includes changes to accounting and disclosure requirements that are consistent with SEC Final Rule 33-8995.

Origin and Accumulation of Oil and Gas

1.21 An oil or gas reservoir is often erroneously viewed as a large cave containing liquids or gas beneath the earth, like a subterranean pond. In reality, an oil or gas reservoir is porous rock capable of containing oil, gas, or water in the microscopic pore spaces of the rock. For an oil or gas reservoir to be formed, the following features must be present:

- There must have been an original source bed of organic material subjected to the proper temperature and pressure over sufficient time.
- There must be a reservoir rock filled with pores (having porosity) so the oil, gas, or both, can collect.
- The rock's pores must be interconnected (having permeability) so the oil or gas can move or migrate.
- There must be a trap that will cause the oil or gas to collect and prevent the hydrocarbons from moving upward.

1.22 Oil and gas originated from organic matter in sedimentary rocks. Layer upon layer of sediment and animal and plant deposits were buried successively until the accumulation became thick, sometimes thousands of feet. Bacteria took oxygen from the trapped organic residues and gradually broke down the matter into substances rich in carbon and hydrogen. The weight created high pressure and temperature, compacted and squeezed the sediment

into hard shales, turned the organic material into oil and gas, and expelled the oil and gas from the shale into porous and permeable reservoir beds.

1.23 Source rocks, in which the organic material was originally trapped, are fine grained and relatively impermeable. The oil and gas normally move from the source rock into more porous rocks; they then migrate upward through the porous rocks until reaching a structural closure or an impermeable barrier. These closures and barriers are called *traps*, and they cause oil and gas to accumulate into a pool or field.

1.24 Oil and gas traps may be classified in several different ways. One commonly used system for classifying traps is based on the one of two ways in which they were formed: (a) structural traps and (b) stratigraphic traps.

1.25 Structural traps formed by vertical or horizontal movement, or both, in the earth's crust, are the most important sources of hydrocarbons. A common structural trap is the anticline, which has been the most productive type of structure for oil and gas production. An anticline is a dome usually formed by upthrusts from below. Anticlines containing oil and gas are covered by an impervious cap rock layer. Oil, gas, and water migrate upward through porous layers until they reach the cap rock and are trapped.

1.26 Another structural trap of special importance as a source of oil and gas is the fault. Faults are created by shifts in the earth's crust that cause a porous strata containing hydrocarbons to shift and break so that a strata on one side of the fault is higher than the strata on the other side of the break. At the fault line, the strata containing hydrocarbons is sealed off by an impervious layer, trapping the oil, gas, and water.

1.27 A third common form of a structural trap is the salt dome. In these structures, a nonporous salt bed pushes upward and pierces porous strata, causing an uplifting of the strata and faults along the sides of the dome. Also, some of the impervious overriding formations are merely bent, creating anticlines at the top of the domes. Both faults and anticlines are excellent traps for hydrocarbons.

1.28 Another common structural trap is an unconformity or truncation trap, in which a portion of reservoir strata has been eroded away and replaced with impermeable sediments to form a trap. Different forms of truncation are involved in the large oil fields in Saudi Arabia and the Prudhoe Bay field in Alaska.

1.29 Stratigraphic traps are created by abrupt changes in the porosity of the strata. Areas of strata containing oil and gas may be cut off by irregular dispositions of sand and shale or changes in the rocks in the strata, causing the oil and gas to be trapped.

Oil and Gas Reserves

1.30 The discovery and preparation for production of oil and gas reserves is the primary objective of exploration and development activities. In addition, reserve information is critical to an oil and gas producer's financial statements.

1.31 Historically, only reserves classified as proved were disclosed in accordance with accounting principles generally accepted in the United States of America (GAAP) and the disclosure requirements of the SEC. However, for internal purposes, entities generally identify proved and unproved categories of

reserves. The most common additional categories are known as *probable* and *possible reserves*. In connection with the SEC reporting requirements contained in Final Rule No. 33-8995, probable and possible reserves are now permitted (although not required) to be disclosed outside of the financial statements in filings with the SEC. Proved reserves are required to be disclosed in accordance with the disclosure requirements of the SEC.

1.32 Reserve determinations have a significant effect on an entity's results of operations and financial position because they are used in the calculation of the amortization of capitalized costs, the assessment of impairments, and the estimation of the timing of settlements of asset retirement obligations. GAAP generally requires that only proved reserves be used for accounting purposes (such as the amortization of capitalized costs.) However, probable and possible reserves are used (after adjusting for the risk of uncertainty of existence) in evaluating impairment of oil and gas properties for entities following the successful efforts method of accounting. Such reserves also are used in the determination of the fair value of assets in acquisition and disposition transactions.

The SEC's Definition of *Proved Reserves*

1.33 The definition of *proved reserves* used by the SEC is found in Final Rule 33-8995 and FASB ASC 932. This definition is the only definition currently acceptable under both the successful efforts method and the full cost method of accounting when preparing financial statements and disclosures in accordance with GAAP.

1.34 Determination of proved reserves is based on whether the estimated oil and gas quantities are reasonably certain to be recoverable under existing economic and operating conditions. The concept of reasonable certainty of recovery under existing economic and operating conditions is subject to many interpretations and judgments, including, but not limited to, having the necessary transportation infrastructure; the existence of a market or market arrangements, or both; sufficient resources to fund development costs; and other criteria, each of which would need to be addressed. The inability of an entity to demonstrate that these criteria are reasonably certain to occur may affect its ability to recognize proved reserves.

1.35 Certain key terms used in the definition of *proved reserves* include the following:

- The economic recoverability assessment of proved reserves is based on a 12-month average price used to determine reserves (including proved reserves), calculated as the unweighted arithmetic average of the first day of the month price for each month within the company's 12-month period prior to the end of the reporting period, unless prices are affected by contractual arrangements, as defined.
- The definition of *oil and gas producing activities* includes the extraction of nontraditional resources, such as bitumen extracted from oil sands and hydrocarbons extracted from coal beds and shales, which are intended to be upgraded into synthetic oil or gas.
- The use of new reliable technologies is allowed to establish proved, probable, and possible reserve estimates. *Reliable technology* is defined as technology (including computational methods) that has

been field tested and has demonstrated consistency and repeatability in the formation being evaluated or in an analogous formation.

Additional SEC staff guidance related to the determination of reserves can be found on the SEC's website at www.sec.gov/divisions/corpfin/guidance/oilandgas-interp.htm. This guidance is in the form of Compliance and Disclosure Interpretations (C&DIs) on the oil and gas rule of the SEC. These C&DIs comprise the interpretations of the SEC's Division of Corporation Finance.

The SEC reporting requirements contained in Final Rule No. 33-8995 also can be found on the SEC's website at www.sec.gov/rules/final/2008/33-8995.pdf.

1.36 Proved, probable, and possible reserves can be classified as *developed* and *undeveloped*, in accordance with the following definitions:

- *Developed oil and gas reserves* are reserves of any category that can be expected to be recovered
 - through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well and
 - through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.
- *Undeveloped oil and gas reserves* are reserves of any category that are expected to be recovered from new wells on undrilled acreage or from existing wells where a relatively major expenditure is required for recompletion.

1.37 The SEC definition of *undeveloped oil and gas reserves* includes the following provision: "Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances justify a longer time."

In addition, the disclosures required under Item 1203 of Subpart 1200 of Regulation S-K require disclosure for proved undeveloped reserves, including the reasons why material amounts of proved undeveloped reserves have remained undeveloped for five years or more after disclosure as proved undeveloped reserves. See the "SEC Disclosures—Subpart 1200 of Regulation S-K" section of chapter 4, "Successful Efforts Method and General Accounting for Oil and Gas Activities," for further information regarding disclosure requirements. Additional guidance related to the definition of *undeveloped oil and gas reserves* has been provided by the SEC in Section 131 of its C&DIs. In particular, question 131.03 provides guidance regarding the SEC's views about the "specific circumstances" that would justify a time period longer than five years to begin development of proved undeveloped reserves.

The Society of Petroleum Engineers' Definitions of Reserves

1.38 In March 2007, the Society of Petroleum Engineers, the World Petroleum Council, the American Association of Petroleum Geologists, and the Society of Petroleum Evaluation Engineers announced a new framework for determining oil and gas resources: the Petroleum Resources Management System

(PRMS). The PRMS provides a definition for *proved reserves*, as well as other resource categories, such as *probable* and *possible reserves*. The PRMS definitions are not acceptable for use in the preparation of financial statements in accordance with GAAP; however, entities may utilize them for internal purposes. The PRMS defines *proved reserves* as

those quantities of petroleum, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under defined economic conditions, operating methods, and government regulations. If deterministic methods are used, the term reasonable certainty is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate.

1.39 Historically, although the PRMS and SEC definitions of *proved reserves* were consistent across many areas, certain differences did exist between the two sets of definitions. The SEC definitions provided in Final Rule No. 33-8995 were significantly influenced by the PRMS and have eliminated some of these historical differences. However, differences do remain, including the fact that proved reserves under the PRMS are determined based on management's "defined" economic and operating conditions (that is, management's own pricing assumptions) as opposed to the "existing" economic and operating conditions required by the SEC (that is, historical 12-month average). Many companies still use the PRMS definition in their own internal reserves analyses.

1.40 For further information, readers can refer to the 2007 PRMS on the SPE's website at www.spe.org/industry/docs/Petroleum_Resources_Management_System_2007.pdf.

Determination of Reserves

1.41 Reserve estimates are prepared by persons with the requisite specialized knowledge and experience to estimate oil and gas reserve quantities, such as petroleum reservoir engineers and geologists. The reserve estimators may either be employees of the oil and gas entity or consulting engineers. When reserve estimates are prepared by employees of the entity, consulting engineers will often be hired to audit or review the estimates.

1.42 The assumptions that may vary include fixed or escalated prices, different price and cost scenarios, different development scenarios, probability based or deterministic methods of reserves estimates, and so on.

1.43 Reserve estimates or studies are widely used in managerial decisions. They also are used in financial statement information or supplemental disclosures to the financial statements. The most common uses are the following:

- A basis for computing the depreciation, depletion, and amortization rates used
- A basis to assign capitalized costs to oil and gas properties
- Disclosure of proved reserve quantities and discounted present value of future net cash flows information about a producing entity's proved reserves, in accordance with GAAP for publicly traded entities

- A basis for preparing cost ceiling test calculations for entities following the full cost method of accounting
- Undiscounted and discounted cash flow calculations for asset impairment purposes for entities following the successful efforts method of accounting

1.44 The initial evaluation of a well or wells is made to determine whether sufficient reserves have been discovered to justify developing the property. This evaluation is usually prepared by employees of the entity based on well log and formation core data, drill stem tests, and other available information.

1.45 Oil and gas entities should revise reserve estimates at least annually or whenever an indication of the need for revision exists, such as significant differences in actual production versus earlier estimates, changes in ownership, or significant decreases in cash flows.

1.46 The following is only a part of the supply of information that may be used to develop reserve quantity information:

- Area and thickness of the productive zone
- Porosity of the reservoir rock
- Permeability of the reservoir rock to fluids
- Oil, gas, and water saturation
- Physical characteristics of oil and gas
- Depth to the producing formation
- Reservoir pressure and temperature
- Production history of the reservoir
- Ownership of the oil and gas property

1.47 The methods used to estimate recoverable reserves vary with the amount and nature of the preceding information that is available. Estimates of the reserve quantities that are economically recoverable are made for internal use. Estimates for internal use may be based on estimated selling prices, development costs, and production costs; however, those used for financial reporting purposes are required to be based on historical prices and production costs, as required by the SEC.

1.48 *Precision of estimates.* According to the SPE, the reliability of reserve information is affected considerably by several factors. It is important to note that reserve information is imprecise because of the inherent uncertainties in, and the limited nature of, the data upon which the reserve estimate is predicated. Moreover, the methods and data used in estimating reserve information are necessarily often indirect or analogical in character rather than direct or deductive. The persons estimating reserve information make numerous judgments based solely on their educational background, training, and experience. The extent and significance of the judgments to be made are, in themselves, sufficient to render reserve information inherently imprecise.

Operations in the Upstream Petroleum Industry

1.49 Financial statements of an oil and gas producing entity will include many transactions and accounts not commonly found in other types of economic enterprises. This is a result of the unique nature of the principal assets — oil

and gas reserves — and the ways in which these reserves are acquired, developed, and produced. The high risks and high costs of acquiring, developing, and producing oil and gas and the unique nature of the ownership rights result in unique contractual relationships between oil and gas producing entities and owners of mineral rights. Chapter 2, "Primary Business Activities of the Industry," provides fundamental information about the most important contracts and operations encountered in the United States. Some of the most important contracts frequently encountered in petroleum activities in other countries are discussed in greater detail in chapter 6, "Accounting for International Oil and Gas Activities."

1.50 Operating activities in the oil and gas industry are commonly divided into the following categories: upstream activities and midstream and downstream activities. Upstream activities, which are the subject of this guide, may be broadly described as the following:

- Acquiring mineral rights
- Exploring for oil and gas
- Drilling wells and installing production equipment
- Lifting the oil, gas, and water from the wells to the surface
- Separating the oil, gas, and water sufficiently to prepare the hydrocarbons for transport to pipelines or oil refineries

Midstream and downstream activities include the following:

- Transporting the petroleum from the producing wells to the processing plants and refineries
- Refining and processing activities necessary to produce marketable products, such as natural gas, gasoline, and petrochemicals
- Transporting, distributing, and storing the refined products
- Marketing activities, which get the refined products, natural gas liquids, and natural gas into the hands of consumers

The activities involved in transporting the petroleum to processing plants and refineries are generally referred to as *midstream activities*, and the other activities are generally referred to as *downstream activities*.

1.51 Entities engaged in both upstream and downstream activities are referred to as *vertically integrated entities*, with the largest of these integrated entities often referred to as *majors*. A common term used in the industry to describe entities solely or primarily engaged in upstream activities is *independents*.

1.52 Within the petroleum industry, there have been continuing changes in entity structures and identities. Throughout the industry, mergers and acquisitions occur at all size levels. These transactions are entered into in order to acquire reserves, gain efficiencies, reduce costs, and gain operations in new areas.

1.53 The accounting and auditing principles and procedures related to refining activities, most gas processing activities, petrochemical operations, distribution, storage, and retail marketing activities are similar to those applicable to other manufacturing and marketing activities. As a result, this guide deals almost solely with accounting for, and reporting on, upstream activities, with only limited discussion of other related industry activities.

Oil Sands

1.54 Beginning in the late 1990s and early 2000s, the industry began to partner with joint venture partners in Canada in order to develop oil sand deposits. Potentially, oil sand projects can have a productive life that covers multiple decades. Many of these nonconventional operations involve the production of bitumen, which is transported from the mining operation via pipeline to an upgrader or directly to a refinery that processes heavy oil. An upgrader processes the bitumen into a lighter degree of synthetic crude oil that can be sold to the marketplace as-is or further refined and converted into an array of refined products. Bitumen is a tar-like form of crude petroleum that is so viscous that it must be heated before it will flow.

1.55 The production techniques used to extract bitumen can be a mixture of nonconventional production techniques (referred to as *truck and shovel* or *surface mining* operations) and conventional drilling techniques, such as steam assisted gravity drainage (SAGD or in-situ operations). The surface mining operations can be used to recover only a certain percentage of the total resource volume. Conventional drilling techniques, such as SAGD, are applied in order to produce the resource volumes that are located on deeper horizons and not available for the mining type of production. Historically, oil and gas entities have accounted for and disclosed truck and shovel operations as mining activities and SAGD operations as oil and gas producing activities.

1.56 In SEC Rule No. 33-8995 and ASU No. 2010-03, the definition of *oil- and gas-producing activities* was expanded to include the extraction of saleable hydrocarbons, in the solid, liquid, or gaseous state, from oil sands, shale, coalbeds, or other nonrenewable natural resources that are intended to be upgraded into synthetic oil or gas, and activities undertaken with a view to such extraction. Accordingly, the accounting guidance for nonconventional production meeting the preceding criteria are now within the scope of FASB *Accounting Standards Codification (ASC) 932, Extractive Activities—Oil and Gas*.

Sources of Capital and Organizational Structure of Oil and Gas Entities

1.57 Oil and gas producing entities require large amounts of capital, especially in their exploration and development activities. As in most industries, the traditional sources of capital are internal financing and equity and other forms of external financing. However, the various and sometimes unique adaptations in the oil and gas industry warrant discussion.

1.58 In the past, oil and gas entities, especially those that were large and financially strong, were able to fund a large amount of their exploration and development activities with internally generated funds. Increased competition among entities for exploration rights to undeveloped properties, increased risks related to exploration and development of oil and gas properties, as well as rising acquisition and development costs, have resulted in entities turning more frequently to external sources of funds.

1.59 Oil and gas entities use a variety of ownership arrangements for sharing risks. These arrangements may be in the form of undivided interests, unincorporated entities (joint ventures), corporations, limited liability companies, partnerships, and others. The oil and gas entity determines the appropriate

method to account for these varied ownership arrangements. This involves determining whether consolidation, equity method accounting, cost basis accounting, or proportional consolidation are applicable, based on the specific facts and circumstances. See chapter 3, "Accounting for Common Oil and Gas Ownership Arrangements," of this guide for a discussion of accounting for common oil and gas arrangements.

Joint Interest Arrangements

1.60 Entities often enter into arrangements with others as a means of raising or sharing capital. This can be done by creating joint operations, often in the form of joint ventures or partnerships, and is often accomplished by transferring a portion of the working interest to other parties. Depending on the attractiveness of the property and the owner's willingness to dilute its interest, a portion of the costs of a property may be financed in this manner. An example is a carried interest arrangement, in which one party agrees to incur all the costs to develop and operate a property but maintains the right to recapture its costs or a defined greater amount from the proceeds of production. Such arrangements in which parties bear disproportionate costs are often referred to as *promotes*. See chapter 2 of this guide for information regarding joint interest arrangements.

Limited Partnerships¹

1.61 Oil and gas operators may organize limited partnerships or limited liability companies taxed as limited partnerships. These legal entity partnerships are commonly called *oil and gas funds*, *oil and gas program funds*, or *oil and gas drilling funds*. Limited partnerships may be organized by a sponsor, who sells interests in the partnership to private investors and then acts as the general partner when the partnership has been organized. Limited partnerships are often structured to maximize the tax deductions passed through to the limited partners or provide current yield for larger institutional investors. The limited partners are usually liable only for the amount of their contribution to the partnership. The general partner normally has unlimited liability for the debts and obligations above the limited partners' capital; however, the general partner has full control over the partnership's operations and receives a management fee for their services.

1.62 The limited partnership is governed by the partnership agreement, which explains the rights and obligations of the partners. The partnership agreement specifies the method of allocating revenues and expenses between the general and limited partner interests. The basic allocation methods are functional allocation, reversionary interest, promoted interest, and carried interest. The entity analyzes the substance of the transaction and the details of the partnership agreement to determine the proper accounting treatment. Methods for special allocation of profits and costs for tax purposes may be inappropriate for financial reporting purposes.

1.63 Aside from the differences in the equity section of the financial statements and the allocation of revenues and costs between the general and limited partners, the accounting for, and the auditing of, an oil and gas limited partnership are basically the same as for any other oil and gas producer. However,

¹ For guidance on earnings per unit calculations for master limited partnerships with incentive distribution rights, refer to the "Master Limited Partnerships" subsections of FASB *Accounting Standards Codification* 260-10.

financial statements are often prepared on either the income tax or cash basis, except for those limited partnerships that are issuers, which are required to be prepared on the basis of GAAP.

Royalty Trusts

1.64 *SEC Codification of Staff Accounting Bulletins* Topic 12(E), "Financial Statements of Royalty Trusts," addresses the reporting requirements for royalty trusts, which file financial statements with the SEC. A royalty trust is typically created by a company conveying a net profits interest in certain of its oil and gas properties to the newly created trust. The trust then distributes trust units to its unitholders. The trust is a passive entity, usually with a defined term of existence, which is prohibited from entering into or engaging in any business or commercial activity of any kind and from acquiring any oil and gas lease, royalty, or other mineral interest. The function of the trust is to serve as an agent to distribute the income from the net profits interest. The amount to be periodically distributed to the unitholders is defined in the trust agreement and is typically determined based on the cash received from the net profits interest less expenses of the trustee. Royalty trusts typically report their earnings on the basis of cash distributions to unitholders. The net profits interest paid to the trust for any month is based on production from a preceding month; therefore, the method of accounting followed by the trust is different from the accrual accounting method that would have been followed by the creating company.

1.65 *SEC Codification of Staff Accounting Bulletins* Topic 12(E) states that the SEC staff will accept a statement of distributable income, which reflects the amounts to be distributed for the period under the terms of the trust agreement in lieu of a statement of income prepared under GAAP. *SEC Codification of Staff Accounting Bulletins* Topic 12(E) further states that this position is due to the SEC staff's belief that the item of primary importance to the reader of the financial statements of the royalty trust is the amount of the cash distributions to the unitholders for the period reported. Should there be any change in the nature of the trust's operations due to revisions in the tax laws or other factors, the SEC staff's interpretation would be reexamined. In cases in which this presentation is used, a note to the financial statements should disclose the method used in determining distributable income and should also describe how distributable income, as reported, differs from income determined on the basis of GAAP.

Other Sources of Capital

1.66 Quite common are various forms of production payment and net profit interest transactions, whereby an investor advances funds to be repaid from future production. See the "Frequently Encountered Transactions for Transferring Mineral Interests" section in chapter 2 for further discussion of these types of arrangements.

History of Accounting for Oil and Gas Producing Activities

1.67 Two accounting methods are acceptable for use by oil and gas producers: the successful efforts method and the full cost method. The accounting requirements for these two methods are discussed in separate chapters of this guide. In addition, appendix A, "Summary of the Successful Efforts and Full Cost Methods of Accounting," of this guide provides a high level comparison

of the two methods. The following discussion summarizes the development of GAAP for oil and gas entities.

1.68 Prior to the mid-1950s, most oil and gas entities used the successful efforts accounting method or some variation thereof. In the mid-1950s, a form of the full cost method of accounting was introduced that became popular with small, newly formed entities because it allowed for the deferral of costs until successful exploration produced offsetting revenue. By 1970, almost half of the public oil and gas producing entities were using a form of the full cost method.

1.69 In 1969, the AICPA called for the elimination of the full cost method and recommended that the successful efforts method be the only acceptable method. The Accounting Principles Board (APB) appointed a committee to develop an authoritative opinion on financial accounting and reporting for the oil and gas industry; however, the APB was disbanded in 1973 before the committee completed its charge.

1.70 In December 1977, FASB issued guidance that required a form of successful efforts accounting as the uniform method for all enterprises engaged in oil and gas producing activities.

1.71 The SEC called for public hearings in August 1978 before adopting FASB Statement No. 19, *Financial Accounting and Reporting by Oil and Gas Producing Companies*, as the authoritative standard of accounting and reporting for oil and gas producing entities filing reports with the SEC. Because of the strong opposition voiced at those hearings, the SEC issued Accounting Series Release (ASR) No. 253, *Adoption of Requirements for Financial Accounting and Reporting Practices for Oil and Gas Producing Activities*. ASR No. 253

- adopted the form of successful efforts accounting and the disclosures prescribed by FASB.
- indicated the SEC's intention to develop a form of the full cost accounting method as an acceptable alternative for SEC reporting purposes (ASR No. 258, *Oil and Gas Producers—Full Cost Accounting Practices*).
- concluded that both the full cost and successful efforts methods of accounting, based on historical costs, fail to provide sufficient information on the financial position and operating results of oil and gas producing entities and, accordingly, that steps should be taken to develop an accounting method based on a valuation of proved oil and gas reserves. (The SEC later decided that the valuation accounting it proposed — reserve recognition accounting — was no longer considered to be a potential method of accounting in the primary financial statements of oil and gas producers.)
- adopted rules that require financial statement disclosure of certain financial and operating data, regardless of the method of accounting followed.

1.72 In ASR No. 257, *Requirements for Financial Accounting and Reporting Practices for Oil and Gas Producing Activities*, and ASR No. 258, the SEC released its final rules for successful efforts and full cost accounting. As a result, entities under SEC jurisdiction could follow either the full cost method prescribed in Section 406.01.c of ASR No. 258 or the successful efforts method prescribed in Section 406.01.b of ASR No. 253, as modified by Section 406 of ASR No. 257, which is a method identical to that contained in FASB's guidance.

1.73 In response to the SEC's issuance of ASR No. 253, FASB issued additional guidance that suspended most of the provisions of its successful efforts accounting guidance for an indefinite period. However, some provisions of the successful efforts accounting guidance, including the accounting for deferred income taxes and some aspects of property conveyances and disclosure requirements, were retained and became effective. Thus, entities that report to the SEC may follow either accounting method. Nonpublic entities have no prescribed method of accounting for oil and gas producing entities. However, the Financial Reporting Executive Committee (FinREC) believes that nonpublic entities engaged in oil and gas producing activities should apply either the successful efforts method established by FASB or the full cost method established by the SEC because these are the only comprehensive methods of accounting developed for oil and gas producing entities. FinREC also recommends that any nonpublic entity that chooses to follow a method that varies from one of these methods should disclose in the notes to its financial statements any differences between the accounting policies it follows and those established by FASB or the SEC relating to oil and gas producing activities.

1.74 In November 1982, FASB issued guidance establishing disclosures to be made about oil and gas producing activities for publicly traded enterprises when presenting a complete set of annual financial statements. The SEC generally adopted these disclosure standards in Section 406.02 of Financial Reporting Release No. 9, *Supplemental Disclosures in Oil and Gas Producing Activities*.

1.75 The SEC reporting requirements contained in Final Rule No. 33-8995 revised the disclosure requirements for oil and gas reserves, in addition to changing the definition and requirements related to the determination of the quantities of oil and gas reserves. The SEC reporting requirements contained in Final Rule No. 33-8995 also changed certain accounting requirements under the full cost method of accounting for oil and gas activities. On January 6, 2010, FASB issued ASU No. 2010-03. ASU No. 2010-03 includes changes to accounting and disclosure requirements that are consistent with SEC Final Rule 33-8995.

1.76 For purposes of this guide, *successful efforts* refers to the accounting method specified in FASB ASC 932-360, and *full cost* refers to the accounting method specified in Rule 4-10(c) of Regulation S-X.

International Standards of Accounting for Oil and Gas

1.77 The International Accounting Standards Board (IASB) has established an accounting framework alternative that includes International Accounting Standards, International Financial Reporting Standards (IFRSs), and interpretations. The accounting framework established by the IASB does not have comprehensive accounting standards that would specifically address accounting for extractive industries, including oil and gas activities. IFRS 6, *Exploration for and Evaluation of Mineral Resources*, addresses accounting for the exploration stage of oil and gas and mining activities. Other operations and transactions related to oil and gas activities should follow the overall accounting framework established by the IASB. Further development of accounting standards under IFRSs is in progress. The IASB has initiated an extractive activities research project, which is expected to address the matters related to

accounting and financial reporting of reserves and resources in the extractive industries, as well as other extractive industry accounting issues.

1.78 Currently, oil and gas companies preparing financial statements under IFRSs as issued by the IASB may adopt accounting policies different from those under GAAP as long as the accounting policies follow the overall accounting framework of the IFRSs.² However, entities that file reports with the SEC continue to provide disclosures required by FASB ASC 932-235-50. For further information, refer to the IASB website at www.ifrs.org.

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² The SEC reporting requirements contained in Final Rule No. 33-8995, *Modernization of Oil and Gas Reporting*, revised Form 20-F to incorporate Subpart 1200 of Regulation S-K, with respect to oil and gas disclosures, and delete appendix A of item 4.D in Form 20-F (which previously required significantly less oil and gas reserves disclosure for foreign private issuers versus domestic filers).

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