

**TITLE 110
WEST VIRGINIA LEGISLATIVE RULES
STATE TAX COMMISSION**

**SERIES 11
VALUATION OF ACTIVE AND RESERVE COAL PROPERTY FOR
AD VALOREM PROPERTY TAX PURPOSES**

§ 110-11-1. General.

1.1 **Scope.** -- This rule clarifies and implements State law as it relates to the appraisal at market value of active and reserve coal properties.

1.2 **Authority.** -- W. Va. Code §§ 11-1A-11 and 11-1C-5(b).

1.3 **Filing Date.** --

1.4 **Effective Date.** --

1.5 **Repeal of Former Rule.** -- This legislative rule repeals and replaces W. Va. 110 C.S.R. 11 "Valuation of Active and Reserve Coal Property for Ad Valorem Property Tax Purposes" filed July 26, 1991 and effective July 26, 1991.

§ 110-11-2. Introduction.

2.1 Coal is one of the several estates in real property which may be owned either separately or in conjunction with other estates. If coal is owned as a separate estate, either absolute, as a leasehold, or in conjunction with other estates, West Virginia property tax law requires ownership to be listed, valued and taxed. Coal may be owned without being mined. Coal title may exist where no coal is actually present (barren), or where the coal is unmineable or mined-out. For valuation purposes this rule classifies coal property into the following categories: **Active; Reserve; Unmineable; Mined-out; and Barren**

2.2 This rule proposes a newly-developed appraisal process for reserves and much of the data used to estimate appraised value shall be new. The Tax Commissioner shall therefore provide notices of comparative appraised values to owners of coal property in advance of the July 1, 1999 assessment date. This advanced notice, which shall be based upon July 1, 1997 information, is intended to ensure that the newly-developed data is as accurate as possible for individual parcels and accounts representing coal ownership.

§ 110-11-3. Definitions.

As used in this rule, and unless the context clearly requires a different meaning, the following terms have the meaning ascribed in this section:

3.1 "**Active acre**" means mineable acreage of a bed of coal on an active mining property that will be extracted within the maximum "life of mining" on the property.

3.2 "**Active mining property**" means a mineable bed of coal on a parcel or portion of a parcel of land involved in a mining operation. Each and every bed of coal being mined in a permitted mining operation is a separate active mining property.

3.3 "**Adjusted property value**" means the sum of the adjusted individual coal bed values.

3.4 "**Adjusted individual coal bed value**" means the individual coal bed index for each coal bed on each property, multiplied by the aggregate ratio.

3.5 "**Aggregate value**" means the total value of in-place mineable coal in the State.

3.6 "**Aggregate active value**" means the total value of active acres on an active mining property in the State on the November 15th next succeeding the July 1st assessment date.

3.7 "**Aggregate ratio**" means aggregate reserve value divided by the aggregate reserve index.

3.8 "**Aggregate reserve value**" means the aggregate value less the aggregate active value.

3.9 "**Aggregate reserve index**" means the sum of products of the individual property calculations as determined by the reserve coal valuation model (RCVM).

3.10 "**Annual acres mined**" means the annual production (as defined in this Section 3) divided by the product of the average thickness in feet of the coal bed being mined (as detailed in annual mining reports), multiplied by eighteen hundred (1800) tons per acre-foot coal density, multiplied by the clean coal recovery rate (either run-of-mine or washed). Appendix A, Formula 1, of this rule is the formula used for calculating annual acres mined.

3.11 "**Annual production**" means the production of coal from mining operations as reported by coal bed and by mine.

3.11.1 Annual production, for active mining valuation purposes, means the arithmetic mean of the annual rate of coal production of three (3) years' production for the

three most recent calendar years preceding the July 1st assessment date. If production during any of the three (3) years occurred during a period of less than eleven (11) months, the production shall be annualized before an annual production is calculated.

3.11.2 Annual production, for purposes of determining the aggregate value, means the arithmetic mean of the last three calendar years of the total tons of coal mined in West Virginia, as reported to the Office of Miner's Health, Safety, and Training, adjusted for coal actually mined from other states but produced through portals located in West Virginia.

3.12 "**Average coal price**" for purposes of the reserve coal valuation model, means the arithmetic mean of the sum of the last three calendar years of total FOB-source (point of sale, no transportation) values of steam coal mined in West Virginia and sold on the spot market as reported on FERC Form 423 to the United States Department of Energy (USDOE) and to the West Virginia Public Service Commission (WVPSC), divided by annual production, expressed in dollars/ton. Average coal price can also be expressed in dollars per million BTU and is determined by dividing the arithmetic mean of the sum of coal sales, by the sum of all steam coal BTU mined in West Virginia and sold on the "spot" market as reported on FERC Form 423 to the United States Department Of Energy and to the West Virginia Public Service Commission for the three most recent calendar years preceding the July 1st assessment date, calculated for the entire state as well as by coal bed and by location.

3.13 "**Average royalty rate**" means the arithmetic mean of blended underground and surface coal royalty rates, for leases that have occurred within at least the five (5) calendar years immediately preceding the July 1st assessment date.

3.14 "**Barren**" means fee/mineral/coal properties where the coal rights are owned but the coal was never deposited and/or has been subsequently removed by erosion.

3.15 "**Base market location value**" means the coal price per million BTU by coal bed by location, multiplied by the royalty rate by coal bed by location.

3.16 "**BTU content**" means number of British thermal units (BTU) in one pound of dry coal.

3.17 "**BTU adjustment factor**" means the penalties or bonuses on price related to the BTU content versus market price interaction.

3.18 "**Capitalization rate**" means the rate used to convert an estimate of income into an estimate of market value. The method for calculating the capitalization rate is set forth in Subsection 4.1 of this rule.

3.19 "**Clean coal recovery rate**" means:

3.19.1 for active mining purposes, a decimal representing the percentage of marketable coal that is recovered, whether the coal is classified as run-of-mine-clean or washed-clean. The clean coal recovery rate must reflect the difference between calculated whole bed tonnage (tons-in-place) and mined tonnage as reported to the Office of Miner's Health, Safety and Training; and

3.19.2 for reserve coal valuation purposes, a decimal representing an estimate of clean coal that may be recovered based on estimated tons-in-place, estimated mine recoveries and estimated wash recoveries based on area and coal bed information derived from taxpayer returns, other taxpayer-supplied information, publicly-available information, and other information that comes to the attention of the Commissioner.

3.20 "**Coal bed**" means all the coal and associated rock partings, if any, lying between logical and/or practical roof and floor strata.

3.21 "**Coal bed index factor**" is the sum of all reserve coal bed valuation factors, divided by three and rounded to the nearest value of 20, 40, or 80.

3.22 "**Coal in-place price**" means the price per million BTU of estimated clean and marketable coal, before mining. Coal in-place price equals coal price multiplied by the average royalty rate.

3.23 "**Coal Price**" means the FOB-source (point of sale, no transportation) price per million BTU of clean, marketable coal.

3.24 "**Coal property transfer**" means the transfer of coal rights on properties by sale or lease.

3.25 "**Commissioner**" or "**Tax Commissioner**" means the Tax Commissioner for the State of West Virginia, or his or her delegate.

3.26 "**Discount component**" means a rate reflecting a provision for returning to an investor a sum of money equal to the aggregate of the anticipated return-on-investment over the economic life of an investment.

3.27 "**Environmental factor**" means an index that reflects the environmental impediments to mining, such as wild and scenic rivers, severe acid mine drainage problems, and areas designated unsuitable for mining as identified by the Division of Environmental Protection.

3.28 "**GIS**" means a geographical information system, which, for purposes of this rule, is a computerized system to map and manage coal-related data.

3.29 "**Individual coal bed index**" means the preliminary derived value for a specific coal bed on a property before adjustment using the aggregate ratio.

3.30 "**Life of mining (mine life)**" means the number of years required to exhaust a coal bed.

3.30.1 In the case of appraisal of active mining property, life of mining means the number of years required to exhaust the coal bed at the annual production rate, to a maximum of fifteen (15) years for underground mines and five (5) years for surface mines. Fractional years are rounded to the nearest whole number.

3.30.2 In the case of appraisal of reserves, for the calculation of aggregate value, life of mining means the number of years required to exhaust the total known reserves of coal in West Virginia.

3.31 "**Management rate**" means a rate reflecting a return to an investor for the management of similar investment portfolios.

3.32 "**Market interest factor**" means an index that indicates the relative coal market activity in a specified area.

3.33 "**Market mineability factor**" means an index that indicates the relative cost of mining in a specified area.

3.34 "**Metallurgical coal**" means bituminous coal that is suitable for making coke by industries that refine, smelt, and work with iron and/or steel.

3.35 "**Mineable coal bed**" means coal which is situated so that it may be mined using generally accepted mining practices and suitable equipment. Coal beds which are of a thickness of less than thirty inches (30") shall not be classified as mineable coal unless there is evidence to the contrary.

3.36 "**Mined-out coal bed**" means a bed of coal, or any portion of the bed, which has been depleted by prior mining operations and from which no additional coal is recoverable by generally accepted mining practices and suitable equipment, unless there is evidence to the contrary.

3.37 "**Mining operation**" means an enterprise permitted by the West Virginia Office of Miner's Health Safety and Training/Office of Mining and Reclamation to engage in actively obtaining or preparing to obtain coal or its by-products from the earth's crust, including underground, surface and/or auger mines. Each mining operation may have more than one (1) area designated as "Active mining property."

3.38 "**Multiplier**" means the "Present Worth of One (1) Per Period" for the life of the mining operation employing the capitalization rate determined in Subsection 4.1. of this rule, through application of a standard mid-year life calculation.

3.39 "**Nonliquidity rate**" means a rate reflecting a return to an investor representing the loss of interest on an investment arising from the time required to sell the investment.

3.40 "**Operator**" means an individual, partnership or corporation that is engaged in actively obtaining or preparing to obtain coal and/or its by-products from the earth's crust on an active mining property.

3.41 "**Present value per acre**" means the present value per acre of a coal bed on a reserve property.

3.42 "**Prime coal bed**" means the thickest, previously mined, stratigraphically-highest coal bed in an area, with sufficient mineable tons to sustain mining for two (2) years in a specified area at the average rate of mining in the bed, in the general area, for the most recent three (3) calendar years.

3.43 "**Prime coal bed factor**" means an index that indicates the relative profitability of a set of coal beds in a specified area.

3.44 "**Property tax component**" means a rate reflecting a provision for returning to an investor a sum of money equal to property taxes paid over the economic life of an investment.

3.45 "**Recapture component**" means a rate reflecting a provision for returning to an investor a sum of money equal to his or her investment.

3.46 "**Reserves**" means those beds of coal, or portions of the beds, which contain mineable coal, but are not active acres on an active mining property.

3.47 "**Reserve coal property**" means any property for which coal rights are part of the owned estate and which is not part of an active mining property.

3.48 "**Reserve coal valuation model**" is a computerized valuation method applied in a mass appraisal environment to estimate value of reserve coal property for ad valorem property tax purposes.

3.49 "**Risk rate**" means a rate reflecting a return to an investor necessary to attract capital to an investment containing a possible loss of principal and/or interest.

3.50 "**Safe rate**" means a rate reflecting a return to an investor on an investment which has little, if any, likelihood of loss of principal or of loss in anticipated return on investment.

3.51 "**Steam coal**" means bituminous coal that is mineable but that is not suitable for coking by industries that refine, smelt, and work with iron and/or steel.

3.52 "**Sulfur adjustment factor**" means the penalties or bonuses on price related to the Sulfur content versus market price interaction.

3.53 "**Sulfur content**" means a decimal representing the percent of sulfur in dry coal.

3.54 "**Summation discount component**" means a discount rate expressed as the aggregate of a safe rate, risk rate, nonliquidity rate, and management rate, adjusted for inflation.

3.55 "**Thickness**" means the measurement of all coal, including any thinner coals (splits) and also rock partings seen above or below the main block of coal, that comprises part of what is generally understood to be a logical mining unit. Methods of determining thickness for valuation are described in Subsection 4.1 and Subsection 4.2.

3.56 "**Unmineable coal bed**" means coal which is not in a mineable coal bed.

3.57 "**Volatility content**" means a decimal representing the percentage of volatile matter in dry coal.

3.58 "**Volatility factor**" means a factor that identifies coal with a volatility content sufficiently low to render it unsuitable for steam coal markets.

3.59 "**1800 tons per acre foot**" means the weight, in tons, of a relatively clean coal bed one (1) foot in thickness (Thk) and covering one (1) acre, that has an assumed specific gravity of 1.32. The formula for calculating "1800 tons per acre foot" is set forth in Appendix A, Formula 2 of this rule.

§ 110-11-4. Valuation methods.

4.1 Valuation of active mining property.

4.1.1 **General.** -- The value of active mining property is the sum of the value of active acres and reserves that are included in the active mining property. In no case shall the value per active acre on a coal bed be less than the applicable present value per acre on the coal bed. Unmineable, mined-out and barren acres will not be valued on active mining property.

4.1.2 **Determination of active mining property.** -- The designation of Active mining property areas shall be determined as follows:

4.1.2.a An operator may designate or assign a portion of a parcel to an active mining property when only that portion is suitable for the particular mining purposes. For purposes of determining the actual area of the active mining property, all contiguous parcels or portions of parcels containing the mineable coal beds that are under lease, regardless of ownership, that fall within the mining portion, shall be included. Parcels not leased or owned (adverse), that fall within the mining portion of active mining property shall have the requisite mineable beds of coal valued as reserves;

4.1.2.b Any mining operation producing coal from one coal bed shall be designated as an active mining property. If the mining operation is producing coal from multiple coal beds under a single permit, then each coal bed shall be designated as a separate Active mining property;

4.1.2.c Any mining operation producing coal from one (1) coal bed at different portals and/or high-walls under one (1) specific permit, shall be designated as one (1) Active mining property. If the production of coal involves different mining techniques (e.g. surface/auger or underground mining method), or if mining sites are separate and generally independent, then each site shall be designated as a separate Active mining property;

4.1.2.d If more than one permitted mining operation is mining a given coal bed on the same land or mineral parcel, then each mining operation is a separate Active mining property. Under no circumstances shall the sum of the active acres for all mining operations on each bed exceed the total parcel acres. As necessary, the Commissioner shall apportion the number of acres for each mining operation, based upon a review of relevant taxpayer and/or operator information and leases, and the respective rates of average annual production;

4.1.2.e If the permitted mining operation has not begun production by the July 1 assessment date, the mineable coal shall be reported on the Annual Appraisal Report for Production of Coal and valued as reserves. Once a parcel or portions of a parcel have been assigned or designated to an Active mining property, it shall continue to be listed on an Annual Appraisal Report until such time as the permit has been retired;

4.1.2.f If the mine ceases production before the July 1st assessment date, and there is mineable coal remaining in the coal bed, the remainder shall be valued as reserves for the current tax year; and

4.1.2.g The maximum active mining portion for each coal bed shall be fifteen (15) years for underground mines and five (5) years for surface mines multiplied by the annual acres mined. If the available mineable acreage of the coal bed being mined is less than the maximum amounts listed above, then the total available acreage shall be considered for designation as the active mining portion.

4.1.3 Determination of annual production. -- Annual production shall be determined as follows:

4.1.3.a An arithmetic mean shall be taken of tonnage as reported by producers and verified by the Commissioner through research of West Virginia Office of Miner's Health, Safety, and Training records and/or audit-derived information, for the three most recent calendar years preceding the July 1 assessment date; and

4.1.3.b If production has not occurred in either the second or third most recent years, the arithmetic mean of the available one or two years production shall be used.

4.1.4 Value per active acre. -- In the application of the valuation formula to an Active mining property, the appropriate calculation shall be based upon the actual market to which the coal from the bed is currently being sold, whether it is metallurgical and/or steam. The factors to be used for the valuation formula are: the coal thickness in feet (Thk), 1800 tons per acre foot (1800), the clean coal recovery rate (RR), the Steam Coal royalty rate, underground or surface (SRoy), the Steam Coal Market (SCM), a net present value multiplier (M) and the mine life in years (ML); and the coal thickness in feet (Thk), 1800 tons per acre foot (1800), the clean coal recovery rate (RR) the Metallurgical Coal royalty rate, underground or surface (MRoy), the Metallurgical Coal Market (MCM), a net present value multiplier (M), and the mine life in years (ML). The formula used to determine the value per active acre (\$/ac) is found at Appendix A, Formula 3 of this rule.

4.1.5 Thickness (ft.) -- Thickness shall be determined as follows:

4.1.5.a An arithmetic mean shall be taken of thickness as reported by producers and verified by the Commissioner through review of audit-derived information, for the three most recent calendar years preceding the July 1st assessment date.

4.1.5.b If production has not occurred in either the second or third most recent years, the arithmetic mean of the available one or two years thickness shall be used.

4.1.6 **Royalty rate.** – The royalty rates to be used in Formula 3 (Appendix A), shall be determined for each of the following four (4) different types of coal mining operations.

4.1.6.1 Underground mines, steam coal;

4.1.6.2 Underground mines, metallurgical coal;

4.1.6.3 Surface and/or auger mines, steam coal; and

4.1.6.4 Surface and/or auger mines, metallurgical coal.

These royalty rates shall be established annually by the Tax Commissioner after a review of both recorded and unrecorded, willing seller-willing buyer coal property leases that have occurred in the State of West Virginia and appropriate portions of adjacent states during at least the last five (5) years prior to the July 1 assessment date, and through inspection of any other appropriate information. The Tax Commissioner shall maintain a data base on royalty rates and file a preliminary summary of results in the State Register on or before July 1 of each year; shall accept written public comment on the results until August 1 of each year; and shall issue the final royalty rates on or before September 1 of each year. From this survey, the Tax Commissioner shall select the royalty rates that best typify the coal property leases. In order to convert decimal royalty rates into specific dollars per ton rates, the Tax Commissioner shall separately conduct a review of West Virginia coal selling prices, and select specific selling price rates based on prices best typifying activity in each appraisal year. The selected selling prices per ton when multiplied by the decimal royalty shall result in the specific dollar per ton royalty.

4.1.7 **Determination of capitalization rate.** -- For use in determining the net present value multiplier (M) used in Formula 3, prescribed in this Section 4, a single statewide capitalization rate for coal shall be determined annually by the Tax Commissioner through the use of generally accepted methods of determining those rates. The rate shall be based on the assumption of a level, non-inflating income series. The capitalization rate used to value coal shall be developed considering (1) a discount rate

determined by the summation technique, (2) a recapture component, and (3) a property tax rate.

The Commissioner shall conduct a study to develop components for determining the capitalization rate annually and the preliminary results shall be filed in the State Register on or before July 1st of each year. Public comment on the study shall be accepted until August 1st of each year, and final results to be used shall be issued on or before September 1st of each year.

4.1.7.1 Determination of discount component. -- The summation technique shall be used in developing a discount component of the capitalization rate. The Commissioner shall determine the sum of the safe rate, the nonliquidity rate, the risk rate, and the management rate, and subtract the inflation rate from the sum. The five subcomponents of the discount component are as follows:

4.1.7.1.a Safe Rate. -- The safe rate shall reflect a rate of return that an investor could expect on an investment of minimal risk. It shall be developed by averaging interest rates offered on thirteen-week United States Treasury Bills for a period of three (3) calendar years prior to the appraisal date.

4.1.7.1.b Nonliquidity rate. -- The nonliquidity rate shall be developed through an annual study to determine a reasonable estimate of time that coal property, when exposed to the market for sale, remains on the market until being sold. The time thus determined shall be used to identify United States Treasury Bills with similar time differentials in excess of thirteen-week Treasury Bills. The interest differential between these securities shall be used to represent the nonliquidity rate. For example, if it is determined that a coal property remains on the market for an average of nine months (39 weeks) before being sold, the nonliquidity rate shall be derived by taking the rate on one year Treasury Bills minus the rate on thirteen-week Treasury Bills.

4.1.7.1.c Risk rate. -- The relative degree of risk of an investment in coal property is difficult to determine from published interest rates. Interest rates required on loans for acquisition and/or development of coal properties shall be calculated by adding two percent (2%) to the Prime Rate Charged By Banks as published in the Economic Indicators Prepared By The Council Of Economic Advisors For The Joint Economic Committee for each of the three calendar years prior to the July 1 assessment date. The Three year average shall be compared to interest rates offered on thirteen-week United States Treasury Bills for the same three year period. The difference between the two combined with bands of investment analysis shall be used as a basis to estimate the risk rate.

4.1.7.1.d **Management rate.** -- The management rate represents the cost of managing the investment, not the cost of managing the coal property. Because the management rate has historically been one-half of one percent (0.5%) of the value of investment portfolios, for purposes of determining the discount component the management rate shall be one-half of one percent (0.5%).

4.1.7.1.e **Inflation rate (negative).** -- Nominal interest rates, including the "safe rate" mentioned above, are higher than real rates by an amount representing expectation of future inflation. However, net annual income from coal property is to be estimated assuming level future royalties (no inflation). Therefore, the capitalization rate must be a real rate, net of expectation of inflation. The inflation rate will be estimated through analysis of the most recent three calendar years of an appropriate United States Department of Labor, Bureau of Labor Statistics price index, as determined by the Tax Commissioner. Beginning in Tax Year 2003, the inflation rate shall be estimated through analysis of the most recent three calendar years of an appropriate United States Department of Labor, Bureau of Labor Statistics price index, as determined by the Tax Commissioner.

4.1.7.2 **Recapture component.** -- Selection of a multiplier will be accomplished through access of a standard mid-year Life Inwood table. The Inwood table has a recapture built into the table coefficients. Inclusion of a recapture component in the capitalization rate is therefore not appropriate.

4.1.7.3 **Determination of property tax component.** -- This component shall be derived by multiplying the assessment rate by the statewide average of tax rates on Class III property. At the present time, research indicates that royalty rates do not include property taxes as a component; rather, property taxes are paid by the producer as additional compensation. Thus, this component shall not be used in the capitalization rate as defined in this rule unless the general practice of the coal industry changes.

4.1.8 **Determination of value of active mining portion.** -- The valuation of the active mining portion (VAMP) shall be determined by multiplying the annual acres mined (AAM), by the mine life (ML), by the valuation rate of the active acre (\$/ac). The formula used to determine the value of the active mining portion is found at Appendix A, Formula 4 of this rule.

4.2 Valuation of reserves.

4.2.1 **General.** -- It is recognized that the Mineral Lands Mapping Program currently in progress as a combined effort of W. Va. Department of Tax and Revenue, W. Va. University Department of Geology and Geography, W. Va. Geological and Economic

Survey, and the Office of W. Va. State GIS Coordinator will in the future provide very detailed location and coal bed information for use in appraising reserve coal property in West Virginia. In the interim, reserve coal shall be valued according to a phased-in combination of a reserve coal valuation model (RCVM) and a transitional coal valuation model (TCVM) to minimize economic impact of the expected changes in valuation. Only data that has been received or otherwise made available and has been entered into the computer system by November 15th next succeeding the July 1st assessment date shall be utilized for purposes of the RCVM and TCVM valuation procedures.

4.2.1.a. For Tax Year 2000, the reserve appraisal shall be a combination of 20% RCVM value and 80% TCVM value. For Tax Year 2001, the reserve appraisal shall be a combination of 40% RCVM value and 60% TCVM value. For Tax Year 2002, the reserve appraisal shall be a combination of 60% RCVM value and 40% TCVM value. For Tax Year 2003, the reserve appraisal shall be 80%RCVM value and 20% TCVM value. For Tax Year 2004 and subsequent tax years, the reserve appraisal shall be 100% RCVM value.

4.2.1.b. The minimum valuation placed on reserves may never be less than a rate of \$5.00 per acre.

4.2.1.c. Any unmineable, mined-out or barren coal shall be valued as part of the reserve coal property and according to the methods described in this section.

4.2.2 **Determination of reserves.** -- The determination of reserve coal beds and quantities on any reserve coal property may be made by use of: taxpayer-supplied information, publicly-available information, audit-derived information, and Geographical Information System (GIS)-derived information.

4.2.3 **Reserve coal valuation model.** – In order to derive the RCVM portion of the value of reserves in this State. The following procedures shall be used.

4.2.3.1 **Data collection and maintenance procedures** -- The Tax Commissioner shall maintain a Geographic Information System (GIS) which includes the following data sets:

4.2.3.1.a **Coal Bed Maps:** Coal data including indications of the areal extent, mineable extent, thickness and various quality parameters for each identified coal bed

4.2.3.1.b **Mine Maps:** Coal Mine operation data indicating the location and other pertinent data of all reporting coal mines currently operating and as many closed mines as possible

4.2.3.1.c **Prices:** Coal sales information indicating the source location (coal mine), destination (buyer), transportation, and FOB-source price of coal sold from mines in West Virginia

4.2.3.1.d **Transactions:** Coal property transaction information indicating the terms and locations of leases and sales of coal properties

4.2.3.1.e **Royalties:** Coal royalty information indicating the location and terms of coal royalty agreements

4.2.3.1.f **Environmental Conflicts:** Information indicating the general location of potential environmental problems which could impede permitting mining

4.2.3.1.g **Use Conflicts:** Data reflecting oil or gas well location or density, which may affect the cost of mining

4.2.3.1.h **Reserve Coal Property Location:** Information indicating the general location of each individual taxable reserve coal property

4.2.3.1.i **Production:** Data reflecting coal produced annually by mine and by coal bed

4.2.3.1.j **Capitalization rate:** Market data necessary to develop a capitalization rate estimate

4.2.3.1.k **Current Active Mine Data:** Active mine data from the Natural Resources Appraisal System.

These data sets shall be used to create maps and tabular data for the determination of reserve coal property value. The data sets and maps shall be managed as specified in Subdivisions 4.2.3.2 through 4.2.3.16 of this rule:

4.2.3.2 **Coal bed maps** -- The Tax Commissioner, together with the West Virginia Geological and Economic Survey, shall develop and maintain a Geographic Information System (GIS) comprised of maps and data files of all reserves in the State of West Virginia providing information concerning:

- Coal bed name
- Thickness
- BTU content

- Volatility
- Sulfur

The information shall be obtained from the following sources:

West Virginia Division of Environmental Protection
West Virginia Geological and Economic Survey
United States Geological Survey
United States Energy Information Administration
West Virginia Public Service commission
Academic institutions
Any other sources that come to the attention of the Tax Commission

The maps and data files created shall be updated at least every second year. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.3 Mine maps -- The Tax Commissioner, together with the W. Va. Geological and Economic Survey shall maintain data files compatible with the Geographic Information System (GIS) which describe the location, size, and ownership of all reporting coal mines (historic and current) in the State of West Virginia, as available. These files shall include but are not limited to the following:

- Mine location
- Mine name and permit number
- Operator name
- Annual tons mined
- coal beds mined
- Thickness
- Coal quality (BTU, Ash, Sulfur, Volatility, Moisture)
- Royalty rates
- Coal sales (prices, destination, quantity and quality)

The information shall be obtained from but not limited to the following sources:

West Virginia Division of Environmental Protection
Office of Miner's Health, Safety, and Training
US Energy Information Administration

West Virginia Public Service Commission
Any other sources as may come to the attention of the Tax Commission

The maps and data files created shall be updated annually. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.4 Prices -- The Tax Commissioner shall maintain data files compatible with the Geographic Information System (GIS) which document the FOB-source price of coal sales throughout the State. These files shall be used to create price maps. These files shall include but are not limited to records and estimates of:

- Coal source: mine location, mine name
- Tons shipped per sale
- Coal bed(s) mined, if listed
- Coal quality: sulfur, BTU, ash, moisture
- Transport mode
- Transport cost, if available
- Prices paid: delivered and FOB-source
- Destination

The information shall be obtained from but not limited to the following sources:

US Energy Information Administration
West Virginia Public Service Commission
Any other sources as may come to the attention of the Tax Commission

The Commissioner shall use this data to create an overall FOB-source price trend map and for individual coal beds, for the state of West Virginia. The data shall also be used to determine overall sulfur and BTU adjustment factors by an annual survey of the market to determine price adjustments required by major purchasers of coal, attributable to BTU and sulfur content.

The maps and data files created shall be updated annually, using the most recent three (3) calendar years of published data. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures, as determined by the Tax Commissioner. Map interpolation shall

be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.5 Transactions -- The Tax Commissioner shall maintain data files compatible with the Geographic Information System (GIS) which describe the terms, location, size, coal beds, and grantor/grantee of all coal property leases, sales, and permit applications in the State of West Virginia, as available. These transaction files shall be used as:

- An indication of the location and extent of the general interest in coal by ascertaining the number of transactions within a 5 mile radius surrounding a property (leases, sales, and permits). These data shall be incorporated in the GIS; and
- A subset of the lease documents shall be verified by contacting the lessee and/or lessor and used to create the GIS royalty trend map.

The maps and data files created shall be updated annually. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures, as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.6 Royalties -- The Tax Commissioner shall maintain data files compatible with the Geographic Information System (GIS) which describe the terms, location, grantor, grantee, identified coal beds, identified mining method, and the term and royalty rates of leases/coal royalty agreements. Values shall be maintained as a percentage per FOB-source price.

The maps and data files created shall be updated annually using the most recent three (3) calendar years of information. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures, as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.7 Environmental conflicts -- The Tax Commissioner shall maintain data files compatible with the Geographic Information System (GIS) which provide general information concerning environmental restrictions and impediments to mining of coal. This data shall be incorporated into the GIS. Information shall be obtained from the following sources.

West Virginia Division of Environmental Protection
West Virginia Division of Natural Resources
West Virginia Geological and Economic Survey
United States Department of the Interior
Any other sources that may come to the attention of the Tax Commission

The maps and data files created shall be updated when necessary, as determined by the Tax Commissioner. The maps shall be interpolated from the known data points using computer software containing accepted geologic and geographic interpolation procedures, as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.8 Use conflicts -- The Tax Commissioner shall maintain data files compatible with the Geographic Information System (GIS) which specify the location of all gas and oil wells in the state. This data shall be used to correlate historical resource use with potential cost impediments for mining. Sources for this information are the West Virginia Geological and Economic Survey and the West Virginia Division of Environmental Protection, Office of Oil and Gas.

The maps and data files created shall be updated annually. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures, as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.9 Reserve coal property location -- The Tax Commissioner shall maintain files compatible with the Geographic Information System (GIS) which describe the general location, size, and ownership of all reserve properties in the State of West Virginia. These files shall include but are not limited to:

- The geographic location (Latitude and Longitude of at least one point identifying the general location of the property)
In the absence of an identifying location the valuation procedures shall be based on identifying descriptive data such as coal bed name to obtain tax district average values for all pertinent valuation parameters. In the absence of identified coal bed names, the valuation procedures shall be based on the prime coal bed for the District
- The names of coal beds located on the property
In the absence of identified coal bed names the valuation procedures shall be based on the prime coal bed for the District

- The size in acres of the property
- The size in acres of each known coal beds
- The fractional interest of undivided ownership, if available
- The name and address of all owners of record, if available
- Any known previous mining of any coal bed which could affect the use of the property
- Any known current or proposed mining activity affecting the property

The maps and data files created shall be updated annually. The maps shall be interpolated from known data points using computer software containing accepted geologic and geographic interpolation procedures, as determined by the Tax Commissioner. Map interpolation shall be limited by the resolution of the reserve property location, and in the absence of specific location information, valuation parameters shall default to District-level parameters.

4.2.3.10 Production files -- The Tax Commissioner shall maintain data files compatible with the Geographic Information System (GIS) which compile the annual tons of coal produced from all reporting mines. The production files shall be maintained by permit number and shall be used to indicate mineability of specific coal beds, over- and under-mining of specific coal beds and to calculate remaining tonnage. These files shall be based on coal bed-specific production subsequent to 1980, and on the allocation of production and depletion from the best available information for all known (reported) mines prior to 1981. The sources for this data include but are not limited to:

- West Virginia Department of Tax and Revenue
- West Virginia Office of Miner's Health, Safety, and Training

4.2.3.11 Capitalization rate file -- The Tax Commissioner shall maintain data files containing financial and market information to be used to develop the capitalization rate estimate for coal property financing. These files shall include information enabling the development of a capitalization rate as described in Subsection 4.1 of this rule.

4.2.3.12 Active mine data -- The Tax Commissioner shall maintain data files reflecting information used to appraise Active mining property. These files shall include information enabling the valuation of Active mining property as described in Subsection 4.1 of this rule.

4.2.3.13 Reserve coal property coal bed(s) to be valued -- The Tax Commissioner shall determine the name of each coal bed occurring at the reserve property location (either from property descriptive data or, in absence of specific information, by comparing the property with the GIS maps). In all cases the property data

shall be compared to the GIS maps and conflicts shall be resolved either by revising the coal bed maps or by revising the coal bed data contained in the property record file.

4.2.3.14 Reserve coal property coal quantity -- The Tax Commissioner shall determine the quantity of reserves by multiplying the thickness (in feet) of each coal bed at a GIS location by the areal extent of a coal bed (coal bed file) by 1800 tons per acre foot by the typical recovery rate for each coal bed at a GIS location. The reserve tonnage for each coal bed thus determined shall be adjusted as follows:

Over- or Under-Mining	Percent of Subject Coal Bed Over- or Under-Mined	Percent of Subject Coal Bed Considered Mineable
Immediately Below	10 to 20 %	50 %
Immediately Below	20 to 50 %	25%
Immediately Above	20 to 50 %	75%
Immediately Above and Immediately Below	Over 10%	0 %

4.2.3.15 Clean coal recovery rate -- Using the GIS coal bed maps, the GIS historic production files, and the current mining files, the Tax Commissioner shall calculate the recovery rate for each coal bed at all mapped locations. This recovery rate shall be used to determine mineable tonnage and mineable BTU.

4.2.3.16 Reserve coal property prime coal bed -- The Tax Commissioner shall determine the prime coal bed at a location as follows:

- The stratigraphically-highest coal bed which is also the thickest of all coal beds greater than or equal to 28 inches thickness;
- which has been or is currently being mined within the general area of the subject location; and
- which contains sufficient mineable tons to sustain mining for two (2) years in a specified area at the average rate of mining in the bed, in the general area, for the most recent three (3) calendar years.

If the property is too small (less than or equal to 10 acres) to specifically estimate a prime coal bed, then the prime coal bed shall be considered to be the prime coal bed of the general area, as determined by the procedure referenced above.

4.2.3.17 Reserves coal bed valuation factors -- The Tax Commissioner shall determine a valuation factor for each coal bed at a location as follows:

4.2.3.17.a **Market interest factor** -- The Tax Commissioner shall assign a relative market interest factor based upon market transaction GIS maps as follows:

- Less than 3 transactions per 5 mile radius..... factor of 80
- 3 but less than 40 transactions per 5 mile radius..... factor of 40
- 40 or more transactions per 5 mile radius..... factor of 20

4.2.3.17.b **Market mineability factor** -- The Tax Commissioner shall assign a market mineability factor based upon the history of mining of each coal bed as follows:

- no record of mining the coal bed (10 mile radius).....factor of 80
- mining of coal bed in area (10 mile radius) **only** between 1974 and 1983.. factor of 40
- mining of coal bed in area (10 mile radius) prior to 1974 and continuing to present factor of 20

4.2.3.17.c **Prime coal bed factor** -- The Tax Commissioner shall assign a prime coal bed factor to each coal bed occurring on a property as follows:

- if a coal bed does not receive a prime coal bed designation factor of 80
- if a coal bed receives prime coal bed designation factor of 20

4.2.3.17.d **Environmental factor** -- The Tax Commissioner shall assign an environmental factor to each coal bed occurring on the property as follows:

- identified environmental problem which would significantly preclude miningfactor of 80
- identified environmental problem which would significantly impede miningfactor of 40
- identified environmental problem which may affect mining factor of 20
- no identified environmental problem affecting mining at a location

.....factor of 0

4.2.3.17.e **Use conflict factor** -- The Tax Commissioner shall assign a use conflict factor for each coal bed occurring on a property as follows:

- more than 9.6 wells per square mile factor of 80
- between 6.3 and 9.6 wells per square milefactor of 40
- between 3.2 and 6.3 wells per square mile..... factor of 20
- less than 3.2 wells per square milefactor of 0

4.2.3.17.f **Volatility factor** -- The Tax Commissioner shall assign a volatility factor based on the volatility content (using the coal bed characteristics GIS maps and data files) for each coal bed occurring on the property as follows:

- volatility less than or equal to 17% factor of 80
- volatility greater than 17%factor of 0

4.2.3.17.g **Coal bed index factor** -- This factor shall be assigned to each coal bed and expressed as the sum of all the factors referenced above, divided by three and rounded to the nearest value of 20, 40 or 80. This factor shall be used as the exponent "t" for each coal bed, in the present worth formula as described in the following Subdivision 4.2.3.18.

4.2.3.18. **Valuation of individual coal beds per individual reserve coal property** -- The factors to be used by the Tax Commissioner to determine the present value per acre of individual coal beds on individual reserve coal properties are as follows: coal price per million BTU (\$/mmBTU), royalty rate (Roy), BTU and sulfur adjustment factor $[1 \pm (\delta\text{BTU} + \delta\text{S})]$, current market value of one BTU $[(1/(1+i)^{(t+0.5)}) \times (1/10^6)]$, BTU content (BTU), two thousand lbs. per ton (2000), 1800 tons per acre foot (1800), clean coal recovery rate (RR), and thickness in feet (Thk). The formula used in determining the present value per acre per bed (\$/ac/bed) is found at Appendix A, Formula 6 of this rule.

4.2.3.18.a. A narrative version of this formula is as follows:

The base market location value is the starting point of the valuation. The base market location value for a location shall be determined by multiplying the coal price per million BTU for a location (\$/mmBTU) by the royalty rate (Roy) for the location.

A current market location value is then calculated for each coal bed, by multiplying the base market location value by a BTU and sulfur adjustment factor $[1 \pm (\delta\text{BTU} + \delta\text{S})]$ for each coal bed at a location.

The present value of one BTU of each coal bed at a location is then calculated by multiplying the current market location value by $1/\text{million}$ ($1/10^6$), and then multiplying the resulting product by the standard mid year present worth factor calculated as $1/(1+i)^{(t+0.5)}$ where:

- the discount rate is “ i ”
- the valuation factor is the exponent “ t ”

Yielding the present value per acre of a coal bed on a property.

The present value per coal bed per property at a location is determined by:

- multiplying the present value of one BTU, by the BTU per pound of a coal bed at a location, then
- multiplying by 2000 pounds per ton, then
- multiplying by 1800 tons per acre foot, then
- multiplying by the clean coal recovery rate for the coal bed at the location, and then
- multiplying by the thickness of the coal bed at the location, and
- multiplying the present value per acre by the reserve acres of each coal bed at the location

4.2.3.19 Determination of aggregate value. – The aggregate value of all unmined coal in West Virginia shall be determined by multiplying the average coal price by, the average royalty rate by the annual production, divided by the capitalization rate. The formula used to determine the aggregate value is found at Appendix A, Formula 7 of this rule.

4.2.3.20 Determination of aggregate active value – The aggregate active value shall be determined by summing all of the values of active acres on active mining properties for which returns have been timely filed and for which data has been entered into the computer system no later than the November 15th next succeeding the July 1st assessment date.

4.2.3.21 Determination of aggregate reserve value -- The aggregate reserve value shall be determined by subtracting the aggregate active value from the aggregate value as determined in the foregoing subdivision 4.2.3.19.

4.2.3.22 **Final RCVM valuation procedures** -- The Tax Commissioner shall determine the final RCVM value of a coal bed as follows:

4.2.3.22.a. The sum of all the individual property coal bed values throughout the state is calculated to yield the aggregate reserve index. The aggregate reserve value is then divided by the aggregate reserve index yielding the aggregate ratio.

4.2.3.22.b. The individual coal bed index is multiplied by the aggregate ratio, yielding the adjusted individual coal bed value.

4.2.3.22.c. The total value of each individual property is determined by summing all the adjusted individual coal bed values for the property.

4.2.4. **Transitional coal valuation model.** In order to derive the TCVM portion of the value of reserves in this State, the following procedures will be utilized.

4.2.4.1. **Determination of acreage of reserves.** – Based on tax returns filed by property owners and other information, the Tax commission shall annually determine the acreage of reserves, by coal bed, on every reserve coal property in this State. For properties containing more than one mineable coal bed, total appraised mineable acreage will be computed by multiplying each coal bed acreage by a transitional coal bed factor and summing the resulting acreages. The coal bed factors shall be as follows:

4.2.4.1.a. Mineable coal bed acreage that is part of an active mining property is assigned a coal bed factor of 1.

4.2.4.1.b. For other reserve coal property, the mineable coal bed acreages for the two most areally extensive coal beds are assigned a coal bed factor of 1; the third most areally extensive mineable coal bed acreage is assigned a coal bed factor of 0.75. Any remaining mineable coal acreage is assigned a coal bed factor of 0.50 each.

4.2.4.1.c. The sum of all of these mineable coal bed acres, multiplied by their respective coal bed factor, will be the transitional coal reserve acres for each property.

4.2.4.2. **Valuation of reserves** – The value of transitional coal reserve acres shall be determined as follows:

4.2.4.2.a. **County transitional reserve value** – A county transitional reserve value is determined for each county by multiplying a transitional reserve coal index value by an applicable county valuation factor, both of which are discussed below.

4.2.4.2.a.1. **County valuation factor** – The county valuation factor is a relative measure of the value of reserves for each county.

4.2.4.2.a.1.A. A County Valuation Factor of 2 is assigned to the following counties: Berkeley, Cabell, Calhoun, Doddridge, Hampshire, Hancock, Hardy, Jackson, Jefferson, Monroe, Morgan, Pendleton, Pleasants, Pocahontas, Putnam, Ritchie, Roane, Tyler, Wetzell, Wirt, Wood and the northeast portion of Kanawha County (Jefferson, Union, Poca, and part of Big sandy and Elk districts that lie north of Elk River).

4.2.4.2.a.1.B. A County Valuation Factor of 4 is assigned to the following counties: Braxton, Brooke, Clay, Gilmer, Greenbrier, Harrison, Lewis, Marion, Marshall, Mason, Monongalia, Nicholas, Ohio and Webster.

4.2.4.2.a.1.C. A county Valuation factor of 3.75 is assigned to the following counties: Barbour, Grant, Mineral, Preston, Randolph, Taylor, Tucker and Upshur.

4.2.4.2.a.1.D. A County Valuation Factor of 5.5 is assigned to the following counties: Boone, Fayette, Lincoln, Logan, McDowell, Mercer, Mingo, Raleigh, Summers, Wayne, Wyoming and the southeast portion of Kanawha County (Washington, Malden, Loudon, Cabin Creek districts, and part of Big sandy and Elk districts which lie south of Elk river).

4.2.4.2.a.2. **Transitional reserve coal index value** – The transitional reserve coal index value shall be determined as follows:

4.2.4.2.a.2.A. **Transitional county index acreage.** – The transitional county index acreage is the sum of all transitional reserve coal acres in a county multiplied by the county valuation factor for that county. Each county will have its own transitional county index acreage.

4.2.4.2.a.2.B. **State reserve index acreage** – The state reserve index acreage is the sum of all transitional county index acreages.

4.2.4.2.a.2.C. **Transitional reserve coal index value** – The transitional reserve coal index value is determined by dividing the aggregate reserve value (as determined in 4.2.3.20 of this rule) by the state reserve index acreage.

4.2.4.2.b. **Final transitional coal valuation model valuation procedure** – The Tax Commissioner will determine the final TCVM value of a coal bed on a property by multiplying the transitional coal reserve acres for the property by the applicable county valuation factor and then multiplying the resulting amount by the transitional reserve coal index value.

4.3 Valuation of unmineable coal properties. -- Unmineable coal shall be valued under one of the following circumstances:

4.3.1 Parcels in which each and every coal bed is unmineable or where each bed is partially unmineable and the remaining portion is mined out, shall be valued at a rate of five dollars (\$5.00) per deed acre; and

4.3.2 Parcels in which an acre or more of unmineable coal coexists with mineable coal in any bed, shall be valued at a rate of five dollars (\$5.00) times the amount of unmineable acreage in the bed containing the least amount of unmineable acreage.

4.4 Valuation of mined-out coal properties. Mined-out coal property shall be valued under one of the following circumstances:

4.4.1 Parcels in which each and every coal bed is completely mined-out, shall be valued at a rate of one dollar (\$1.00) per deed acre; and

4.4.2 Parcels in which an acre or more of mined-out coal coexists with mineable coal in any bed, shall be valued at a rate of one dollar (\$1.00) times the amount of mined-out acreage in the bed containing the least amount of mined-out acreage.

4.5 Valuation of barren coal properties. Barren coal properties shall be valued under one of the following circumstances:

4.5.1 Parcels in which each and every coal bed is completely barren shall be valued at a rate of one dollar (\$1.00) per deed acre; and

4.5.2 Parcels in which an acre or more of barren coal coexists with mineable coal in any bed, shall be valued at a rate of one dollar (\$1.00) times the amount of barren acreage in the bed containing the least amount of barren acreage.

4.6 Total coal appraisal. -- The total coal appraisal for any coal parcel is the sum of the value for all active acres, all reserve acres and proper administrative values calculated for unmineable, mined-out, and barren acreage. The total amount of coal acres valued for any parcel shall not be less than the amount of deed acres.

4.7 Leasehold interests. -- This rule generally attributes the value of coal to the owner of the coal property. In those circumstances where the owner of the property is subject to a lease requiring the owner to permit mining at royalty rates substantially below current market rates, the owner may petition the Tax Commissioner to attribute a portion of the value of the coal determined by this rule to the leaseholder.

4.8 Farm properties. -- The coal rights, that are part of a "fee" estate where the use of the surface has qualified for farm use appraisal, shall be valued as described in the Division's rule, Valuation of Farmland and Structures situated thereon for Ad Valorem Property Tax Purposes, 110 C.S.R. 1A.

4.9 Property reports. -- On or before September 1st of each year the producer is required to file an Annual Appraisal Report for Production of Coal with the Tax Commissioner with acknowledgement to the coal owners and the county assessors of the counties in which the mine is located. On or before September 16th of each year, the coal owner of any property that is part of a permitted mining operation under lease is required to file an Annual Appraisal Return for Reserve Mineral Properties with the Tax Commissioner. Owners of other coal properties may file an Annual Appraisal Return for Reserve Mineral Properties, on or before September 16th, with the Tax Commissioner; otherwise the properties shall be valued using the best available information.

4.10 Confidentiality -- All information provided by or on behalf of a natural resources property owner or by or on behalf of an owner of an interest in natural resources property to any state or county representative for use in the valuation or assessment of natural resources property or for use in the development or maintenance of a legislatively funded mineral mapping or geologic information system is confidential. The information is exempt from disclosure under provisions of West Virginia Code § 29B-1-4, and shall be kept, held, and maintained confidential except to the extent the information is needed by the State Tax Commissioner to defend an appraisal challenged by the owner or lessee of the natural resources property subject to the appraisal: Provided, That this section may not be construed to prohibit publication or release of information generated as part of the minerals mapping or geologic information system, whether in the form of aggregated statistics, maps, articles, reports, professional talks, or otherwise presented in accordance with generally accepted practices and in a manner so as to preclude the identification or determination of information about particular property owners.

APPENDIX A

Formula 1

$$\text{Annual Acres Mined} = \frac{\text{Annual Production}}{\text{Ave. Thickness} \times 1800 \times \text{Clean coal recovery rate}}$$

Formula 2

$$1800 \text{ tons/ac.ft.} = \frac{(62.4 \text{ lbs.water/ft}^3) \times (1.32 \text{ lbs.coal/1 lb.water}) \times (43,560 \text{ ft}^2/\text{acre}) \times (1 \text{ Thk})}{2000 \text{ lbs./ton}}$$

WHERE: Thk = 1 foot thickness

Formula 3

$$$/\text{ac} = \frac{[(\text{Thk}) \times (1800) \times (\text{RR}) \times (\text{SRoy}) \times (\text{SCM}) \times (\text{M})] + [(\text{Thk}) \times (1800) \times (\text{RR}) \times (\text{MRoy}) \times (\text{MCM}) \times (\text{M})]}{\text{ML}}$$

Where: \$/ac = appraisal rate per acre

Thk = coal thickness in feet

1800 = 1800 tons per acre foot

RR = clean coal recovery rate

SRoy = steam coal royalty rate

SCM = decimal representing percent of coal sold to steam market

M = net present value multiplier

Thk = coal thickness in feet

MRoy = Metallurgical coal royalty rate

MCM = decimal representing percent coal sold to metallurgical market

ML = mine life in years

Formula 4

$$\text{VAMP} = (\text{AAM}) \times (\text{ML}) \times (\text{\$/ac})$$

Where: VAMP = value of active mining portion

AAM = annual acres mined

ML = mine life in years

\$/ac = value per active acre

Formula 5

$$\text{tons} = (\text{Thk}) \times (\text{ac.}) \times (1800) \times (\text{RR})$$

Where: tons = Reserve Property Coal Quantity
 Thk = Thickness in feet of a coal bed
 ac. = areal extent of coal bed
 1800 = 1800 tons per acre foot
 RR = clean coal recovery rate

Formula 6

$$\$/\text{ac}/\text{bed} = (\$/\text{mmBTU}) \times (\text{Roy}) \times [1 \pm (\delta\text{BTU} + \delta\text{S})] \times \left[\frac{1}{(1+I)^{(t+0.5)}} \right] \times (1/10^6) \times (\text{BTU}) \times (2000) \times (1800) \times (\text{RR}) \times (\text{Thk})$$

Where: \$/ac/bed = present value per acre of an individual coal bed on an individual property
 \$/mmBTU = coal price (FOB-source) per million BTU
 Roy = average royalty rate
 $[1 \pm (\delta\text{BTU} + \delta\text{S})]$ = BTU and sulfur adjustment factor
 $\frac{1}{(1+I)^{(t+0.5)}}$ = standard mid-year present worth factor
 $(1/10^6)$ = 1 divided by 1,000,000
 BTU = BTU content of one pound of dry coal by coal bed by location
 2000 = two thousand lbs. per ton
 1800 = 1800 tons per acre foot
 RR = clean coal recovery rate
 Thk = coal bed thickness in feet

Formula 7

$$\text{Aggregate value} = \frac{(\text{Ave. Coal price}) \times (\text{Ave. Royalty rate}) \times (\text{Annual production})}{\text{Capitalization rate}}$$