

H-3070-1 - Economic Evaluation of Coal Properties

1. Explanation of Material Transmitted: This release provides specific requirements for economic evaluation (appraisal) of coal properties and for use of such appraisal in the lease sale or exchange process.

2. Reports Required: None.

3. Material Superseded: None.

4. Filing Instructions: File as directed below.

REMOVE: INSERT:

None H-3070-1

(Total: 106 Sheets)

Assistant Director, Energy and

Mineral Resources

[Table of Contents](#)

Page

I. [INTRODUCTION](#)

A. [Purpose](#)

B. [Fair Market Value](#)

C. [History of Coal Fair Market Value Estimation](#)

D. [Overview of the Guide](#)

1. [Preliminary Analysis, Data Selection, and Data Collection](#)

2. [Selection and Application of an Appraisal Method](#)

3. [Documentation of the Presale Appraisal Process](#)

4. [Post-Appraisal Analysis](#)

II. [DATA REQUIREMENTS](#)

A. [Introduction](#)

B. [Economic Data Requirements](#)

Figure 1. Out of State Appraisal Responsibilities

1. [Regional Economic Data](#)
 2. [Specific Lease Tract Economic Data](#)
 3. [Lease-Specific Comparable Sales Data](#)
 4. [Economic Data Report](#)
5. Figure 2. Outline for the Economic Data Report
- C. [Geologic and Mine Engineering Data Requirements](#)

1. [Property Status Data](#)
2. [Site Minability Data](#)
3. [Cost Data](#)
4. [Geological and Engineering Data Report](#)

Figure 3. Outline of Geologic and Engineering Data Report

Figure 3. Outline of Geologic and Engineering Data Report

D [Data Sources](#)

Figure 4. Potential Sources of Appraisal Information

III. [METHODS AND MODELS USED FOR APPRAISAL](#)

A [Introduction](#)

B [Comparable Sales Approach](#)

1. [Overview of the Comparable Sales Approach](#)
2. [Eligible and Selectable Comparable Sale Transactions](#)
3. [Comparable Sales Estimating Method](#)

[Matrix 1 Tracts](#)

[Matrix 2 Tracts](#)

4. [Reconciliation of Indicated Values](#)

Figure 5. Regression Analysis Estimate of FMV of a Federal Coal Lease Property

C. [Income Approach](#)

1. [Overview of the Income Approach](#)

Figure 6. Overview of Income Approach

2. [Mine Plan Selection](#)
3. [Determining Revenues](#)
4. [Determining Mining Costs](#)
5. [Discount Rates](#)
6. [Discounted Cash Flow Analysis and Taxes](#)
7. [Incorporating Uncertainty in the Valuation Process](#)

Figure 7. DCF Summary

Figure 8. Weighted Scenario Analysis

8. [Computer Models for Mineral Property Valuation](#)

Figure 9. Discounted Cash Flow

Figure 10. Overview of Engineering Process Model for Coal Mining Costs

- D. [Application of Appraisal Methods to Federal Coal Lease Tracts](#)

1. [Valuation of Type 1 Tracts](#)

2. [Valuation of Type 2 Tracts](#)

Figure 11. Type 1 Tract

Figure 11. Type 1 Tract

Figure 12. Type 2 Tract

Figure 12. Type 2 Tract

3. [Valuation of Type 3 Tracts](#)

Figure 13. Alternative Valuation Type 2 Tract

Figure 14. Type 3 Tract

Figure 14. Type 3 Tract

Figure 14. Type 3 Tract

4. [Special Considerations](#)

IV [PREPARATION OF PRESALE APPRAISAL REPORT](#)

- A. [Format](#)

- B. [Appraisal Report Structure](#)

1. [Summary Page](#)
2. [Table of Contents](#)
3. [Introduction](#)
4. [Appraisal Tract Description](#)
5. [Analysis](#)
6. [Exhibits or Addenda](#)
- C. [Signature](#)
- D. [Confidentiality of Data](#)

V [REVIEW AND POST-APPRAISAL PROCESS](#)

- A. [Introduction](#)
- B. [Review of Presale Appraisal Report](#)
 1. [Review of Appraisal Procedures](#)
 2. [Review of Supporting Documentation](#)
 3. [Documenting the Presale Appraisal Report Review](#)
- C. [Post-Sale Analysis of Bids](#)
 1. [Bid Acceptance Process](#)
 2. [Post-Sale Appraisal Report](#)
- D. [Review of Post-Sale Analysis](#)
- E. [Confidentiality of Data](#)

VI. [ECONOMIC EVALUATION FOR EXCHANGE](#)

[Glossary of Terms](#)

[Bibliography](#)

[Appendix](#)

1. [List of Acronyms](#)

LIST OF ACRONYMS

AEOT Average Evaluation of Tract

BLM Bureau of Land Management
DCF Discounted Cash Flow
DOI Department of Interior
EA Environmental Assessment
EIS Environmental Impact Statement
EMARS Energy Minerals Activity Recommendation System
EPRI Electric Power Research Institute
FCLAA Federal Coal Leasing Amendments Act
FLPMA Federal Land Policy Management Act
FMV Fair Market Value
MLA Mineral Leasing Act
MU Mining Unit
NPV Net Present Value
OMB Office of Management and Budget
RET Regional Evaluation Team
SID Secretarial Issue Document
USGS United States Geologic Survey

I. INTRODUCTION

A. PURPOSE

In July 1983, Congress established the Commission on Fair Market Value Policy for Federal Coal Leasing (the Commission) to study the Federal coal management program and resolve Issues concerning the Department of the Interior's leasing procedures. The Commission was directed

to examine statutes, policies, and procedures to ensure receipt of fair market value from Federal coal leases,

to evaluate efforts to Improve fair market value policies and procedures for the coal leasing program, and

to recommend Improvements In the statutes, policies, and procedures .

In February 1984, the Commission transmitted its findings and recommendations to the Department of the Interior and the Congress. The Commission recommendations concerning appraisal procedures focused on factors and information that should be considered or obtained by the Government as part of the appraisal process. The

Commission recognized that uncertainty is inherent in the appraisal process and recommended that the Department develop methods and procedures that are "unassailable not only in fact but also in public perception." The Commission also found that a lack of formal guidance precluded external review of appraisal procedures and suggested the development of guidelines to promote uniformity among field office appraisals and to open the procedures to public inspection.

The purpose of this Handbook is to present guidelines for Federal coal property appraisal in terms useful to the administrator who is responsible for appraisals and to the field personnel who perform them. In this guide, the term Federal coal property refers to a Federal coal property, right, or interest to be disposed of through leases, exchanges, or other methods.

An appraisal is a valuation. In the context of this guide, the principal concern is the valuation of a Federal coal property offered for lease, exchange, conveyance, lease modification, or coal right transfer. The guidelines are presented to promote a uniform approach to Federal coal property appraisal. The intent is to encourage consistent and replicable application of standard appraisal procedures.

The value estimated for Federal coal lease sales is used to ensure receipt of at least the fair market value (FMV) as required by the Federal Coal Leasing Amendments Act of 1976 (FCLAA). It is used to determine the adequacy of bids received at a lease sale. The value for other transactions is used in accordance with the authorizing legislation. As such, the appraisal process embraces a range of evaluation procedures which, when applied to available data, leads to an estimation of the property's value. In application, the data from which the appraisal is drawn often are limited, leading to an estimate that inherently is uncertain; consequently, estimates of fair market value, compensation, equal value, or other value may vary among appraisers.

The Handbook discusses two commonly accepted procedures for value estimation: the comparable sales approach and the income approach. The comparable sales approach is an appraisal procedure in which the prices paid in prior transactions of similar coal properties are used to value the Federal coal property to be disposed of through leasing, exchange, or other means. This procedure generally is preferred to other appraisal procedures since it is thought that prices paid in prior transactions of similar coal properties provide the best indication of value. The income approach involves the estimation of annual costs and revenues associated with the development of the coal property under realistic conditions. Annual cost and revenue streams are reduced to a single number in which future costs and revenues are discounted to the present. The property's net income potential, discounted to the present, provides an estimate of current sale value.

The two approaches to value estimation form the basis for developing from available data an estimate of the fair market value of a Federal coal property. The Regional Evaluation Team (RET) is usually responsible for preparing the fair market value estimate. The purpose of this Handbook is to assist the RET through the appraisal process by providing a complete and systematic approach to Federal coal property valuation. If an alternative approach not discussed in the guide is selected by the RET, sufficient rationale for using the approach must be provided.

B. FAIR MARKET VALUE

An appraisal is concerned with an estimation of the fair market value of a property or equal value in exchange. Under the FCLAA, the Secretary of the Interior shall not accept a bid that is less than the fair market value of the coal subject to the lease. Also, specific legislation regarding coal lease and fee exchanges, as well as the Federal Land Policy Management Act of 1976 (FLPMA), requires equal value determinations. Although the term "fair market value" has no statutory definition, an accepted meaning has evolved through judicial interpretation.

The traditional definition of "fair market value", as stated in Uniform Appraisal Standards for Federal Land Acquisitions, 1992 is as follows:

"Fair market value" is defined as the amount in cash, or on terms reasonably equivalent to cash, for which in all probability the property would be sold by a knowledgeable owner willing but not obligated to sell to a knowledgeable purchaser who desired but is not obligated to buy. In ascertaining that figure, consideration should

be given to all matters that might be brought forward and reasonably be given substantial weight in bargaining by persons of ordinary prudence, but no consideration whatever should be given to matters not affecting market value.

The Appraisal of Real Estate, 1992, by the predominant appraisal organization the Appraisal Institute, provides a second similar definition of market value, as follows:

[Market value is] the most probable price in cash, terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress.

The salient features of fair market value are as follows:

1. Fair market value is characterized as, or is representative of, a transaction between a knowledgeable buyer and a knowledgeable seller.
2. Neither buyer nor seller is obligated or under duress to buy or sell.
3. Fair market value is determined by reference to a competitive market rather than to the personal or inherent value of the property.
4. The property is exposed to a competitive market for a reasonable time.
5. Market value is only that value transferable from owner to owner. In most cases this means private market value.
6. Properties lacking buyer competition, which are likely to become part of a larger competition property, can be given an estimated market value as part of the larger property.

In accordance with the market concept, the price paid for a similar property in an arm's-length transaction is accepted as the best evidence of fair market value. However, in the absence of a market, judicial interpretation of the fair market standard permits the valuation of the property in a hypothetical market. Factors to be considered in estimating value include probable demand, property location, and property use.

C. HISTORY OF COAL FAIR MARKET VALUE ESTIMATION

The need for value estimations of Federal coal properties evolved from the Mineral Leasing Act of 1920, which changed procedures for the acquisition of coal mineral rights from outright sales to leases. Early efforts to ensure reasonable value for coal property looked to the Federal Property and Administrative Services Act of 1949, whereby coal in lands reported as surplus was disposed of by the General Services Administration. In 1959, the Bureau of the Budget [now the Office of Management and Budget (OMB)] stated that fair market value should be obtained where federally owned resources are leased or sold.

Prior to 1970, the Department of the Interior paid little attention to setting a value for coal leases. Competitive and noncompetitive leases were available at little cost, because it was thought that the Federal Government would receive a fair return through royalty collection. In 1971, the Conservation Division of the U.S. Geological Survey (USGS) adopted the "K-Factor" formula of evaluation. This was an empirical formula that considered the total thickness of minable beds, the Btu value, the coking quality, and the depth. The formula included a variable, K, that was determined by the Area Mining Supervisor based on his judgment of market conditions and other factors. The K-Factor formula forced the Area Mining Supervisor to specifically consider important geological parameters. However, the formula was used for valuing few leases because in 1971 the Department issued an informal coal leasing moratorium to prevent speculation. This action was followed in 1973 by a formal moratorium on leasing, except for short-term leases meeting specific criteria, while the Department developed a new long-term leasing policy. In 1975, a programmatic environmental impact statement was released on the proposed Energy Minerals

Activity Recommendation System (EMRS) program. One of the goals of the new policy was the return of FMV for Federal coal lease tracts.

Development of new coal evaluation procedures by the Department began in late 1975 in response to criticism directed at existing evaluation procedures. The new method was based on the income approach utilizing discounted cash flow (DCF) procedures. The development efforts were carried out by the Conservation Division and included development of documented operational procedures and a computerized DCF program. Computer-generated DCF values were used as the Department's estimate of FMV.

Economic evaluation was structured as a three-level function: (1) resource determination by the area geologist, (2) mining method and mine design by the area mining supervisor, and (3) costing and economic evaluation (including tract valuation) by the economic evaluation staff. The tract results were assessed by a three-member committee that made a recommendation to the BLM State Director to be used in determining FMV.

Beginning in 1977, the Department decided to provide an indication of its estimation of value when offering leases. This took several forms between 1977 and 1980, including advertising leases at minimum bonus bids with royalty rate bidding; advertising leases at minimum statutory royalty rates and variable bonus bids; and offering the bidders a choice between the two. These published values, in effect, were the Department's presale estimate of value, and any bid at or above these amounts was accepted as FMV. During this time, concern was expressed over the meaning of FMV in light of legal requirements and Federal goals and responsibilities concerning coal leasing and development. In 1979, a Federal coal leasing FMV task force was convened to develop options for FMV and minimum acceptable bid policy and criteria. A Secretarial Issue Document (SID) was prepared, which dealt with the definition of FMV, the definition of minimum acceptable bid determination for different tract types, and other policies for Federal coal tract evaluation. The SID required that "fair market value for Federal coal leases should steer a course midway between seeking to maximize capture of economic rent and satisfying the minimum legal obligations." The SID also required that large and small tracts be evaluated differently and that FMV should be captured through the use of higher than regulatory minimum bids where appropriate, rather than elevating the royalty rates.

To implement the SID, an Oversight Group was established to set procedures for differentiating large and small tracts. Preliminary mineral appraisal and small tract determination procedures were sent to the field personnel for implementation.

In 1980, a formal decision on small, high-rent tracts was issued. These tracts were divided into two types, and different procedures for evaluating minimum acceptable bids for each were recommended. These procedures were in effect from December 1980 to September 1982, with publication of interim procedures that strengthened the Department's ability to obtain FMV. Also in 1980, preference shifted to the use of the comparable sales approach for FMV estimation as more sales data from Federal coal leasing became available.

As part of a Department effort to streamline procedures, the Conservation Division of the USGS recommended the consideration of competition as an acceptance factor when determining FMV. In early 1982, the Department developed procedures to allow the competitive market to have an input into determining FMV.

For the Powder River region lease sale in 1982, it was decided to make the final tract value estimations after all bids had been examined. Presale estimates of values were based on adjusted comparable sales. Monetary adjustments representing the cost and revenue impacts of physical differences between the subject tracts and the comparable tracts were made using a computer program. In order not to preclude legitimate potential bidders from bidding, a decision was made not to release the presale estimates of tract values to the public. Instead, the tracts were grouped into four categories with a different entry level or floor bid for each category. Published entry level bids were based on cents per ton of recoverable coal, except for one category of \$25 per acre (the regulatory minimum). Post-sale evaluation guidelines were adopted to consider the presale values, the competition at the sale, and discretionary special tract circumstances that were allowed to affect bid acceptance or rejection decisions.

Following the Powder River regional coal lease sale, a number of actions were taken by the Department to improve

the coal lease evaluation procedures. In the summer of 1982, revised Federal coal management regulations were adopted that prescribed leasing by sealed bidding and a \$100-per-acre minimum bid.

In September 1982, the Department adopted interim lease sale procedures that called for structurally competitive tracts to be offered at a minimum bid of \$100 per acre and structurally uncompetitive tracts to be offered at a minimum bid that would constitute a representative market value, but in no event be less than \$100 per acre. Fair market value was to be determined after the sale using competition where it occurred and updated presale comparative analysis where competition did not occur. The interim procedures removed any special circumstances from the recommendation to the sale panel and relegated them to comments on the recommendation.

New procedures were adopted in July 1983 and implemented on the Fort Union coal sale, as follows: First, a dated and sealed presale evaluation was prepared. Second, no hints were given bidders as to the presale value estimates; all leases were offered at a minimum bid of \$100 per acre. Third, tight security was instituted concerning the Department's reservation prices and the number and identity of bidders until the bids were opened publicly. Fourth, a post-sale bid evaluation occurred in which acceptance of bids, if any, were based on the average of two or more substantive bids (of at least 25 percent of the presale estimate) and the presale estimate. Tracts accepted under this process became available as comparable tracts to be used, as appropriate, to estimate the value of tracts that did not receive two or more substantive bids. A complete sale panel decision document was required, and all reservation prices on tracts not sold remained confidential.

In 1985 the guidance upon which this Handbook is based was sent to the field offices in the form of A Guide to Federal Coal Property Appraisal. The guidance has been successfully used by the RETs since that time. In 1993 comments were received from the field offices on the guidance in preparation for issuing a Handbook. A few minor modifications were made in response to comments and this Handbook resulted.

D. OVERVIEW OF THE GUIDE

The goal of the appraisal process is to provide a well-supported estimate of property value that reflects all factors that influence the value of the appraised property. To achieve this goal, the RET assembles data, evaluates the data, and selects the appraisal procedure that is most appropriate for the data. This process may be organized into distinct activities that lead to a formal documentation of the presale appraisal process and potential reevaluation of the appraisal based on information obtained from the lease sale. These activities include preliminary analysis, data selection, and data collection; selection and application of an appraisal method; formal documentation of the presale appraisal procedure; and post-appraisal analysis.

1. Preliminary Analysis, Data Selection, and Data Collection

An appraisal begins with the collection and evaluation of data from which the estimate of FMV will be drawn. The RET is concerned with the type, quantity, and quality of data available because these characteristics determine the valuation approach employed and provide a basis for establishing confidence in the value obtained through the appraisal process. Chapter II discusses general and specific data requirements, presents potential data sources, and provides information concerning the formal documentation of the data used in the appraisal process.

2. Selection and Application of an Appraisal Method

Two appraisal methods are discussed in this Handbook: the comparable sales approach and the income approach. The selection of an appraisal method depends upon the type of data available to the RET. When reliable comparable sales data are available, it generally is assumed that the comparable sales approach will provide the best indication of value. However, these data must meet eligibility and selectability standards; otherwise, the income approach should be used. Chapter III discusses each approach in detail, presents the criteria for selecting and applying each approach, and provides examples to demonstrate the application of each approach to Federal coal property valuation. The procedures for evaluating and selecting an appropriate appraisal method are presented, as well as a delineation of the specific steps required to implement each method. Also discussed are procedures for incorporating uncertainty in the analysis and modeling and costing algorithms to assist the RET in

the valuation process.

3. Documentation of the Presale Appraisal Process

The valuation process is formally documented in a written report. The report presents a summary of the data used in the valuation, the rationale for selecting a specific appraisal approach, and the method used to obtain the estimate of FMV. The organization of the presale appraisal report is presented in Chapter IV.

4. Post-Appraisal Analysis

The post-sale appraisal analysis includes a review of the presale appraisal process for technical accuracy and conformance to appraisal guidelines, a post-sale evaluation of bids, and a recommendation to accept or reject a bid. Chapter V discusses the post-appraisal process. It includes the criteria by which all bids are screened to determine if they qualify for further consideration, the bid acceptance criterion, and the use of information obtained from the lease sale to reappraise tracts that qualified for further consideration but did not meet subsequent conditions for an initial evaluation.

The valuation procedures discussed in this Handbook apply also to land exchanges. A land exchange involves negotiation between the government and the interested party to arrive at a fair exchange. Legislation authorizing land exchanges mandates equal value in exchange. The process for establishing equal value is presented in Chapter VI. A glossary of terms used in the Handbook and a bibliography are presented in the appendixes.

II. DATA REQUIREMENTS

A. INTRODUCTION

The purpose of this chapter is to present data requirements for the valuation of a Federal coal property. The appraisal process begins with a search for general and specific information that forms the data base from which the estimate of FMV is drawn. The general information provides a broad framework for the valuation process. It is used to develop or verify general regional trends in coal demand, coal markets, coal production, and coal prices. Specific information represents the actual working data that provide the value estimate. This information includes data on sales of similar coal properties, potential markets for the leased coal, site-specific geologic and engineering data, and mining cost data. The availability, type, and quality of specific information determine the appraisal method used to value the Federal coal property.

The data requirements fall into two broad categories: economic data and geologic and engineering data. Economic data are developed to evaluate short- to long-term demand for the coal type, to evaluate expected price levels and trends, and to assemble a body of data on prior transactions of similar coal properties. Geologic and engineering data are developed to evaluate coal characteristics, to construct mine plans and determine mine costs, and to compare tract characteristics with characteristics of similar coal properties.

The purpose of developing a data base is to provide a solid foundation for the estimation of value. In cooperation with the State office, the RET will develop information to support a regional marketing study; the RET also will develop site-specific information. The RET will receive geologic and engineering information prepared by the District and Area office geologist and mining engineer and develop it. The data are to be reviewed and developed by the RET to ensure that there is sufficient information to support the valuation of the specific Federal coal property. Because the geologic and engineering information form the basis for property valuation, questions or clarification concerning the data are to be resolved by the appropriate Deputy State Directors. An overview of out of state appraisal responsibilities is shown in Figure 1.

The RET will organize the data it collects and receives into an economic data report and a geologic and engineering data report to document the data, data sources, and assumptions used to develop the data. These

reports will contain a statement certifying the accuracy and adequacy of the data.

The discussion that follows presents the types of data the RET will find useful to provide a proper basis for preparing an appraisal. Much of these data play an essential role in the appraisal process; other data will be supplemental. Some data will be easy to collect or develop; other data will be difficult to obtain. It is not necessary to acquire all the data elements described below to proceed with the appraisal process. It is necessary, however, that a sufficient body of data be developed to support adequately the estimation of value and to provide the rationale for the use of the data. Without sufficient data and rationale for the use of the data, the appraisal process cannot proceed. The RET may use informed judgement to infer data from limited information; however, the rationale for developing the data must be stated. Since appraisals should be made with the recognition that the estimation of value may be contested, the RET must ensure that the valuation is based on reliable data and that inputs and assumptions used in the appraisal process are sufficiently documented with the clear rationale used to derive the input. The RET also must ensure the confidentiality of sensitive and proprietary information.

B. ECONOMIC DATA REQUIREMENTS

The economic data requirements fall into the following three categories:

1. General regional economic data
2. Specific lease tract economic data
3. Lease-specific comparable sales data

General regional economic data provide information from which trends in regional coal activity are drawn. Specific lease tract economic data provide information concerning coal prices, market expectations, and other information specific to the lease tract being valued. Lease-specific comparable sales data provide information concerning prior sales of similar coal properties.

1. Regional Economic Data

Regional economic data are based on the regional market study prepared by the lease State office, the RET, and support contractors. The regional market study establishes the foundation for assessing the short-, intermediate-, and long-term outlook for in situ and produced regional coal demand. It includes information concerning short- and long-term produced coal demand and prices; short- and long-term regional mining costs; prices of coal property leases; regional supply/demand relationships; and regional mine production, including capacity and production expectation.

The information contained in the market study may be supplemented with the following data, if available:

- a. Planned near-and mid-term additions to the coal-fired capacity of regional utilities.
- b. Planned expansions and conversions of large industrial coal users.
- c. Export potential of the coal type of the Federal coal property being appraised.
- d. Regional market information concerning transportation costs and past and new coal contract prices by coal quality, mining method, and end user.

The purpose of obtaining these data is to develop quantitative and qualitative criteria for evaluating expected regional coal production activity. The market study and the supplementary data provide important information regarding the short- and long-term outlook of the regional coal market. This information establishes a basis for assessing potential interest in the lease property. Moreover, regional data on coal prices will assist in developing future price expectations of the coal type of the lease property. Coal price trends may be estimated from past data

or from expected regional marginal mine cost and demand, if sufficient data are available.

2. Specific Lease Tract Economic Data

The RET will obtain economic data specific to the lease tract to be appraised. The data to be collected are as follows:

- a. Potential markets for the lease tract coal.
- b. Potential competition.
- c. Expected market and timing of the sale of the coal and expected coal sale price.
- d. Likelihood (given timing) of lease tract development and production.
- e. Quality produced coal price information.
- f. Marketing characteristics of an associated mine, if any, with which the lease tract may be developed, including contract prices.

Empirical sources of coal price-quality relationships for coal characteristics (e.g., Btu content, sulfur, ash) should be developed so that quality adjustments can be made to expected coal prices. Several Federal, State, and private sources provide f.o.b. mine price and c.i.f. delivered price data. New contract and spot price data should be obtained, if available.

The RET should try to obtain data from neighboring mines. These data should include alternative markets, transportation and costs, coal type and quality, contracted coal prices, mining method, and any other information that may be relevant to the valuation process. It is essential that the RET discuss likely contract prices and production costs with neighboring mine owners who may have use for the lease tract. Information from neighboring mine owners may provide realistic estimates of lease tract-specific economic data.

3. Lease-Specific Comparable Sales Data

Information concerning prior public and private coal property market transactions should be obtained, if available. Transactions should be characterized by location, coal type and quality, geologic conditions, geographic conditions, mining conditions and costs, proximity to transportation, likely development date, probability of development, and other property characteristics that can be used to assess comparability to the lease tract. The terms of the transaction, such as royalty rate and payment terms, must be fully determined, especially if the transaction is a private sale, so that the comparable sale may be correctly used in the appraisal.

4. Economic Data Report

The economic data report represents formal documentation of the data provided by the lease State office/RET market study and any additional information obtained by the RET. The report will contain at least the minimum economic data required to support the valuation process. Raw data need not be included; however, these data should be referenced in the report to maintain an auditable link to the data. Sensitive and proprietary information can be included in the report, but the confidentiality of this information must be maintained. The report must be stamped "sensitive or proprietary" if it contains confidential data. A summary of the report will be contained in the appraisal report discussed in Chapter IV.

An outline of the economic data report is shown in Figure 2. The report contains three sections that correspond to the following distinct categories of economic data: regional economic data, lease tract economic data, and lease-specific comparable sales data.

The general regional economic overview section will contain an overview of the regional market activity. Data and data sources used to assess the short-, intermediate-, and long-term outlook for the regional coal reserves will be documented; the market study prepared jointly by the Lease State office and the RET will be summarized; and the additional information provided by other offices and collected by the RET will be presented. The section will include an assessment of regional demand and potential markets, regional lease sale price and production trends, regional coal price trends and coal price-quality data, and an evaluation of regional capacities.

The specific lease tract economic data section will contain property specific economic data used either to evaluate comparable sales data or to estimate the revenue potential of the property. Data and data sources used to develop the data base of lease-related information will be documented. The section will include a discussion of the potential markets for the lease coal and an evaluation of the timing and likelihood of the lease coal markets. Also included will be an estimate of likely lease coal sale prices and a compilation of the coal price-quality data that will provide the analytical and empirical foundation for coal price-quality adjustments. The section will contain information concerning transportation access and costs, contracted coal prices, and other data obtained from neighboring mine owners or other sources. Additionally, information on capacities, costs, and markets for competing mines should be discussed.

The lease-specific comparable sales data section documents the data and data sources used to develop candidate properties for comparable sales analysis. The information contained in this section includes:

- a. A description of the transaction, including the parties involved, the transaction date, and the transaction terms.
- b. A legal description of the property, including tract name, township, range, and meridian.
- c. A property description, including transportation networks.
- d. A qualitative and quantitative description of factors affecting the transaction sale price, including marketing outlook at the time of the transaction, coal type and quality, and existing or potential mine status.

For completeness, each comparable sale property's geologic and mine engineering data (discussed in Section C) is included in this section.

C. GEOLOGIC AND MINE ENGINEERING DATA REQUIREMENTS

Geologic and mine engineering data include legal and property status characteristics; geologic, geographic, and geosstructural characteristics; and capital and operating cost data associated with property development. The purpose of collecting geologic and mine engineering data is twofold: to provide the mine development, cost, and production basis for determining the revenue potential of property development; and to provide the essential technical information to compare characteristics of a property being appraised with characteristics of similar properties for which there are prior transactions. The extent to which these data are collected depends upon the availability of data; the RET's and District and Area geologist's and mining engineer's collection of available data; and the ability to provide adequate rationale for assumptions inferred from limited data.

1. Property Status Data

A legal description of the property should be developed in the State Office. The description should include boundary information and other pertinent title and record data obtained from public offices, deed depositories, or other sources of public records. Property status must be delineated prior to valuation since it affects either the estimation procedure or the applicability of prior transactions of comparable properties to the appraisal process. For the purpose of Federal coal property valuation, each property may be classified as one of the following tract types: a single tract that constitutes a mining unit (MU) for a new mine operation, a single tract that constitutes a portion of an MU for a new mine operation, or a single tract that constitutes an increment to an existing mine operation. These classifications are discussed further in Section III-D.

2. Site Minability Data

Geologic and mine engineering data should be developed by the District office and the RET for the property being appraised and for properties for which prior sale transaction information is available. The purpose of these data is to provide the RET with sufficient information to either specify a mine plan for the property or to compare salient property characteristics between the property being appraised and prior public or private coal sale transactions. Geologic and engineering property information that should be developed, if available, are:

- a. Geologic properties of the tract, including coal type, coal quality and physical properties of coal, interburden, and overburden, as well as conditions that affect the minability (e.g., special water problems or rock mechanics).
- b. Geometric characteristics of the tract, including areal extent, continuity, thickness, structure and depth of the deposit.
- c. Geographic characteristics of the tract, including location, topography, and surface conditions.

3. Cost Data

Cost data are used to evaluate the revenue potential of the property or to develop an adjustment to comparable sale transactions to account for differences in property attributes. The required cost data include capital cost elements, operating cost elements, and auxiliary cost elements that characterize the economic characteristics of mine development. The cost data to be collected are defined by the mine plan developed for the property to be appraised and, when applicable, for the comparable property. The specific cost elements required by the appraisal process are discussed in detail in Section III.C.4 and are summarized as follows:

- a. Capital cost elements, which include costs associated with preproduction activity, mine development, and production.
- b. Operating cost elements, which include costs associated with labor, material, maintenance, and utilities.
- c. Auxiliary cost elements, which include contingency, indirect, and fixed costs.

4. Geological and Engineering Data Report

The geological engineering data report consists of three sections corresponding to the following categories of technical data: geologic and geographic data, engineering mine plan, and mine engineering data and costs. An outline of the geologic and engineering data report is presented in Figure 3.

The geologic and geographic section presents data for the coal property being appraised and for prior transaction properties. Geologic and geographic conditions at each property affect engineering considerations that influence mine development. In some cases, drilling and geologic survey data will be available. The source of the data must be documented, and maps and descriptions of geologic sections should be included if available. If these data are unavailable, the method for estimating geologic information must be presented and substantiated. The geologic continuity between the mine and lease should be discussed.

The mine plan section presents several possible alternative mine plans for all properties (i.e., comparable properties and property to be appraised). The mine plans must be site-specific to account for all the geotechnical and economic considerations relevant to the property since geologic, geostructural, and geographic conditions at each site, as well as economic factors, influence mine development. Generic mine plans should be avoided. The RET should obtain the software needed to calculate alternative mining sequences and mine plans. Consideration should be given to mine development that may reasonably be applied to the conditions at the site.

The mine engineering section documents the data from which minability considerations are drawn. The purpose of this section is to present the engineering data specific to property development. The data are used to develop the

property mine plan used in subsequent analysis. Also included in this section are the region-specific cost data used to develop capital, operating, and other cost elements for property valuation. These data include regional salary structure, equipment prices, local tax structure, and other individual cost items that comprise the cost data base for the appraisal process. Differences between mine and lease should be explained.

D. DATA SOURCES

Figure 4 lists potential sources of data useful to the appraisal process. An annotated listing of data sources is included in the Bibliography.

Figure 3

OUTLINE OF GEOLOGIC AND ENGINEERING DATA REPORT

I. GEOLOGIC AND GEOGRAPHIC SECTION

A. Legal description of the area

1. Legal location

2. Map showing general affected area. to include roads, ditches, canals, culverts, and topography if these preclude mining

B. Geologic characteristics

1. Overburden volume, average thickness, and physical properties

2. Interburden volumes and characteristics, average thickness, and physical properties

3. Lateral cutoffs

4. Depositional environment and local structure

C. Coal quality per bed (approximate analysis)

1. Btu/pound

2. Percent sulfur

3. Percent ash

4. Percent moisture

5. The laboratory that conducted the analysis and the date of the analysis

6. Trace elements if available

7. Coal density

D. Coal quantity by bed

1. Average thickness

2. Assumptions used in making cutoffs etc.

E. Additional Data

1. Hydrologic data and problems

2. Geologic data and problems

a. Isopachs - overburden, interburden, coal

b. Structure

c. Stripping ratio

d. Areas unsuitable for mining

e. Mineral development conflicts

3. Recommendation of the District on company data that was requested for existing mines exchanges and PRLAs.

4. Verification provided by the District that the coal requested by the company does not exceed the regulatory allowance when leasing by application (i.e.. emergency),

5. Information provided by the District on the mining sequence of the lease modification in reference to the mine then a lease modification is considered.

6. Special stipulations

II. MINE PLAN SECTION

A. Mine plan scenario

1. Presentation of possible mine plans by the District and the RET.

2. Company data provided for exchanges, PRLAs, lease modifications. and emergency lease applications. Evaluation and recommendations of the District also should be included.

III. MINE ENGINEERING SECTION

A. Type of mine

B. Equipment list

C. Manpower requirements

D. Financial data (to be kept proprietary)

1. Equipment costs

2. Manpower costs

3. Other financial data

E. Transportation information

1. Type of transportation

2. Railroad spur - loop existence at or near site

3. Access issues and problems

F. Facility sites and improvements

Figure 4

POTENTIAL SOURCES OF APPRAISAL INFORMATION

DATA SOURCES DATA TYPE

Department of the Interior

Mineral Management Service Royalty management data

Geological Survey Coal resource data

Office of Surface Mining Mine-specific information

Bureau of Mines Mine technology data

Department of Energy Current and historical data

on reserves, production, and

consumption. Economic fore-

casts, electric power industry

data. Mine costing data.

Department of Commerce Coal export data

Department of Labor Regional labor statistics,

equipment price indexes

Department of Transportation Coal transportation data

Interstate Commerce Commission Coal transportation data

State and Local Governments Prior sales transactions,

regional information

Coal Property Buyer/Sellers Comparable sales data

National Laboratories Forecasts and other coal-

related data

Private Organizations and Economic and cost data

Services

Private Producers and Coal prices, markets, capacities

Consumers

Mine Owners Cost, markets, capacities, mine

plans, and contract prices of

nearby mines

III. METHODS AND MODELS USED FOR APPRAISAL

A. INTRODUCTION

An appraisal is an unbiased estimate of the value of property. The appraisal process is a systematic approach to property valuation. It consists of defining data requirements, assembling the best available data, and applying an appropriate appraisal method. The principles of property valuation are presented in the Uniform Appraisal Standards for Federal Land Acquisitions 1992 and in The Appraisal of Real Estate (1992). These principles provide guidance to formulating procedures for estimating the value of a Federal coal property. The valuation of a Federal coal property is particularly complex because traditional indicators of market activity often are unavailable. Most Federal coal properties are first-time offerings to potential buyers; consequently, market information that normally results from prior sales of property may not exist. In its absence, the valuation procedure must extract from other available data a defensible estimate of coal property value.

Two appraisal methods are discussed - the comparable sales approach and the income approach. In the comparable sales approach, the value of a property is estimated from prior sales of comparable properties. The basis for estimation is that the market would impute value to the subject property in the same manner that it determines value of comparable competitive properties. In the income approach, the value assigned to the property is derived from the present worth of future net income benefits. When sufficient similar sales data are available, the comparable sales approach is preferred to other appraisal methods. If sufficiently similar sales are not available the prior sales can sometimes still be used to bracket the income approach value.

B. COMPARABLE SALES APPROACH

The comparable sales approach is a method of estimating Federal coal property value that relates the value of the property being appraised to the value of comparable properties already sold. The basis of the comparable sales approach relies on the following characteristics:

Prices are determined in a competitive market.

Prices result from the negotiation between knowledgeable buyers and sellers.

Neither buyer nor seller is under undue pressure to buy or sell.

Variations in property attributes between the property being appraised and the comparable properties can be accounted for if necessary through a monetary adjustment to each comparable property's value.

The approach may be applied when it is determined that a previous sale is comparable. Previous sales do not have to be identical in order to be comparable as long as there is a technically-based judgement of reasonable similarity, or a technically-based adjustment can be made to account for differences. For example, if a lease being appraised has coal of higher energy content (Btu) than a comparable sale, the price paid for the comparable sale would be adjusted upwards.

1. Overview of the Comparable Sales Approach

The general procedure for applying the comparable sales approach is as follows (Figure I)

- a. Data Collection. Extensively research sources of comparable sales transactions to obtain information about transactions of similar properties. Data requirements for comparable sales are discussed in Chapter II.
- b. Eligibility. Verify the accuracy and completeness of information and evidence of a transaction between knowledgeable participants not obligated to buy or sell.
- c. Selectability. Review the property attributes for similarity to the property being appraised to determine if the data can be used without adjustment or if an adjustment is required. If an adjustment is required, determine whether sufficient information is available to adjust for differences in property attributes.
- d. Estimation of Value. Estimate value of offered property using either unadjusted or adjusted comparable sale transactions or statistical regression of comparable sale data.
- e. Reconciliation. Reconcile multiple estimates of value into a single indication of value.
- f. Documentation. Document the process and rationale used to estimate FMV.

2. Eligible and Selectable Comparable Sale Transactions

The Uniform Appraisal Standards for Federal Land Acquisitions provides criteria to be considered when evaluating a prior transaction as a comparable. The criteria are as follows:

Time interval between sale date and appraisal date.

Motivation of sales transaction.

Similarity in locational aspects.

Similarity in use and intensity of use.

Physical and economic similarities.

The first step in the comparable sales approach is to determine whether a prior transaction is truly comparable. The test for comparability is a two-tiered approach. First, the RET determines if the transaction is eligible. Eligible transactions then are tested for selectability. Candidate comparable sale transactions are screened for conformance to eligibility and selectability criteria. Transactions that meet the criteria can be used as comparable. The RET should be prepared to defend the selection of comparable sale transactions. Eligibility and selectability criteria are described below.

a. Eligible Transactions

The following criteria are used to determine eligible tracts:

1. Transaction Identification. The transaction identification should be based on an extensive search. Evidence of the search should be documented. This evidence should include details on where property records were obtained or examined and how supporting information was obtained. Potential sources of information include Federal coal lease sales, state and local offices, Indian tribes, and private sales.

2. Transaction Terms and Price. The terms and price of the transaction must be verified and documented.

3. Not-Obligated Buyer and Seller. The transaction should be examined to ensure that there is no indication of undue stimulus to buy or sell. If possible, both the buyer and the seller should be contacted to verify motivation and nature of the transaction.

4. Knowledgeable Buyer and Seller. Evidence should be presented demonstrating that the transaction involved a knowledgeable buyer and a knowledgeable seller and that the transaction was intended to result in the most financially favorable market price for each.

b. Selectable Transactions

A selectable transaction is an eligible transaction that can be used without adjustment, or it is an eligible transaction to which an adjustment to the sale price can be made to account for differences in property attributes. Property attributes to be compared are as follows:

1. Time of Sale and Market Conditions. Recent transactions are preferred since market conditions may have changed between the transaction date and the appraisal date.

2. Terms of Sale. Value is normally stated in terms of cash, or its equivalent, payable at the time of sale. The terms of sale of the property being appraised can differ from the terms of the eligible transaction. The differences should be evaluated.

3. Physical Characteristics. Physical characteristics (e.g., stripping ratio, seam thickness, depth to deposit, continuity) influence property value and marketability, and differences must be evaluated.

4. Coal Characteristics. Differences in Btu content, sulfur content, ash, and other coal quality characteristics affect coal tract value and marketability and must be evaluated.

5. Production Scheduling. Coal value is affected by the timing and rate of production, and differences should be evaluated.

6. Access to Property and Transportation. Access to the property and proximity to transportation and markets should be evaluated.

7. Type of Market. Consideration must be given to the type of market for the coal. Differences in the market for the coals must be evaluated.

8. Likelihood of Development. Timing and likelihood of coal development must be evaluated since they affect the value of the coal lease.

9. Other Factors. Other factors that may cause value differences between the tracts should be evaluated.

c. Special Considerations

Certain transactions are not normally considered acceptable evidence of value. Some transactions must not be used in appraisals; others may be used if better data are unavailable. If a "questionable" transaction is used, the RET must explain the basis for the price paid and present clear evidence as to why the transaction represents a useful indicator of value. Transactions that cannot be used as comparable sales include sales that do not show evidence of

a buyer and seller not obligated to buy or sell (e.g., condemnation sales or sales where the threat of condemnation entered into negotiations). Sales between interrelated companies should not be used unless it can be shown that the sale represents an arm's-length transaction. Sales by government organizations that may have had objectives other than receipt of market value (e.g., industrial development) should not be used unless it can be ascertained that competition among bidders in these sales was itself sufficient to ensure receipt of FMV.

3. Comparable Sales Estimating Method

The comparable sales approach is preferred to other appraisal methods when similar comparable sales transactions are available. Comparable sale transactions can be used to estimate the value of an offered coal property by any of three alternative approaches: unadjusted transactions, DCF adjusted transactions, and regression analysis. The simplest approach is the use of one or more unadjusted comparable sale transactions to estimate coal property value. An unadjusted transaction can be used when it appears that there is sufficient commonality between comparable and offered property characteristics that the unadjusted comparable value provides a reasonable estimate of offered property value. The second approach is to adjust one or more comparable sale transactions to account for differences in property characteristics. The third approach is to develop a regression equation using comparable sales transaction data that relate offered property value to the property's characteristics. Each approach is discussed below.

a. Unadjusted Transactions

The comparable sales approach involves comparing characteristics of the comparable sale transaction and those of the property to be appraised. If the characteristics of the comparable sale transaction tend to match those of the offered tract, the unadjusted transaction price may be used as an estimate of value. The use of unadjusted comparable sales transactions generally is the most popular appraisal method and often is used when circumstances permit. Its advantage is that it reduces the need to make complicated adjustments to the comparable sale transaction values, thus reducing the time required to complete an appraisal.

The RET should search for comparable properties that have similar physical characteristics to the offered property (e.g., geologic, geographic). These properties then are compared for similarity between other property/transaction characteristics, as discussed in Section III.B.2. Individuals familiar with the regional coal activity may provide an indication of which comparable properties are similar to the offered property.

The offered tract characteristics are next compared with each prior sale tract characteristics. Since there are many characteristics this comparison is often shown in matrix form which provides a good way to overview all the tracts and all the characteristics at once. To show this comparison, a matrix with all the characteristics as rows, and the offered and three prior sales tracts as columns, is presented below. Each characteristic for each prior sale must be discussed and researched by the team and some kind of implied rating and weight assigned. In the second matrix below weights of high, medium, and low and ratings of good, fair and poor correspondence have been assigned to each characteristic in the first matrix.

MATRIX 1

-----TRACTS-----

--CHARACTERISTICS-- OFFERED SALE A SALE B SALE C

CENTS PER TON 1.2 20.0 12.0

DATE OF SALE 90 88 87 83

LEASE MARKET fair fair fair fair

COAL TONS MM 40 100 10 60

STRIPPING RATIO 2/1 2/1 1.5/1 2.5/1
 MINABILITY low unknown low low
 THICKNESS surface surface surface surface
 COAL QUALITY 8600 8300 8800 8400
 ACCESS good good good r/of/way
 SURFACE own other own other
 TRANSPORT available available 10mile rail available
 MARKET DATE 95 2000 93 98
 MARKET RISK 10% 50% 10% 20%
 ROYALTY RATE 12.5% 12.5% 12.5% 12.5%
 TRACT TYPE mine new mine new
 UNCERTAINTIES btu terms SO2 s/r
 PROCESSING low low low low

MATRIX 2

-----TRACTS-----

WEIGHT SALE A SALE B SALE C
 -CHARACTERISTICS- RATING RATING RATING
 CENTS PER TON none --- --- ---
 DATE OF SALE med. good fair poor
 LEASE MARKET high good good good
 COAL TONS low fair fair good
 STRIPPING RATIO high good fair fair
 MINABILITY med. good good good
 THICKNESS high --- --- ---
 COAL QUALITY high poor fair fair
 ACCESS low good good fair
 SURFACE low poor good poor

TRANSPORT med. good fair good

MARKET DATE med. good fair good

MARKET RISK high poor good good

ROYALTY RATE high good good good

TRACT TYPE med. poor fair poor

UNCERTAINTIES high good good good

PROCESSING med. good good good

In order to determine which prior sale(s) might be satisfactory as comparable values we can examine the weight and rating Matrix 2 and the analysis behind it. The table shows for example that Sale A is poor in two high weight areas and Sale C is often not as good as Sale B. Sale B might be selected despite its only fair stripping ratio and coal quality correspondence or it might be weighted averaged with Sale C.

Unadjusted transaction prices can be used when the characteristics between the comparable properties and the offered property are sufficiently similar that an adjustment to the transaction price does not seem worthwhile. Single or multiple unadjusted sale prices of comparable properties whose characteristics bracket the offered property's characteristics may be used to estimate offered property value. The reconciliation of multiple unadjusted prices to a single indication of value is discussed in Section III.B.4.

b. Adjusted Transactions (DCF Method)

An adjusted comparable sales transaction is used if it is necessary to account for differences between the characteristics of the comparable property and the offered property. Various methods for adjusting comparable sale transaction values to estimate offered tract value are available. In this section, the DCF adjustment method, which estimates the financial impact of differences in property characteristics, is discussed. For all intents and purposes, it is the only technically based adjustment method available at this time for Federal coal lease valuation.

Early BLM practice was been to determine individual arithmetic adjustments for each value-influencing characteristic that differs between the offered and comparable properties. The individual adjustments are summed to convert the comparable sale value to an estimate of offered property value. This individual adjustment method is commonly applied in appraisals. An example is shown in Figure 2.

Figure 2

Offered tract has lower stripping ratio and Btu/lb than comparable tract.

Comparable Sale Price 3 cents per ton

+ Value stripping ratio difference +1 cents per ton

+ Value coal Btu/lb difference -3 cents per ton

Offered tract value estimate 1 cents per ton

The individual value differences in Figure 2 are determined by the changes in a DCF model output for a "typical" mine in the region when the stripping ratio and Btu/lb are individually altered by the respective differences between the offered tract and the comparable tract. While this approach is simple to apply, there is some concern with its accuracy because it ignores potential interrelationships between property characteristics and also assumes that both the comparable property and the tract being evaluated are well modeled by a typical regional mine. Still if adjustment is made for the major impact items of stripping ratio (costs) and btu/lb. (prices) by their impact on a typical mine DCF, successful non-controversial appraisals can sometimes be accomplished.

For important appraisals an alternative adjustment procedure that will mitigate these concerns is recommended when practical (see III.D.4.). The alternative procedure is as follows: first, estimate a DCF net present value (NPV) for each tract, using hypothetical most-likely mine plans. Next, apply either of two adjustment methods to estimate a value for the offered tract.

In the first adjustment method, an arithmetic adjustment to the comparable sale transaction price is performed as follows:

Calculate the difference between the NPVs of the offered and comparable tracts.

Add the difference to the comparable sales actual value.

The result is an estimate of the value per ton of the offered tract. The arithmetic adjustment method is illustrated in Figure 3.

Figure 3

Arithmetic Adjustment Method

(a) Calculate the difference between offered tract and comparable tract NPVs.

Offered tract NPV 4.5 cents per ton

- Comparable sale tract NPV - 6.0 cents per ton

Arithmetic adjustment factor - 1.5 cents per ton

(b) Add the difference to the comparable sale price.

Comparable sale actual price 3.0 cents per ton

+ Arithmetic adjustment factor - 1.5 cents per ton

Offered tract value estimate 1.5 cents per ton

In the second approach, a proportional adjustment to the comparable sale transaction price is performed as follows:

Calculate the ratio between the NPV of the offered tract and the NPV of the comparable tract.

Multiply the comparable sale actual value by the ratio.

The result is an estimate of value per ton of the offered tract. The proportional adjustment method is illustrated in Figure 4. The proportional adjustment method is currently used when its adjustment to the comparable is least and the arithmetic adjustment method is used when its adjustment to the comparable value is least. This is done under the assumption the less necessary adjustment the better.

Figure 4

Proportional Adjustment Method

(a) Calculate the ratio between offered tract and comparable tract NPVs.

Offered tract NPV 4.5 cents per ton

divide by

Comparable sale tract NPV 6.0 cents per ton

Proportional adjustment factor 0.75

(b) Multiply the comparable sale price by the ratio.

Comparable sale actual price 3.0 cents per ton

Proportional adjustment factor x 0.75

Offered tract value estimate 2.25 cents per ton

In each adjustment method, the adjustment is determined by modeling each tract as an income producing property. A net present value of annual cash flow is calculated from revenues and costs derived from the model. Stated briefly, the NPV is estimated using a DCF analysis as follows:

Develop a mine plan for the property

Develop annual costs and revenues based on the mine plan and expected coal prices.

Select a discount rate and compute the NPV of the annual net cash flow. The NPV is a measure of tract value.

The procedure for estimating NPV using the DCF method is discussed in detail in Section III.C.

c. Regression Analysis

Regression analysis is a possible alternative comparable sales method for estimating value which is not useful for most coal properties. Application of multiple regression procedures determines an expression of price in terms of independent characteristics that contribute significantly to property value. This application requires sufficient data to develop statistically significant results. The estimation procedure is as follows:

1. Collect data concerning property value (price) from past sales and each attribute contributing to value. Analyze the data to determine if the data base is sufficient to provide statistically significant results.

2. Apply multiple regression procedures to determine a statistical expression of property value in terms of the property attributes.
3. Estimate value by applying the attributes of the Federal coal property being appraised to the regression equation.

Regression analysis is most difficult to implement successfully for coal property evaluation because the data required for implementation are not currently available. However, as more comparable sales data become available, the necessary data base may be developed. Regression analysis is illustrated in Figure 5.

4. Reconciliation of Indicated Values

The final step in the comparable sales approach is the reconciliation of estimated (unadjusted or adjusted) values into a single indication of value of the property being appraised. In determining a single value from a set of estimated values (value indications), the RET may give more weight to specific estimated values if the properties are more representative of the sale tract. For example, more recent transactions may be preferred to older transactions, or a particular transaction may differ in only one attribute. Regardless of the method of reconciliation used, its purpose is to provide a single estimate of property value. The RET, therefore, should provide a clear rationale for the approach to reconciling the indicated values. One of the following reconciliation methods may be used:

- a. A single estimate of property value may be selected from alternative value indications if, in the RET's judgment, it is the only meaningful indication of property value. Basing an estimate of value on a single observation generally is undesirable unless it can be shown that the observation is highly informative and clearly superior to others.
- b. Two or more value indications may be combined into a single estimate using a weighted averaging technique. When a weighted average is used, the rationale for the weighing scheme must be documented.

C. INCOME APPROACH

The use of comparable sales is the most direct and accurate method of estimating value. Consequently, an exhaustive search for comparable sales data should be made before considering other appraisal methods. In the absence of similar comparable sales data, the income approach, which measures the value of a property's earning potential, is a viable alternative. The value imputed to a Federal coal property is determined by the expectation of future benefits. The income approach attempts to quantify these benefits into a single indication of value by converting future monetary benefits to present value at a specified discount rate. The process of converting future benefits to present value is called discounting.

The income approach estimates NPV of a Federal coal property by discounting projected annual cash flow to the present. The projected annual cash flow is determined from projected annual revenue, capital and operating costs, taxes, and other expenses. The data required to implement the approach are based on the economic and engineering reports discussed in Chapter II. This information is used to project annual revenue and cost estimates for property development.

The difficulty with using the income approach to value Federal coal property is its reliance on reasonably accurate estimates of potential coal markets and mining costs. Uncertainty in potential coal markets affects the likelihood of selling the coal and the likelihood of the timing of coal production. Uncertainty in produced coal price and capital and operating costs affects the property's income stream. Consequently, the NPV of the income stream obtained by this method depends critically on the quality of the research and the effort given to developing the input parameters. Although methods are presented in this Handbook to account for uncertainty, it is important that all assumptions and input values be reviewed for completeness and soundness before the result of the DCF analysis is accepted as a reasonable estimate of a tract's market value. Because of the uncertainty inherent in this method, an exhaustive search for a similar comparable sale should be made prior to the use of the income approach. Sometimes comparable sale values can be used to bracket an income approach value but only if the situations are

truly similar. The results of the two approaches should not be combined or weighted averaged.

1. Overview of the Income Approach

The general procedure for applying the income approach is as follows (Figure 6):

- a. Assemble Data. The economic and engineering reports provide the economic, market, and technical data.
- b. Develop "Best" Mine Development Plan. Alternative or truncated mine plans contained in the engineering report are developed further to determine the "best" mine development plan for the property. The RET must be able to defend the plan as the "best" development plan for the tract and should acquire the software to make the calculations necessary.
- c. Develop Data. Capital and operating costs, production rate, development schedule, and projected prices and revenues are developed. The RET must be able to defend the selection of data.
- d. Integrate Data. Economic and cost data are integrated to develop estimates of annual cash flow.
- e. Discounted Cash Flow Analysis. The NPV of future benefits is determined by the DCF method.

2. Mine Plan Selection

Alternative mine plans included in the engineering report provide the basis for determining a detailed mine development plan for the property. The property mine plan should represent the "best" development method for the tract as determined by tract-specific characteristics, costs and market. The RET should be prepared to defend the development plan.

A full mine plan may not be necessary for small tracts next to an existing mine. In this case, the mine plan need only show how the Federal tract will be mined so that prorated capital costs, operating costs, and contract coal prices can be applied correctly in the valuation process.

3. Determining Revenues

The production schedule developed from the mine plan should be combined with estimated or known coal price information, from the market study, to determine expected revenues associated with the mine operation. Projected coal prices and salable production should be estimated based on thorough and documented market research and this should be reconciled with mine plan production.

4. Determining Mining Costs

The mining costs developed for the property mine plan include capital and operating expenditures associated with the mine operation. Capital costs and operating expenses are estimated from individual cost elements.

a. Capital Cost Elements

Capital cost elements include expenditures for services, construction, and equipment associated with preproduction activity, mine development, and production. Capital cost elements are as follows:

1. Premining Studies. The premining studies cost element includes expenditures associated with exploration, environmental, and engineering studies. Exploration cost includes all field activity required to define the resource sufficiently for project feasibility analysis and mine design. Environmental cost includes the cost of developing baseline environmental data and establishing mitigation protocol and monitoring activities to ensure compliance with Federal and State regulations. Engineering cost is the cost of engineering design activities, including contractor fees for engineering design and contractor management. Prelease costs also should be included because

bidders probably tend to act as if they are not sunk costs but are overhead. If specific cost data are unavailable, the premining cost element may be estimated as 10 percent of total capital cost.

2. **Site Preparation and Surface Facilities.** Site preparation cost includes expenditures to clear and grub the area in preparation for mining and facility siting. Also, included are costs to provide access to the mine site and to upgrade existing roads. Surface facilities cost includes costs associated with the construction and supply of surface facilities required to support the mining operation. This includes construction costs for general offices, engineering offices, changehouse, maintenance shops, warehouses, and load-out facilities, as well as fixtures and equipment required to support the facilities. Also included are expenditures for the purchase and installation of wells, pumps, treatment facility, piping distribution system, and other items required to supply potable water to the mine site. The surface facility cost element also includes the cost of a mine drainage system and facilities to store explosives, fuel, and water. Data for estimating these costs are provided in industry cost manuals (e.g., Means Building Construction Cost Data), vendors, and mine cost studies.

3. **Mine Equipment.** Mine equipment cost includes purchase and erection cost of all equipment delivered to the site and spares required to sustain production rates specified by the mine plan. Cost includes major equipment items and repairs, and auxiliary items such as fire protection vehicles, small trucks, and other similar items used directly in the mining operation. Equipment costs can be based on vendor quotes.

4. **Preproduction Development.** Preproduction development cost includes the cost of all activities required to bring the mine to full production. For surface mining, these activities include, in part, the drilling, blasting, loading, hauling, and stockpiling of topsoil and overburden prior to coal production. For underground mining, the activities include the development of entries prior to production.

5. **Indirect, Administrative, Contingency, and Working Capital.** Indirect cost accounts for miscellaneous costs not directly attributable to a specific work item. Administrative costs are the general overhead and administrative costs associated with nonproduction activity. Contingency is an allowance to provide for unpredictable costs not known at the time of the estimate. Working capital is the capital required to meet payroll expenses and other billings for material inventory, to carry accounts billings for material inventory, and to carry accounts receivable until revenue is generated. If specific costs cannot be determined, indirect and administrative costs each can be estimated as 2 percent of total capital investment.

6. Sources of Costs. The following are cost Sources:

Publisher Title

Dataquest Cost Reference Guide

Green Guide

Green Guide for off-Highway Trucks

Western Mine Mining Cost Service

Engineering, Inc.

Richardson Engineering Process Plant Construction

Services, Inc. Estimating Standards

R. S. Means Company Means Site Work & Landscape Cost Data

Inc. Means Square Foot Costs

Means Heavy Construction Cost Data

Various Equipment Manufactures Cost Data

b. Operating Cost Elements

Operating costs are expenditures for labor, material, maintenance, utilities, indirect, and fixed costs incurred during mining activities. Operating cost elements are as follows:

1. Labor. Labor cost includes wages for hourly and salaried personnel. Salaried and hourly personnel requirements are determined from production and equipment requirements specified for the mine plan. Hourly labor manpower requirements should be based on regional operating schedules and labor practices. Additional hourly labor personnel should be added to account for vacation, sick leave, and absenteeism. Wage rates should be based on rates prevailing in the region.
2. Materials and Supplies. Equipment supply cost includes expenditures for fuel, lubrication, and other supplies for mining equipment, as well as the cost of scheduled and unscheduled repairs. Equipment operating, maintenance, and supply costs may be estimated from vendor information.
3. Utility. Utility cost is the cost for purchased electric power. Electric power requirements can be determined from estimates of electric power requirements of equipment and surface facilities. Utility cost should be based on prevailing rate schedules obtained from the utility serving the region.
4. Payroll Overhead. Payroll overhead is estimated based on the local experience and may amount to 35-45 percent of direct labor cost.
5. Overhead, Contingency, Indirect and Other Cost. Corporate overhead represents the cost of onsite and offsite overhead operating expenditures such as engineering; it must be included in the valuation process and varies greatly. Contingency is estimated for unexpected facilities operating cost and is also uncertain. The RET should objectively research the appropriate percent charges for the mines in each area and charge the DCF with them. Indirect cost accounts for miscellaneous operating expense not directly attributable to a specific work element. It maybe estimated as 15 percent of the direct labor and supply costs. Other similar costs includes expenditures for workman's compensation, the cost of insuring mine property and equipment against loss, and the cost of insuring against personal injury and property damage liability. Other costs maybe estimated as 2 percent of the total capital investment.

Annual capital and operating costs are based on equipment requirements, manpower requirements, and development schedules derived from the engineering mine plan. These data, combined with projected coal price and other economic data, represent the input to the DCF analysis.

5. Discount Rates

The Department of the Interior currently uses a 10 percent real post-tax rate of return as the discount rate for coal lease evaluation. The reason for selecting a 10 percent rate is that a 8-12 real rate is often used for project evaluation. It is justified on the basis that it is representative of the alternative cost of capital and has been successfully used for a number of years. An example of the use of this 10 percent real after tax rate is that it is the rate required by the Financial Accounting Standards Board for valuing oil and gas reserves for the SEC (F.A.S.B. #69 Nov. 82 P.10). The 10 percent post-tax real rate of return can be checked periodically for consistency with actual tract values.

The 10 percent rate is a return on total assets assuming some average debt-equity mix and to avoid double counting debt financing information should not be input in the DCF analysis. Note also it contains no special project risk factor and this must be included elsewhere in the analysis. For example, if there is a 50 percent chance that the tract will not be developed then the scenarios used to estimate value must be adjusted to include this possibility as

explained in III.C.7.

In addition, the 10 percent real rate includes no premium for a general expected national inflation rate which is generally around 4 percent. To avoid major error this inflation premium must usually be either included or excluded from all three DCF components; i.e. costs, revenues, and discount rate in the DCF. If its to be included, it can be included in the discount rate by adding it to the 10 percent real rate yielding around a 14 percent and to the annual costs and revenues by increasing them both at the 4 percent compound rate for the project duration.

In making this adjustment for inflation by running the analysis in real terms or with inflation in all terms one additional complication can be noted. This complication is that the depreciation and depletion tax expenses discussed below are not adjusted for inflation in the tax law. Thus, they really should be discounted each year at the expected inflation rate in a real terms analysis or held constant at their nominal level in an analysis which explicitly includes inflation.

6. Discounted Cash Flow Analysis and Taxes

Federal coal property value is estimated as the NPV of the projected annual after-tax cash flow of the mine operation. Annual after-tax cash flow is determined from the annual cash income (annual revenue - annual costs and taxes). Both the severance and income taxes must be deducted. The NPV is the sum of the annual after-tax cash flows discounted to the present at a specific discount rate. Although conceptually simple, the application of the DCF method to mineral property valuation can be complex.

One difficulty is that a successful estimation of NPV requires that the income tax consequence of capital investment be handled properly. Consequently, decisions concerning the handling of deductions to determine taxable income for the tax calculation become important considerations to the estimation process. Allowable tax deductions are subtracted from gross income to determine taxable income. Deductions include severance taxes, royalties, operating and other expensed items, depreciation, and depletion. Income taxes are calculated as a percentage of this taxable income. To derive annual cash flow, annual gross revenues in each year are reduced by cash cost outlays including cash tax payments. Tax calculations for the DCF are fully explained in Stermole, Economic Evaluation and Investment Decision Methods 1993.

The application of the income approach using the DCF analysis to estimate value of a Federal coal property is illustrated in Figures 7 and 10.

7. Incorporating Uncertainty in the Valuation Process

It generally is acknowledged that estimates of fair market value inherently are uncertain. Despite attempts to develop the most accurate applicable data, differences in property valuation will vary among appraisers. The valuation of a Federal coal property using DCF techniques either to directly determine an estimate of value or to adjust comparable sales data depends on estimates of future events. These events cannot be estimated with certainty. For example, there is uncertainty in the market potential for the coal under lease. This uncertainty affects estimates of future coal prices and the timing of coal production. There is uncertainty in mining costs that affect the income stream from which value is estimated. And there is uncertainty in future Government regulations that affect the risk associated with lease development.

Uncertainty may be incorporated in the valuation process through a number of analytical techniques. These techniques range from a sensitivity analysis that evaluates the effect on value of input parameter variation to an adjustment of the discount rate to account for risk. The Handbook discusses four techniques to incorporate uncertainty in the analysis. The techniques are as follows:

Probability Weighted Scenarios. A procedure by which the likelihoods of expected outcomes are combined to yield an expected value.

Monte Carlo DCF Analysis. A probabilistic form of sensitivity analysis in which the probabilistic variation in

input parameters is systematically incorporated in the DCF analysis to yield an expected value.

Marketing Uncertainty. A procedure that discounts the estimated value based on subjective criteria linked to the likelihood of property development.

Timing of Development. A procedure that incorporates development timing variation in the analysis to adjust for market uncertainties.

An additional technique is to incorporate a risk premium in the discount rate to account for the higher returns required by the inventor to draw investment capital to riskier ventures. The increased rate frequently serves as a proxy for the potential buyer's uncertainty of future events. In general, the use of a discount rate adjustment to account for risk is not recommended because of the overwhelming subjectivity involved in selecting the risk premium.

a. Probability Weighted Scenario

Despite efforts to provide an accurate measure of property value through the estimation of its NPV, uncertainty is an important and unavoidable factor in the valuation procedure since it is impossible to obtain perfect information for all the DCF inputs, some of which depend on future events. Uncertainty can be included in the valuation procedure by using probabilistic methods. The simplest probabilistic method is to calculate the results of several alternative scenarios and to combine them by assigning a probability estimate of occurrence to each scenario. This procedure is illustrated in Figure 8.

b. Monte Carlo DCF Analysis

An additional probabilistic method is the application of the Monte Carlo simulation technique to the DCF method. This method requires the development of probability distributions for the input variables. Often, insufficient data limits the precise development of probability distributions; however, assumed distributions (normal, triangular, uniform, etc.) and variances (+ 25%, 50%, etc.) may be used based on an evaluation of the data. Repeated application of the DCF method using Monte Carlo simulation generates an NPV distribution from which a single-weighted average (the expected NPV) can be determined. The variances selected for the Monte Carlo simulation are especially important because of the "options" effect resulting from large gains in a few large development runs. For example, higher variances may raise values of average case properties from zero to a significant amount. Also as a related matter care needs to be taken to limit losses on negative runs to actual loss due to non-development.

c. Marketing Uncertainty

The marketing uncertainty method reflects the uncertainty in marketing or developing coal properties by assigning an additional discount factor to adjust the estimated value for the likelihood of development during the 10-year diligence period or other applicable period. This factor is applied as a percent discount to the NPV determined by the DCF analysis which is netted against non-development cost times its likelihood.

Because of the subjectivity inherent in selecting a discount factor, the selection must be discussed thoroughly among RET members, and the rationale for its use must be fair and reasonable (see Figure 8).

A market analysis prepared for the mine in Figure III-7 indicated a 50 percent probability that the coal will sell for \$9.50 per ton, a 40 percent probability that the coal will sell for \$9.00 per ton, and a 10 percent probability that the coal will sell for \$10.00 per ton.

The net present value is computed for each selling price:

1. Scenario 1: Coal price = \$9.00 per ton

(probability of occurrence = 0.4)

NPV = 13 cents per ton

2. Scenario 2: Coal price = \$9.50 per ton

(probability of occurrence = 0.5)

NPV = 26 cents per ton

3. Scenario 3: Coal price = \$10.00 per ton

(probability of occurrence = 0.1)

NPV = 37 cents per ton

The probability weighted (expected) net present value is:

NPV = 0.4 (13) + 0.5 (26) + 0.1 (37) = 21.9 cents per ton

Weighted Scenario Analysis

A market analysis prepared for the mine in Figure III-7 indicates a 30 percent probability that the coal might not be sold within the 10-year diligence requirement. If a market is found, the coal will sell for \$9.50 per ton. The effective tax rate is 50 per cent. Because of the lead time required for production, a decision not to develop the lease will be made at the end of the fourth year into the lease if no market develops. The bonus bid is expensed against other income at the end of the fourth year if a decision is made not to develop the lease.

The NPV of the produced coal income stream (NPV p) is:

NPV p = \$26,048,000

The NPV of the income stream if coal is not produced (NPV np) is:

NPV np = (0.5) B x PWF

where

B = lease bonus bid

PWF = present worth factor.

The lease bonus bid is calculated as follows:

$(1-0.3) \text{ NPV}_p + 0.3 \text{ NPV}_{np} - B = 0$

$0.7 (26,048,000) + 0.3 (0.5) B (0.683) - B = 0$

The lease bonus bid is

B = 20.3 cent per ton.

d. Timing of Development

Uncertainty in coal marketability may be incorporated in the analysis by adjusting the time that mine development begins. For example, if a market analysis suggests that the prospects for selling leasable coal may be delayed until market uncertainty clears, the development and production timing should be adjusted in the model to simulate the most likely market scenarios. This adjustment has the effect of displacing costs and revenues into the future, thus reducing the present value of the income stream. Timing of development assumptions can be used either separately or in combination with the other techniques described above.

8. Computer Models for Mineral Property Valuation

a. DCF Computer Program

The complexity of the DCF method for mineral property valuation has led to the development of specialized computer programs. The NRET Coal Spread Sheet Model and the Colorado School of Mines SEE model are examples of computerized DCF programs that are being used for Federal coal lease evaluation.

A DCF computer program simulates the accounting procedure used to determine annual cash flow of a mineral project and to develop a NPV of the cash flow stream. The financial components used to determine net cash flow are illustrated in Figure 9. Generally, the user provides exogenously the input data required by the program to perform the DCF analysis. However, the DCF program may be combined with mine simulation and costing algorithms to provide a complete formulation of the mine economic evaluation. Uncertainty in input values may be handled through sensitivity analysis in which key input parameters are varied selectively through their range of probable values.

b. Monte Carlo DCF Computer Program

The need to incorporate uncertainty in the valuation process resulted in the refinement of DCF computer model to permit Monte Carlo simulation. Uncertainty in input values is handled by the Monte Carlo simulation program by using assumed probability distributions of input variables rather than point estimates. The simulation randomly samples each variable from its probability distribution and performs the DCF calculation. Repeated application of the simulation results in a frequency distribution of the net present values from which an expected value of NPV can be determined. At the present time the only monte carlo feature being used is that in the NRET coal spread sheet model which has incorporated uncertainty in the inputs such as projected prices through the use of the @RISK program.

In Monte Carlo simulations, some combinations of input values may yield negative NPVs. A negative NPV indicates either a reduced rate of return on investment (i.e., a rate of return less than the discount rate used in the simulation) or an actual loss, depending on its magnitude. In performing an appraisal, negative values will be included in the NPV distribution; however, they will be accounted for as follows: substitute the predevelopment cost whenever a negative NPV goes below this level. That is, it is assumed that unprofitable mines are not developed and developed mines are not abandoned.

c. Mining Simulation and Costing Algorithms

Mine simulation and costing algorithms are available to assist the RET in developing annual capital and operating cost estimates. Surface and underground coal mining cost computer models have been developed which provide procedures for estimating detailed capital and operating costs and other requirements of proposed or existing mine operations. Most mine costing models simulate the engineering processes used to produce coal through either surface mining or underground mining. The costing algorithms essentially are accounting procedures which contain several distinct steps for establishing production costs. An overview of the elements of a typical engineering process model for mine costing is illustrated in Figure 10.

An engineering process model consists of algorithms that model the discrete activities associated with coal production. These activities are defined by the mine plan and mine technology chosen for the property development. Using this information, an engineering process model can generate equipment requirements,

manpower requirements, material requirements, and support requirements for the production activity. Capital and operating costs are developed from these requirements. These costs are used to generate annual cash flow from which a net present value of the income stream can be determined.

The RET is encouraged to use mine simulation and mine costing algorithms to reduce the time required to prepare an appraisal. A suitable process model should be verified to be realistic periodically, and have the following characteristics:

1. Surface and underground coal mine process models must be able to model all regional mining methods to permit the RET to investigate alternative plans for coal property development. Modern software of this type is available which can greatly facilitate these calculations.
2. All mining activities from exploration to reclamation should be represented in the model or should be available elsewhere so that the total mining cost can be estimated.
3. Mining processes should be developed in sufficient detail to reasonably simulate mining activity so that mine costs are accurately generated for a particular region and mine.
4. The process model should be sufficiently flexible to allow changes in input parameters and cost data bases.

D. APPLICATION OF APPRAISAL METHODS TO FEDERAL COAL LEASE TRACTS

In this section, the appraisal methods discussed above are applied to the valuation of Federal coal lease tracts. Three types of Federal coal lease tracts are described, and the use of the comparable sales approach and the income approach is discussed for each tract type. For convenience, the Federal coal lease tract types are classified as Type 1 tracts, Type 2 tracts, and Type 3 tracts. Each tract type is defined as follows:

Type 1 tract. A single tract that constitutes a mining unit (MU) for a new mine operation. The tract contains sufficient reserves that can be developed and mined in an efficient, economic, and orderly manner with due regard for the conservation of coal resources and other resources.

Type 2 tract. A single tract that constitutes a portion of an MU for a new mine operation. The tract does not contain sufficient reserves to independently support a mining operation; however, the reserves can be used with other contiguous reserves to create an MU for a new mine operation.

Type 3 tract. A single tract that constitutes an increment to an existing mine operation. The tract does not contain sufficient reserves to independently support a mining operation; however, the reserves can be mined economically in conjunction with an existing mine(s) operation.

Previous Federal coal property valuation procedures did not explicitly distinguish between different property types. The Commission on Fair Market Value Policy for Federal Coal Leasing in its examination of the Department's appraisal methods recognized a distinction between properties that are potentially valuable to several firms for which a reasonable degree of competition may be expected from the bid process and "captive" properties that can be developed economically only in conjunction with adjacent tracts and therefore tend to be of interest to only one firm.

The Commission recommended that a Federal coal lease tract captive to a neighboring mine be appraised according to its value to the adjoining mine or coal owner, rather than on its "competitive" or "stand-alone" value. The classification system described above permits the Federal government to distinguish between various tract types to implement the Commission's recommendation. In the discussion of the appraisal methods that follows, a captive tract is not a separate classification, but is grouped under a larger classification for appraisal purposes.

Specifically, a captive tract that constitutes a portion of a new mine operation is classified as a Type 2 tract and usually is valued according to its proportional contribution to total mine value. A captive tract that constitutes a

portion of an existing mine operation is classified as a Type 3 tract and is valued according to its incremental contribution to total mine value. This valuation procedure is consistent with the recommendations of the Commission.

This section describes the application of the comparable sales approach and the income approach to the estimation of FMV of each Federal coal lease tract type. First, the comparable sales approach is discussed. Comparable sales that may be used to estimate FMV are presented for each tract type. Then the steps required to apply the comparable sales approach are delineated. Next, the income approach is discussed, and the steps for applying the income approach are delineated. Finally, other considerations required to apply the methods to the tract type are presented.

1. Valuation of Type 1 Tracts

A Type 1 Federal coal lease tract is a tract that can be an MU for a new mine operation. Comparable sales that can be used to value Type 1 tracts include:

Sale of an entire MU for a new mine operation.

Sale of a portion of an MU for a new mine operation.

Sale of a relatively large addition to mine reserves

a. Unadjusted Comparable Sales

Use the unadjusted value of a comparable sale to estimate the value of a Type 1 tract when it can be shown that the attributes of the comparable tract are sufficiently similar to the attributes of the Federal tract that an adjustment to the comparable sale price to account for differences does not provide a better estimate of value. If an unadjusted comparable sale is used, set the FMV of the Federal tract equal to the selling price (per ton) of the comparable tract:

FMV = selling price per ton of comparable tract.

Multiple unadjusted estimates of FMV are reconciled into a single estimate of value either by selecting a clearly superior value from the multiple estimates or by combining the estimates using a weighted averaging scheme, as discussed in Section III.B.4.

b. Adjusted Comparable Sales

Use the DCF-adjusted value of a comparable sale to estimate the value of a Type 1 tract when it is necessary to account for differences in tract attributes. If a DCF-adjusted comparable is used, set the FMV of the Federal tract equal to the adjusted selling price (per ton) of the comparable tract. The adjusted selling price is computed as follows:

1. Estimate the NPV of the comparable tract. The NPV of the comparable tract (MU) is estimated using a DCF analysis. First, a mine plan for the comparable tract is developed. Next, capital costs and annual operating costs are estimated. The costs and revenues are combined to determine annual cash flow. The annual cash flow is discounted to the present to yield an estimate of the NPV of the comparable tract. The NPV is divided by the total tonnage of the MU to determine a value per ton.

$$\text{NPV}_{\text{comp}} = \text{NPV}_{\text{mu}} / \text{MU tons}$$

2. Estimate the NPV of the Federal tract. The NPV of the Federal tract also is estimated using a DCF analysis, as

described above. The NPV is divided by the total tonnage of the Federal tract to determine a value per ton.

====

$$\text{NPV}_{\text{fed}} = \text{NPV}_{\text{fed}} / \text{tract tons}$$

3. Determine the adjustment to the comparable sale price. The comparable sale price is adjusted by either an arithmetic adjustment factor or a proportional adjustment factor. The adjustment factor is calculated as follows:

(a) Arithmetic adjustment factor:

====

$$D = \text{NPV}_{\text{fed}} - \text{NPV}_{\text{comp.}}$$

(b) Proportional adjustment factor:

====

$$R = \text{NPV}_{\text{fed}} / \text{NPV}_{\text{comp.}}$$

4. Estimate FMV. Set the FMV of the Federal tract equal to the adjusted comparable tract selling price.

(a) Arithmetic adjustment:

====

$$\text{FMV} = \text{comparable tract selling price (per ton)} + D.$$

(b) Proportional adjustment

====

$$\text{FMV} = \text{comparable tract selling price (per ton)} \times R.$$

5. Reconciliation of Multiple Estimates. Multiple adjusted estimates of FMV are reconciled into a single estimate of value either by selecting a clearly superior value from the multiple estimates or by combining the estimates using a weighted averaging scheme, as discussed in Section III.B.4. Usually, the superior comparable can be selected before multiple DCF adjustment runs are made

c. Income Approach

Use the income approach to value Type 1 tracts when comparable sales data are unavailable. The income approach is discussed in Section III.C. and is summarized as follows:

1. Develop a mine plan. A mine plan for the tract is developed. The mine plan represents the development of the property in a reasonable and realistic manner. It is based on an assumed production rate and development schedule. This production rate and schedule must be consistent with the market analysis in the Economic Data Report.

2. Develop cost data. Capital costs, annual operating costs, and projected revenues are estimated.

3. Develop annual cash flow. Annual cash flow is determined from revenues, costs, and taxes.

4. Estimate FMV of the tract. The NPV of the tract is determined from the annual cash flow using a DCF analysis. The FMV per ton of the tract is estimated by dividing the NPV by the tract tonnage.

$$\text{FMV/ton} = \text{NPV} / \text{tract tons.}$$

The mine plans used in the estimation procedures are based on developing the property in a realistic manner; consequently, the most-likely mining method, development schedule, and production rate form the basis of the mine plan. Estimates of capital investment and operating costs proceed logically from the mine plan. All costs are based on current equipment prices and current labor rates.

The mine plans are developed for an MU. If a comparable tract is a portion of an MU, the value of the comparable tract is assumed equal to the value (per ton) of the entire MU.

An example of the valuation of a Type 1 tract is illustrated in Figure III-11.

2. Valuation of Type 2 Tracts

A Type 2 Federal coal lease tract is a tract that is a portion of an MU for a new mine operation. A Type 2 tract cannot be mined economically as an independent unit. Its value is derived from the value of the MU to which it is attached. Comparable sales that can be used to value Type 2 tracts include:

Sale of an entire MU for a new mine operation.

Sale of a portion of an MU for a new mine operation.

a. Unadjusted Comparable Sales

Use the unadjusted value of a comparable sale to estimate the value of a Type 2 tract when it can be shown that the attributes of the comparable tract are sufficiently similar to the attributes of the Federal tract that an adjustment to the comparable sale price to account for differences does not provide a better estimate of value. If an unadjusted comparable is used, set the FMV of the Federal tract equal to the selling price (per ton) of the comparable tract:

—

$$\text{FMV} = \text{selling price per ton of comparable tract.}$$

Multiple unadjusted estimates of value are to be reconciled, as discussed in Section III.B.4.

b. Adjusted Comparable Sales

Use the DCF-adjusted value of a comparable sale to estimate the value of a Type 2 tract when it is necessary to account for differences in tract attributes. If a DCF-adjusted comparable is used, set the FMV of the Federal tract equal to the adjusted selling price (per ton) of the comparable tract, as discussed in Section III.D.1.b. Multiple adjusted estimates of value are to be reconciled, as discussed in Section III.B.4.

c. Income Approach

Use the income approach to value Type 2 tracts when comparable sales data are unavailable, as discussed in Section III.D.1.c.

The mine plans used in the estimation procedures are based on developing the property in a realistic manner; consequently, the most-likely mining method, development schedule, and production rate form the basis of the mine plan. Estimates of capital investment and operating costs proceed logically from the mine plan. All costs are

based on current equipment prices and current labor rates.

More than one MU may be possible for the Federal tract. Select the MU configuration that is most likely to be developed. If all MU configurations are equally likely to be developed, select the most profitable MU. The value of the Federal tract (per ton) is determined as follows:

—

$$NPV_{fed} = NPV_{max} / \text{MU tons.}$$

In the adjusted comparable sale approach, the value NPV fed is used to determine the adjustment factor. In the income approach, the FMV of the tract is set equal to NPV fed.

An example of the valuation of a Type 2 tract is illustrated in Figure 12.

d. Alternative Procedures for Valuing Type 2 Tracts

Alternative procedures for estimating value of a Type 2 tract should be used if the characteristics of the Federal tract differ significantly from the characteristics of the property to which it may be combined.

1. The Federal tract is needed to make an MU in combination with existing contiguous tracts.

In this situation, the average values of the Federal tract characteristics differ significantly from the average values of the characteristics of the remaining tracts. The remaining tracts do not independently form an MU and the Federal tract is required to form an economic unit. Basing the FMV of the Federal tract on the procedures described above will yield an average tract value that will either undervalue or overvalue the Federal tract's contribution to the overall value of the MU. The procedure is as follows:

(a) Calculate the NPV of the entire MU using the Federal tract properties. The calculation yields an average NPV per ton for the MU. The total value of the Federal tract is calculated from the average value and its tonnage as follows:

—

$$NPV_{ft} = NPV_{ft} \times T_{ft}.$$

—

where NPV_{ft} = NPV per ton of entire mining unit excluding the effect of the "remaining tracts."

T_{ft} - total Federal tract tonnage.

—

Thus the guidance usually is to select ($T_{ft} \times NPV_{ft}$) as the most realistic value and use it for comparable sales adjusted value calculations or fair market value. This is shown in Figure 13.

b. Alternatively, if the tract is obviously an incremental addition to a blocked up potential mine, the guidelines presented in Section III.D.3. for Type 3 tracts can be used.

3. Valuation of Type 3 Tracts

A Type 3 Federal coal lease tract is a tract that is an increment to an existing mine operation. A Type 3 tract cannot

be mined economically as an independent unit. Its value is based on its incremental value to the existing mine operation and not on its "stand-alone" value to the Federal government. Comparable sales that can be used to value Type 3 tracts include:

Sale of a Type 3 tract. The tract is an increment to an existing mine. The price should result from a transaction between a knowledgeable buyer and seller, neither of which were obligated to buy or sell. Also, it is preferable that the seller actively be in a reasonably good bargaining position to approximate the relative position of the Federal government in these sales. It is important that the situation of the comparable tract with respect to the mine and its reserves be similar to the offered tract. If it is not, an incremental estimate by the income approach may be superior. This is especially true of bypass tracts in mines with large reserves.

Sale of other type tracts.

- Sale of a tract that is an entire MU for a new mine operation (Type 1 tract).
- Sale of a portion of an MU for a new mine operation (Type 2 tract).

The use of a Type 1 or a Type 2 tract to estimate value of a Type 3 tract may be less reliable than the use of an appropriate prior sale of a Type 3 tract. The use of a similar situation Type 3 tract is preferred since valuation is based on its incremental value to the existing mine operation rather than its average value. If the offered tract situation is unique with regard to the mine and its reserves, an incremental estimate using the income approach may be superior. This is particularly true of bypass tracts.

a. Unadjusted Comparable Sales

Use the unadjusted value of a comparable sale to estimate the value of a Type 3 tract when it can be shown that the attributes of the comparable tract are sufficiently similar to the attributes of the Federal tract that an adjustment to the comparable sale price to account for differences may not provide a better estimate of value. If an unadjusted comparable is used, set the FMV of the Federal tract equal to the selling price (per ton) of the comparable tract:

—

FMV = selling price per ton of comparable tract.

b. Adjusted Comparable Sales

Use the DCF-adjusted value of a comparable sale to estimate the value of a Type 3 tract when it is necessary to account for differences in tract attributes. If a DCF-adjusted comparable is used, set the FMV of the Federal tract equal to the adjusted selling price (per ton) of the comparable tract. The adjusted selling price represents the incremental value of the Federal tract to the existing mine operation. It is estimated as follows:

1. Estimate the NPV of the comparable tract.

(a) The comparable tract is an increment to an existing mine (Type 3 tract).

The incremental NPV of the comparable tract is estimated using a DCF analysis. First, estimate the NPV (NPVold) of the existing mine operation adjacent to the comparable tract. The NPV is determined from the annual cash flow that would have occurred without the addition of the comparable tract. Next estimate the NPV (NPVnew) of the combined existing mine and comparable tract. Then calculate the incremental value (per ton) of the comparable tract as follows:

$$\text{NPV}_{\text{comp}} \text{ (per ton)} = (\text{NPV}_{\text{new}} - \text{NPV}_{\text{old}}) / \text{comparable tract tons.}$$

(b) The comparable tract is a Type 1 or a Type 2 tract.

The average NPV of the comparable tract is estimated using a DCF analysis. Estimate the NPV of the MU that includes the comparable tract. (Note: the MU and the comparable tract may be identical or the MU may contain the comparable tract. See Section III.D.2.) Calculate the value (per ton) of the comparable as follows:

$$\text{NPV}_{\text{comp}} (\text{per ton}) = \text{NPV}_{\text{mu}} / \text{MU tons.}$$

2. Estimate the incremental NPV of the Federal tract. The incremental NPV of the Federal tract is estimated using a DCF analysis. First, estimate the NPV (NPV_{old}) of the existing mine operation adjacent to the Federal tract. Next estimate the NPV (NPV_{new}) of the combined existing mine operation and Federal tract. Then calculate the incremental value (per ton) of the Federal tract as follows:

$$\text{NPV}_{\text{fed}} (\text{per ton}) = (\text{NPV}_{\text{new}} - \text{NPV}_{\text{old}}) / \text{Federal tract tons.}$$

3. Determine the adjustment to the comparable sale price. The adjustment may be either arithmetic or proportional. The adjustment to the comparable sale price is calculated as follows:

(a) Arithmetic adjustment factor:

$$D = \text{NPV}_{\text{fed}} (\text{per ton}) - \text{NPV}_{\text{comp}} (\text{per ton})$$

(b) Proportional adjustment factor:

$$R = \text{NPV}_{\text{fed}} (\text{per ton}) / \text{NPV}_{\text{comp}} (\text{per ton})$$

4. Estimate FMV. Set the FMV of the Federal tract equal to the adjusted comparable tract selling price.

(a) Arithmetic adjustment:

$$\text{FMV} (\text{per ton}) = \text{comparable tract selling price} (\text{per ton}) + D.$$

(b) Proportional adjustment:

$$\text{FMV} (\text{per ton}) = \text{comparable tract selling price} (\text{per ton}) \times R.$$

c. Income approach

Use the income approach to value a Type 3 tract when comparable sales are unavailable. The incremental value of the Federal tract is estimated as follows:

1. Develop mine plans.

(a) Current mine operation. Develop a mine plan for the current mine operation using historical and projected production rate and development schedule.

(b) Combined mine operation. Develop a mine plan for the combined mine operation (existing mine operation plus Federal tract) using historical and projected production rate and development schedule.

2. Develop cost data. Estimate capital cost, annual operating cost, and revenues for each mine plan using current prices for original and replacement equipment, labor rates, and additional capital investment. Use the coal contract price, as applicable, to estimate revenues.

3. Develop annual cash flow. Annual cash flow is determined from revenue, capital and operating costs, and taxes. The annual cash flow for each mine plan is developed for the period that starts at the appraisal date. Prior year

capital costs of the existing mine are considered sunk and the mine model is run to the end of the mine life.

4. Estimate FMV of the Federal tract. Estimate the NPV of the current mine operation (NPV_{current}) and the NPV of the combined mine operation (NPV_{combined}) using a DCF analysis. Calculate the incremental value (per ton) of the Federal tract as follows:

$$\text{NPV}_{\text{fed}} (\text{per ton}) = (\text{NPV}_{\text{combined}} - \text{NPV}_{\text{current}}) / \text{Federal tract tons}$$

Set the FMV of the Federal tract equal to the incremental value.

$$\text{FMV} (\text{per ton}) = \text{NPV}_{\text{fed}} (\text{per ton})$$

In some estimations, the Federal tract may be combined with more than one existing mine operation. Select from the most likely alternative configurations the combined operation that results in the largest incremental value. Then set NPV fed equal to that value and estimate FMV as described above.

An example of the valuation of a Type 3 tract is illustrated in Figure 14.

d. Notes on Valuing a Type 3 Tract

Type 3 tract value is estimated from the incremental value added to an existing mine by the addition of the Federal property. Incremental value is determined by estimating the existing mine value in its current state (without the Federal property) and in its potential state (with the Federal property). The incremental difference in property value represents a value added that is attributable to the Federal property. As discussed above, the estimation of incremental value may be determined from either comparable sales data or cost/revenue data as follows:

The incremental value is based on the value of a direct comparable tract that is incremental to an existing mine.

The incremental value is based on the value of a comparable tract that is not incremental to an existing mine but can be used to approximate an incremental comparable tract.

The incremental value is based on the NPVs obtained by DCFs modeling of the existing mine with and without the Federal property.

In performing a DCF analysis to value a Type 3 tract, the following factors should be considered:

1. The existing mine contract coal price should be used in the valuation process when it is the appropriate projected price.
2. The mine costs used in the analysis are to be based on the current cost of new equipment, labor, and other capital cost elements. The mine plan should be based on neighborhood mine data, if available. Estimates of equipment, capital, and labor requirements should be derived from the neighborhood mines if available.
3. The remaining life after mine out, of equipment and other capital investment are to be credited as salvage to the existing mine operation to avoid misallocating appropriate Federal tract long run investment costs. Salvage value is calculated as the percentage of actual life remaining multiplied by its value at current replacement cost.

The DCF analysis is based on an existing mine plan, if available. Generally, the start of mine development in the plan will have begun in a year prior to the current year. However, it will be assumed for the with and without DCF analysis that historical years and costs are gone (they cancel) and that events start in the current year (or in the year for which lease value is to be estimated). If the DCF tract analysis is not a with and without and is a simple DCF instead, the offered tract must be charged for the prorata remaining value (alternative cost) of the existing mine equipment it uses.

Another concern to be kept in mind is that the incremental method is quite sensitive to total existing mine reserves and production rate estimates. Both estimates should be reviewed by the RET to check for reasonableness and likelihood of occurrence so that the over- or underestimation of tract value is avoided.

4. Special Considerations

The procedures discussed above are not meant to constrain the RET to applying specific appraisal methods when their application would be inappropriate. The RET has the flexibility to apply alternative methods to obtain an estimate of value if sufficient information is unavailable to credibly apply the procedures or the situation requiring valuation does not readily adapt to the methods described. In these special cases, the RET may use whatever information is available to develop an estimate of value. The estimate of value must be derived in a reasoned manner. For example, a situation may arise where it is necessary to value a small coal tract for a short-term emergency lease and it is known that mining the tract would be unprofitable. In this case, it might be inappropriate to model the tract or to use DCF based analyses to estimate value. An alternative approach would be to develop an estimate of value based on the information known about the mine operation requiring the emergency lease. This approach is acceptable, provided the value estimate is not arbitrary and it can be shown to be derived in a reasoned manner.

An additional special consideration is the need to make special adjustments such as those for delayed payment of the bonus. In this case the estimated FMV from must be increased to reflect the delay in the payment of the bonus. This increase should be the discount rate times the amount delayed for the years of delay.

IV. PREPARATION OF PRESALE APPRAISAL REPORT

A. INTRODUCTION

Appraisal reports prepared for the Bureau of Land Management (BLM) should follow the general reporting standards described in the Uniform Appraisal Standards for Federal Land Acquisitions, 1992 and The Appraisal of Real Estate, 1992. The appraisal report should be prepared in a narrative format and should use clear, concise language to ensure that the report is understandable to readers. Appraisals must be based on accurate data and logical reasoning. Estimates of value cannot be based on unsupported opinions or personal belief. The report should contain sufficient data and supportable analysis to justify the estimate of FMV.

B. APPRAISAL REPORT STRUCTURE

Each appraisal report should contain introductory material, factual data, analysis and conclusions, and exhibits and addenda, following the outline presented below.

1. Summary Page

The first page of the appraisal report summarizes the appraisal information and conclusions. It contains only brief descriptions of the information presented. The information included on the summary page is as follows:

- a. Tract Name and Location. Identify the tract and list the county and State in which it is located.
- b. Purpose of Appraisal. Describe briefly the purpose of the appraisal and include the effective date of the estimate. The description should be a one-line statement.
- c. Appraisal Method. State the method of appraisal.
- d. Legal Description of Tract(s). Tabulate the legal description of the tract(s) being appraised in terms of:

1. Township

2. Range

3. Meridian

4. Section

5. Subdivision

6. Acreage

e. Appraisal Summary. List the estimated FMV for the tract(s). The appraised value(s) should be presented in cents/recoverable ton, dollars/acre, and total value.

f. Signature. The chief of the RET will sign and date the summary page. The qualified mineral review appraiser and the Deputy State Director Mineral Resources may also sign on this page.

2. Table of Contents

A table of contents is recommended for long reports.

3. Introduction

The introduction provides an introductory overview of the appraisal. It addresses the purpose of the appraisal and discusses the general assumptions, directions, and guidance for the appraisal.

4. Appraisal Tract Description

- a. Legal Description

This section provides a complete legal description of the tract(s) being appraised. If the description is lengthy, include it as an appendix and refer to it in the text. At a minimum, include the items listed below. Document all sources of data such as:

1. Tract identification or name

2. Township

3. Range

4. Meridian

5. Section

6. Subdivision

7. Total acreage and the acreage used to estimate FMV (if it differs)

- b. Appraisal Tract Data

Discuss all pertinent information about the appraised tract(s). At a minimum, include the items listed below. Document all sources of data.

1. Total acres, coal acres, economically recoverable coal acres
 2. Location in region and proximity to transportation and coal markets
 3. Type of tracts (e.g., new production, captive)
 4. Coal reserves (e.g., geological description, seams, resource base, reserves)
 5. Coal quality (i.e., Btu/lb, % moisture, % ash, % sulfur, % volatile matter, % fixed carbon)
 6. Supporting documentation (e.g., maps)
 7. Other important qualities, when applicable (e.g., high sodium)
5. Analysis

The analysis section discusses the procedure for determining the value of the Federal coal property.

a. Appraisal Method

An overview of the coal property appraisal technique is presented. The overview includes a discussion of appraisal approaches and appraisal criteria. The methods of obtaining data, appraisal approaches, and the reconciliation method are briefly discussed. The type and quality of available data determine the appraisal method used. Both the reasons for selecting the method and the reasons for rejecting alternative approaches are discussed.

b. Value Estimated by the Comparable Sales Approach

All comparable sales transactions used must be confirmed by persons having knowledge of the price, terms, and conditions of the sale. Discuss each comparable in relation to the tract being appraised.

1. General Considerations. Several general considerations should be included in the appraisal process:

(a) All data considered in the valuation process should be discussed (e.g., comparable sale transactions that may not have been included in the valuation). Support must be provided for including or excluding sales from the appraisal process.

(b) All sales investigated (including sales subsequently rejected) having a reasonable degree of comparability are included. Each sale is included for direct, detailed comparison.

(c) Comparable sales should be identified clearly and consistently to permit cross reference with comments made in the appraisal report.

(d) Support must be developed for an adjustment made in the valuation process. The characteristics that lead to an adjustment are to be established.

(e) Comparisons are usually made on a sale basis, rather than a characteristic basis. Discuss each sale fully and consider all differences before proceeding to the next sale. Complete the discussion of each sale by considering the characteristics leading to the adjustment and conclude with an overall comparison with the tract being appraised.

2. Data Acquisition. Efforts to acquire data and the sources from which raw data were obtained should be discussed. Include a discussion of how the data are selected and verified.

3. Data Presentation. Data documentation must be presented in a manner that would allow the reader to duplicate

the data acquisition. Documentation of the data used for direct comparison must be included as a narrative comparison and a comparison summary chart. Identify the data type and essential facts relating to the comparative property that document qualitative and quantitative differences between it and the offered tract. All records and supporting data and documentation must be maintained in auditable files at the BLM field offices. The files will contain all documentation pertaining to the appraisal and supporting its conclusions. The files may also include maps, transaction documentation, telephone conversations, memos, and any other pertinent information.

4. Data Analysis. In this case fair market value is estimated by the comparable sales approach using unadjusted comparable transactions, adjusted comparable transactions, or regression analysis. Discuss the considerations which resulted in the selection of a particular valuation procedure. If an unadjusted comparable is used, develop support for basing value on an unadjusted selling price. If an adjusted comparable transaction is used, present the data that supports the need for an adjustment.

(a) Comparison Factors. Various mineral property characteristics are recognized by the market as influencing value. These factors should be identified, discussed, and analysed to develop support for a comparable sale. Characteristics to be considered include:

- o Date of sale
- o Sale price
- o Lease market conditions
- o Produced coal market prospects
- o Total lease acres
- o Total coal acres
- o Average coal thickness
- o Average overburden thickness
- o Average stripping ratio
- o Recoverable coal resource estimate
- o Coal quality
- o Transportation and marketing
- o Lease terms
 - royalty rates
 - payment terms
 - items sold
- o Other factors

(b) Adjustment. An adjusted transaction accounts for differences in the characteristics between the comparable property and the offered tract. Discuss the differences in tract characteristics that require adjustment. Show how

these differences are incorporated into the adjustment estimation process through the DCF method. Include a discussion of the arithmetic or proportional adjustment procedure.

5. Reconciliation of Comparable Values. Multiple estimates of value are reconciled into a single indication of value. Discuss the reconciliation method and the rationale for estimating weights (if used).

c. Value Estimated by Income Approach

Adequate factual data to support the appraisal analysis should be included. The present value of net income method used must be explained in narrative form and supported by a statement of sources and factors.

1. Data Acquisition, Selection, and Documentation. The efforts to acquire data and the sources from which the data were obtained should be described. Include a discussion of how the data are collected and verified. Discuss the rationale for selecting specific data elements. The data acquisition should be documented in such a manner that data acquisition may be duplicated. All records and supporting documentation should be maintained in auditable files at the BLM field offices. The files should contain all documentation pertaining to the appraisal and supporting its conclusions. The files may include maps, names, telephone conversations, and any other pertinent information.

2. Mine Plan. The development of the mine plan should be described and supported. Refer to the tract and mine characteristics and regional mining methods to support the mine type, production rate, equipment selection, manpower requirements, and other pertinent factors.

3. Marketing. The market situation for coal from this lease should be described and supported. Regional supply/demand, development timing, likelihood of market, coal quality, coal prices, and other relevant information should be explained.

4. Estimated Production Costs and Revenues. The method for developing mine production costs must be described and supported. Include an explanation of the model(s) used (if any) and its input requirements. Production revenues should also be estimated from coal prices and production rates.

5. Capitalization Technique. The DCF method used should be discussed. Indicate the input requirements and discuss how they were developed for the analysis. If a probabilistic method is used, discuss how probability weights, scenarios, timing, or Monte Carlo inputs (distributions and variances) were developed.

6. Summary and Indication. A summary of the basic steps and the final market value indication from the income approach should be included following the income approach narrative.

6. Exhibits or Addenda

All exhibits needed in the mineral property valuation process, in addition to those used in the body of the report, should be included. Detailed data and information pertaining to the property or other important valuation factors that are too lengthy for the body of the report or that distract from a coherent presentation should be placed in this section.

C. SIGNATURE

The chief of the RET will sign and date the appraisal report. The report will be submitted to the designated Deputy State Director for signature after review and signature by a qualified mineral review appraiser as explained in Chapter V. section B.

D. CONFIDENTIALITY OF DATA

The sensitive presale estimate of FMV plus any proprietary data used in the estimation of FMV must be properly safeguarded. Only those persons with a "need to know" shall have access to the sensitive or proprietary data. Prior

to a tract's bid being accepted:

1. The presale estimate of value shall not be discussed outside of the official BLM meetings and shall not be discussed over the phone.
2. Meetings or conversations where sensitive evaluation data are discussed shall be held or carried out in a secure area and in such a manner that non-BLM personnel and BLM personnel without a "need to know" are prohibited from having access to such data.
3. All sensitive and proprietary data shall be locked in a secure government approved filing cabinet or vault when the data are not actually required for analysis and discussion purposes.
4. All draft and final typed reports relating to FMV presale estimates shall be treated as confidential information.

V. REVIEW AND POST-APPRAISAL PROCESS

A. INTRODUCTION

The review and post-appraisal process includes appraisal-related activities that occur after the RET issues a completed appraisal report. These activities include an independent review of the presale appraisal, a post-sale analysis of bids, and a review of the post-sale analysis. Post-appraisal activities are summarized as follows:

1. Review of Presale Appraisal Report. The presale appraisal report is independently reviewed for technical content and conformance to appraisal guidelines.
2. Post-Sale Analysis of Bids. Evaluation criteria are applied to bids received for offered tracts. Additional market information may be derived from an analysis of bids. This information may be used in the evaluation of bids for which there was no competition.
3. Review of Post-Sale Analysis. Recommendation for bid acceptance or rejection is formalized in a post-sale appraisal report. The report is reviewed for technical content and conformance to accepted procedures.

B. REVIEW OF PRESALE APPRAISAL REPORT

Prior to the sale the presale appraisal report is submitted to the designated Deputy State Director for review by a qualified mineral review appraiser for conformance to this appraisal guidance. The purpose of the review is to ensure that the appraisal is consistent with this appraisal guidance and the estimation of value is soundly based and adequately supported. The approved report is signed by the qualified review appraiser and the designated Deputy State Director after completion of the review and after incorporation of any necessary revisions. This is completed prior to the sale.

1. Review of Appraisal Procedures

The appraisal is reviewed to ensure that it conforms to accepted appraisal procedures as delineated in this Manual and Handbook. The presale appraisal report should document the alternative approaches considered for the appraisal and the reasons for selecting a specific appraisal method. The reviewer will analyze the arguments presented and make an assessment of their validity. The assessment should consider the following arguments:

- a. Are input data shown to be selected on a fair and defensible basis?
- b. Are input data reasonable and accurate?

- c. Is the appraisal procedure appropriate for the available data?
- d. Will alternative methods yield a better estimate of value?
- e. Does the appraised value seem to be a sound estimate of actual market value?

2. Review of Supporting Documentation

The appraisal documentation will be reviewed to ensure that all conclusions are adequately supported. The reviewer will ensure that:

- a. Each substantive conclusion is supported by data or analysis.
- b. References to supporting data are adequately documented.
- c. Material included in the appendixes are relevant to the appraisal report and are sufficient to support its conclusions.

The reviewer will document the evaluation of supporting documentation. Insufficient documentation to support conclusions will be highlighted, and the report will be returned to the RET for completion.

3. Documenting the Presale Appraisal Report Review

The reviewer will attach a written memorandum to the presale appraisal report that indicates the scope of the review and supports the recommended actions prior to the sale.

C. POST-SALE ANALYSIS OF BIDS

The Department of the Interior is chartered with accepting or rejecting a sealed bid on a Federal coal lease tract. In evaluating the bids, the sale panel will screen all bids to determine if they qualify for further consideration. To qualify for further consideration, the bid must

satisfy all of the following criteria:

The bid meets or exceeds the minimum bid.

The bidder passes all the qualification requirements delineated in 43 CFR 3400.

There is no indication of collusion in the bidding of the coal lease tract(s).

Bids passing the screen are reviewed for recommendation to the authorized officer for acceptance or rejection.

1. Bid Acceptance Process

Prior to opening, the bids are divided into three categories: tracts with two or more bids, tracts with one bid, and tracts with no bids. Tracts with no bids are of no further consideration in this process. The review of the bids proceeds sequentially as described in the following sections.

a. Tracts With Two or More Bids

At least two countable bids must be received for the tract. A bid must meet or exceed 25 percent of the presale appraisal to be countable. Any bid less than 25 percent of the presale appraisal must be excluded from the count. If two or more bids equal or exceed 25 percent of the presale appraisal, the recommendation for acceptance of the

high bid on that tract is decided by the averaging rule. If only one countable bid is received for the tract, the bids are set aside for evaluation with one-bid tracts. If no countable bids are received, the bids also are set aside for evaluation with one-bid tracts.

The recommendation for acceptance of the high bid on a tract with two or more countable bids is decided by the averaging rule. The averaging rule adds the presale appraisal to the sum of the countable bids and divides by the number of countable bids plus one. This average is called the Average Evaluation of Tract (AEOT). A high bid equal to or greater than the AEOT is recommended for acceptance provided it is not less than 75 percent of the presale appraisal. A high bid less than the AEOT or less than 75 percent of the presale approved value is recommended for rejection.

Tracts whose high bids are recommended for acceptance by the AEOT rule will be examined to isolate those tracts that can be used as postsale comparables. Tracts used as post-sale comparables must satisfy the eligible and selectable criteria (see Chapter III section B.1.) for comparable tracts. If these criteria are satisfied, the tract is a candidate for use as a postsale comparable in evaluating remaining tracts.

b. Tracts With Only One Bid

Tracts receiving only one bid and tracts with two or more bids that have fewer than two countable bids are reviewed after the evaluation of the tracts with two or more countable bids has been completed. Tracts from the preceding evaluation accepted as candidate comparables for use in the post-sale analysis should be re-evaluated to see if they represent appropriate comparables for the tracts involved.

Tracts accepted as comparables will provide current competitive market data about lease values. Bids for tracts receiving only one bid or tracts with two or more bids that had fewer than two countable bids are recommended for acceptance or rejection as follows: tracts for which only presale comparables and presale appraisals apply are recommended for acceptance if the high bid exceeds the presale appraisal; tracts for which a reappraisal has been made on the basis of an additional comparable from the sale are recommended for acceptance if the high bid exceeds the reappraised value.

2. Post-Sale Appraisal Report

The RET will prepare a post-sale appraisal report to document the postsale appraisal analysis. The report will document all factors to be considered by the sale panel in the recommendation of bid acceptance or rejection. For example, if the presale appraisal is to form the basis for bid acceptance or rejection, the valuation procedure from which the presale appraisal was drawn should be included in the post-sale appraisal report. If a post-sale comparable was used to reappraise a tract, the criteria for selecting the comparable should be discussed and the new valuation explained as in the presale report. The report will be reviewed by a qualified review appraiser and designated Deputy State Director for conformance to the appraisal guidelines. A public version of the report will be prepared by deleting all proprietary material.

D. REVIEW OF POST-SALE ANALYSIS

The pre- and post-sale appraisal reports are submitted to the sale panel for evaluation. The sale panel will make a recommendation to accept or reject a qualified high bid on the basis of the post-sale appraisal report values. The sale panel will document its recommendations and submit them to the authorized officer for a decision. The sale panel will review the post-sale appraisal report as follows:

1. Review the procedures used in developing the post-sale appraisal report and the pre- and post-sale analyses that form the basis for bid acceptance or rejection.

- (a) If necessary, submit questions to cognizant individuals to clarify salient features of each analysis.

- (b) Identify discrepancies in the analysis that require resolution prior to the decision to accept or reject a bid.

(c) Request clarification of discrepancies identified in the review.

2. Request revision of the post-sale analysis only if one of the following conditions occur:

(a) A clear technical error that could and should have been detected prior to the sale is identified.

(b) The appraisal standards set forth in the guidelines were not met and the appraised value appears unreasonably derived, unsound, or inadequately explained.

3. After resolution of all outstanding issues, the sale panel will prepare a memorandum that documents the results and recommendations of the review of the postsale analysis.

E. CONFIDENTIALITY OF DATA

All post-sale appraisals and reports as well as all presale appraisals and reports, along with other proprietary data, must be treated as confidential and held secure during the post-sale bid evaluation process. When bid acceptance/rejection decisions have been reached by the authorized officer, the fair market value appraisals and estimates can be released to the public upon request on those tracts where the high bid has been accepted. Note in this regard, however, that release of FMV estimates before acceptance of a bid must not occur as provided in 43 CFR 2.20. Similarly, the information and analyses documents used to derive these released FMV estimates are to be released to the public upon request. The latter requests should be acknowledged and supplied (if specific and relevant) as higher priority work permits. The documents supplied should be modified to excluded proprietary information and to reflect 43 CFR 2.20 category D information's terms and conditions.

VI. ECONOMIC EVALUATION FOR EXCHANGES

A Federal coal fee property may be disposed of by exchange by the Secretary of the Interior under authorizing legislation contained in Section 206 of the FLPMA. In exercising the exchange, the Act requires that it must be in the public interest and the value of the lands accepted by the government must be of at least equal value to those given in exchange. Federal coal lease property exchanges are allowed only under legislation specific to each exchange. Usually the specific legislation authorizing lease exchanges also requires that the lands be of at least equal [market] value. Financial compensation may be provided to offset the differences in value so long as payment does not exceed 25 percent of the total value of the lands transferred out of Federal ownership. Exchanges are conducted under regulations CFR 2200, 3435, and 3436.

Federal coal lease and fee property exchange valuation is accomplished through a form of negotiation of appraised value between the affected parties. The negotiation strategy attempts to achieve realistic appraisals of property market value through information exchange between the government and the other party. From the government view, negotiation of information will promote a more equitable exchange because the objective is to provide better property information for the government's appraisal(s). The strategy of sharing of information and approach also helps to promote agreement by all parties to an appraised value.

The appraisal(s) may be carried out by the government, the applicant, by both, or by various contractors. Usually, the government evaluators (RET) consult with the applicant while conducting their own appraisal in order to have an BLM estimate of market value. The procedure for determining market value used by the evaluators (RET) should follow the economic evaluation procedures explained in this Handbook and Manual. There may also be an applicant appraisal which the government evaluators will also review. This review is based on the guidance in this Handbook and Manual and generally accepted appraisal practice. The government evaluators (RET) then advise the State Director on their opinion of the appraised value of the offered and selected lands.

An appraised value needs to be mutually agreed on by the government and the applicant based on the government evaluator (RET) recommendation and the appraisal(s). The exchange process within which the evaluation occurs should be generally as follows:

A. A coal lands exchange proposal is submitted to the District or State BLM office.

B. The proposed exchange is examined by the BLM State office to determine if it is in the public's interest to proceed with the exchange. The government evaluators comment on equal value concerns.

C. If it appears that acquisition of the non-Federal land could be in the public interest, the exchange processing can proceed or the BLM can make a counter proposal (for example, offer a different property in exchange).

D. If the BLM and the applicant determine that certain lands might be exchanged, the BLM should perform the following activities before proceeding with the exchange process:

(1) Examine alternatives to the proposed exchange.

(2) Develop an environmental assessment (EA) and, if necessary, and environmental impact statement (EIS) for the proposed exchange.

(3) Through the EA/EIS, land report, and public meeting, determine if the exchange is in the public interest, after due consideration of Department of Justice advice concerning antitrust consequences.

(4) Informally consult with the State government and other interests for their views concerning the proposed exchange.

(5) Complete a mineral report to determine if valuable coal deposits may exist on the lands.

E. If the BLM and the applicant agree to initiate an exchange process on land deemed valuable for coal, the BLM evaluators, the applicant's technical staff and or designated contractor(s) will collect and share the information and evaluation methods required to value the exchange properties coal rights and to prepare draft appraisals. For fee or lease exchanges, the applicant normally is responsible for providing geologic information.

F. The BLM evaluators and the BLM management representatives may then meet with the applicant and the respective contractors to review the draft appraisals and the available data and evaluation methods. The BLM evaluators will then usually prepare an appraisal using the best and most realistic data available which conforms to the guidance set forth in this Handbook. An applicant's preliminary evaluation or contractor(s) evaluations may form the basis for the draft evaluation provided it is checked for accuracy, lack of bias, completeness, and conformance to this evaluation guidance. If the applicant or their contractors also wish to make their own appraisal they may do this. The BLM evaluators should fully examine these other appraisals (based on this Manual and Handbook), document this examination in detail and make a recommendation on the appraised value of the properties.

G. The BLM evaluators and the BLM management may then discuss with the applicant the results of the appraisals. The applicant and the BLM may

provide comments and information on the appraisal(s), methods and data.

The BLM and the applicant may agree on a recommended appraisal, agree on a revised recommended appraisal or agree to separate appraisals. Hopefully, in most cases it is possible to agree to proceed only with a BLM appraisal so that multiple efforts are not undertaken.

H. The BLM evaluators perform final appraisal on the exchange tracts as now delineated if directed by the State Director. The final evaluation will include legitimate improvements to the data or methods which result from the discussion of preliminary results with the applicant. Adjustment to the delineation of exchange mineral lands may be made to achieve equal value. If an outside mineral appraisal is also to be done it is revised at this time.

I. The BLM evaluators final appraisal and any other appraisals are reviewed by the BLM evaluation staff and an

analysis and recommendation are made. BLM appraisals and other appraisals are also reviewed by the BLM qualified mineral appraisal reviewers.

J. The State Director and his staff examine the final BLM appraisal, other appraisals and the BLM evaluators recommendations. They determine whether the proposed exchange is in the public's interest and whether the government would receive at least equal value in exchange.

K. The State Director and the applicant discuss the exchange and the differing appraisals if any to determine whether the proposed exchange is satisfactory to both parties. If agreement cannot be reached, the specific exchange may be, as explained in the BLM regulation CFR Part 2200, abandoned, negotiated, or sent to voluntary arbitration within 180 days receipt of final value estimate(s). Note that there is no requirement that BLM agree to any exchange value which is not in its opinion truly equal value. If the exchange is mandated by law, a stalemate on value needs be delayed or settled in the courts.

L. Bargaining or arbitration to reach agreement on mineral rights value are to be directed at negotiating those values derived by what the BLM evaluators consider the best information and analysis available to them and the applicant. In no case shall BLM allow incomplete or technically flawed or unrealistic analyses and estimates provided by the applicant or its contractors to be used to reduce through negotiation what the BLM considers the best estimate.

M. If agreement on value can be reached, the final decision concerning the exchange is made by the State Director after public hearings and comment.

GLOSSARY OF TERMS

Average Evaluation of Tract (AEOT): a tract value based on an averaging of the government's presale estimate with two or more countable bids. A high bid equal to or greater than the AEOT is recommended for acceptance; otherwise, the high bid is recommended for rejection.

bonus bid: the dollar amount offered by a potential lessee as consideration for receiving a lease. Under existing regulations, the bonus bid must meet or exceed fair market value to be accepted by the Department of the Interior.

Bureau of Land Management (BLM): the nation's largest land manager. It administers lands in Federal ownership under multiple-use principles in the public interest. The BLM is responsible for issuing coal leases and conducting land use planning in the Federal coal management program.

bypass tract: A tract that contains Federal recoverable coal, which if not leased, would be bypassed in the reasonably foreseeable future. These reserves are generally small ones that would be isolated geologically and economically from other reserves.

captive tract: a Federal coal property of potentially much greater value to a single bidder because the bidder owns the adjacent mine or mineral lease rights (see bypass tract and maintenance tract).

coal tract: a defined area that forms a mining unit or a portion of a mining unit (see Tract Type 1, Tract Type 2, and Tract Type 3).

countable bid: a bid satisfying initial screening criteria that meets or exceeds 25 per cent of the Government's presale estimate.

Designated Deputy State Director: the Deputy State Director who reports to the State Director in charge of the RET located in either Santa Fe, New Mexico; Denver, Colorado; Cheyenne, Wyoming or Springfield, Virginia.

development right: a right to extract a mineral from a tract.

diligence: compliance with the term of a Federal coal lease requiring production in commercial amounts of recoverable coal reserves (one percent of the mining unit reserves) within a 10-year period beginning on the date of lease issuance.

emergency leasing: the leasing of Federal coal needed by an existing mine for one of the following reasons: (1) coal is needed within 3 years of the date of the lease application to maintain a mine at its current average annual level of production or to supply coal for contracts signed before July 19, 1979, or (2) without the emergency lease, Federal coal would be bypassed by mining. An emergency lease can be issued for no more than 8 years of recoverable coal reserves, and to be issued an emergency lease, a mine's need for the coal deposit must result from reasonably unforeseen circumstances.

Energy Minerals Activity Recommendation System (EMARS): the 1975 coal management program made up of three phases: (1) nomination and programming, (2) scheduling, and (3) leasing.

exchange: a trading of public lands (surface, subsurface, or both) for lands in other ownerships (see Fee Coal Exchange, Fee Mineral Exchange, and Fee Title Exchange).

Fair Market Value (FMV): that amount of cash or the equivalent for which the coal deposit would be sold or leased by a knowledgeable owner willing, but not obligated, to sell or lease to a knowledgeable purchaser who desires, but is not obligated, to buy or lease.

Federal Coal Leasing Amendments Act of 1976 (FCLAA): a law specifying rules to guide the Federal Coal Leasing Program.

Federal lands: lands owned by the United States, without reference to how the lands were acquired or which agency administers the lands, including mineral estate or coal estate underlying private surface, excluding lands held by the United States in trust for Indians, Aleuts, or Eskimos, and lands within the boundaries of Federal Indian Reservations.

Federal Lands Policy and Management Act (FLPMA): law specifying how public lands are to be managed.

fee coal exchange: a fee mineral exchange or fee title exchange involving coal.

fee mineral exchange: an exchange that involves only mineral rights.

fee title exchange: an exchange that involves the entire property, both surface and subsurface lands.

in situ coal: coal in its natural or original position.

lease: Federal coal lease is a right to mine issued under the coal leasing provisions of the mineral leasing laws that authorizes the exploration for and extraction of coal, only under an approved exploration or mining plan.

maintenance tract: a tract that lacks the recoverable reserves to support a new mining operation, on which recoverable reserves are large enough only to extend the life of an adjacent, existing mine or to permit expanding that mine's annual production.

Mineral Leasing Act of 1920 (MLA): the Federal law that establishes the procedures for the disposal of certain federally owned mineral deposits (including coal) on public domain lands of the United States.

Mineral Leasing Act for Acquired Lands: the Federal law that provides for the disposal of certain federally owned mineral deposits (including coal) on acquired lands of the United States under the procedures of the MLA.

mineral right: a right to ownership of a mineral reserve.

minimum bonus bid: the least amount that must be bid at a federal coal lease sale, as stated in the notice of sale, to qualify a bid for consideration; the minimum bonus bid is not necessarily fair market value.

Mining Unit (MU): an area of coal land that can be developed and mined in an efficient, economic, and orderly manner with due regard for the conservation of coal reserves and other resources.

Net Present Value (NPV): the value derived by reducing cost and revenue streams to a single number in which the difference between future revenues and costs are discounted to the present.

new mine tract: a coal tract that contains enough Federal recoverable coal of sufficiently high quality, either by itself or in combination with surrounding nonfederal recoverable coal, to justify spending money and the effort to develop and implement new mining operations.

public domain land: Land which has never left federal ownership. Mainly BLM managed.

recoverable coal reserves: the economically minable coal excluding all coal that will be left unmined, such as pillars, fenders, and property barriers.

Regional Coal Team: a body, consisting of BLM State Directors and State Governors or their representatives, that guides coal activity planning within a Federal coal production region and that makes leasing level and lease sale recommendations to the Secretary of the Interior.

Regional Evaluation Team (RET): a group of BLM professionals that performs economic appraisals within a region under the direction of the BLM Deputy State Director where the team is located.

royalty: the amount established in a lease that the lessee must pay the lessor as part of the consideration for the right to remove coal for sale or use. Under the FCLAA, royalty is expressed as a percent of the value of the coal. In older leases, royalty was expressed as a fixed amount per ton.

sale panel: a group appointed by the BLM State Director to review lease sale results and the fair market value analysis and prepare a report recommending acceptance or rejection of bids.

Tract Type 1: a single tract that constitutes a mining unit for a new mine operation. The tract contains sufficient reserves that can be developed and mined in an efficient, economic, and orderly manner with due regard for the conservation of coal resources and other resources.

Tract Type 2: a single tract that constitutes a portion of an MU for a new mine operation. The tract does not contain sufficient reserves to independently support a mining operation; however, the reserves can be used with other contiguous reserves to create an MU for a new mine operation.

Tract Type 3: a single tract that constitutes an increment to an existing mine operation. The tract does not contain sufficient reserves to independently support a mining operation; however, the reserves can be mined economically in conjunction with an existing mine operation.

BIBLIOGRAPHY

BOOKS

Appraisal Institute, *The Appraisal of Real Estate*, (10th Edition): Chicago, Illinois, 1992.

_____, The Appraisal of Rural Property: Chicago, Illinois,

1983.

_____, Reader's Guide to the Appraisal Journal, 1970-1980: Chicago, Illinois, 1981.

_____, Readings in the Appraisal of Special Purpose Properties: Chicago, Illinois, 1981.

Easton, J. D., Real Estate Valuation in Litigation: American Institute of Real Estate Appraisal, Chicago, Illinois, 1982.

Gentry, G. W. and O'Neal, T. J., Mine Investment Analysis: Society of Mining Engineers, New York, New York, 1984.

Harris, D. P., Mineral Resources Appraisal: Clarendon Press, Oxford, England, 1984.

Himstreet, W. C., Writing Appraisal Reports: American Institute of Real Estate Appraisal, Chicago, Illinois, 1974.

Interagency Land Acquisition Conference, Uniform Appraisal Standards for Federal Land Acquisitions: Washington, D.C., 1992.

Kolbe, A. L., and Read, J. A., Jr., The Cost of Capital Estimating the Rate of Return for Public Utilities: The MIT Press, Cambridge, Massachusetts, 1984.

Society of Mining Engineers, Surface Mining, New York, New York

, Coal Preparation, New York, New York

, Mine Engineering Analysis, New York, New York

, Risk Assessment/Management, Issues in the Environmental Planning of Mines, New York, New York

Stermole, F. J., Economic Evaluation and Investment Decision Methods: Investment Evaluations Corporation, Golden, Colorado, 1993.

MINING HANDBOOKS

Caterpillar Tractor Co., Caterpillar Performance Handbook: Caterpillar Tractor Company, Peoria, Illinois

Machine performance data. Includes tables and curves showing cycle times or hourly production figures for machines under various operating conditions. Presents methods for estimating machine owning and operating expenses.

Church, Horace K., 1981. Excavation Handbook: McGraw-Hill Book Company, New York, New York.

Discusses principles, procedures, equipment, and costs for open-cut mining excavation and handling. Provides information on costs of owning and operating equipment and facilities.

Hartman Howard L., ed., 1992, SME Mining Engineering Handbook, Volumes I and II: Port City Press, Baltimore, Maryland.

Provides planning, mine practices, and mine engineering information. Volume I discusses exploration and underground mining. Volume II provides information on surface mining and mine costing.

SOURCES OF COAL MARKET, PRODUCTION, AND PRICE TREND DATA

EIA Databases

Quarterly Coal Consumption Report-Manufacturing Plants

Data concerning coal receipts, stocks, prices, and consumption for manufacturing plants other than coke plants. Data include types, quantities, and costs of coal received by contract and spot purchases.

Coke Plant Report

Data include production, transfers, consumption, sales, and stocks of coal and coke from operating coke plants.

Coal Distribution Report

Provides coal distribution data. Data include origin of coal produced and purchased, distribution by mode of transportation and consumer category, sales to other coal distributors, and end-of-quarter stocks.

Coal Production Report

Provides information on current and prospective coal production, transportation, conversion, and utilization. Data include company identification; types of mining operation; recoverable reserves; production quantity and value by distribution, stocks, and productive capacity; employment; and projected production.

Monthly Powerplant Report

Provides net generation, fuel consumption, and end-of-month fuel stocks for all electric generating plants.

Annual Projection of System Changes

Provides data on planned generating units, peak load forecasts, and energy forecasts.

Coordinated Regional Bulk Power Supply Program Report

Provides information concerning the regional planning of electric utilities for a 15-year advance period.

Monthly Report of Cost and Quality of Fuels for Electric Plants

Provides data on plant type, type and source of fuel, quantity of fuel received, quality of fuel, and fuel cost.

Other Sources

Coal Network Associates, Inc, Coal Supply Contracts and Power Plant Consumption. Fort Collins, Colorado.

Provides information on coal supply contracts and utility consumption. Data include receiving utility plant and location; existing and projected generation plant capacity; projected coal requirements; power plant consumption; contract and total deliveries by power plants; delivered coal quality by power plant; delivered contract prices; supplier company, mine, and location; contract coal quality; annual contracted quantity; and contract start and end date.

National Coal Association. Steam Electric Market Analysis, Washington, D.C.

Monthly compilation of coal consumption, stockpiles, and percent generation by type fuel for major coal burning

power plants.

National Coal Association, Power Plant Coal Deliveries, Washington, D.C.

Monthly report of coal deliveries to all utilities making coal purchases. Data include purchase price, quality, quantity, type of contract, and source.

National Coal Association, International Coal, Washington, D.C.

Provides data on coal supply and demand, imports and exports, average values, and coal freight rates for major coal producing and consuming nations.

National Coal Association, Coal Data, Washington, D.C.

Provides data on coal production, consumption, stocks, distribution, and leased coal reserves.

National Coal Association, Weekly Statistical Summary, Washington, D.C.

Provides information on weekly coal production and consumption, electrical output, steel production, and steam coal prices.

SOURCES OF TRANSPORTATION DATA

Association of American Railroads, Railroad Coal Statistics, Washington, D.C.

Provides information on coal shipments by rail. Also, provides some data on railroad coal transportation rates.

Fieldston, Inc. Coal Transportation Report, Washington, D.C.

Publishes biweekly information on rail and barge transportation rates. Rail/Route guide provides data on transportation water and routings to selected markets and the coal purchasing pattern in each market.

Interstate Commerce Commission, Washington, D.C.

Compiles statistics on coal contract rates.

The Journal of Commerce, Port Import/Export Reporting Service, New York, New York.

Provides export information on mineral commodities. The computerized system contains product data, name and location of U.S. consignee/exporter, country of origin or destination, quantities, weights, and other data.

National Coal Association, Coal Traffic. Washington, D.C.

Provides recent information on coal transportation by rail track, inland waterways, and Great Lakes. Includes data on equipment, tonnages, and revenue received by coal-carrying railroads. Also, includes coal contract summaries between shippers and railroads, and detailed rail rates for U.S. exports from mine to port of exit.

SOURCES OF CAPITAL AND OPERATING COST DATA

Robert Snow Means Co, Building Construction Cost Data, Kingston, Massachusetts.

Provides average unit prices for building construction items. Includes information on hourly and daily wage rates for construction workers.

Dataquest, Inc. Green Guide. San Jose, California.

Contains original, current, and resale values for all major classes of construction equipment including earthmovers, haulage units, and excavators. Also provides equipment specifications.

Dataquest, Inc. Cost Reference Guide. San Jose, California.

Provides detailed ownership and operating costs for major construction equipment including earthmovers, haulage units, excavators, and drills. Data include hourly ownership and overhaul expenses, including depreciation, overhead, parts and labor; field repair and expenses, including parts, labor, fuel or electricity, lubrication, and tires; and economic life of equipment.

Bureau of Labor Statistics. Producer Price Indexes. Washington, D.C.

Monthly information on average changes in mining equipment prices.

United Mine Workers of America. Wage Contract. Washington, D.C.

Provides information on hourly wage rates by job classification for surface and underground miners and support personnel.

Local Utilities

Provides local monthly power and energy rate schedules. Also, provides information on the cost of bringing power distribution to the site.

Equipment Manufacturers

Provides equipment costs and specifications, including delivery and set-up charges.

SOURCES OF GEOLOGIC DATA

State Geological Survey

Provides stratigraphic sections, geologic descriptions, hydrologic studies, lithologic logs, and surface geology and structure information.

U.S. Geological Survey

Provides geological maps, plats, land descriptions, and hydrologic information.

State Bureau of Mines and Mineral Resources

Provides resource and hydrologic data.