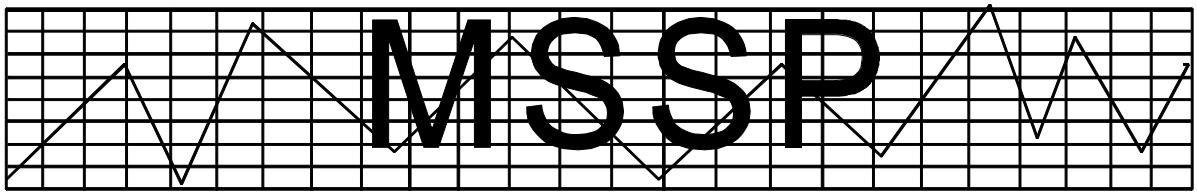

Market Segment Specialization Program

Coal Excise Tax

The taxpayer names and addresses shown in this publication are hypothetical. They were chosen at random from a list of names of American colleges and universities as shown in Webster's Dictionary or from a list of names of counties in the United States as listed in the United States Government Printing Office Style Manual.

This material was designed specifically for training purposes only. Under no circumstances should the contents be used or cited as authority for setting or sustaining a technical position.

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COAL EXCISE TAX

FOREWORD

This Market Segment Specialization Program (MSSP) guide was developed to provide excise tax agents with specific tools to examine issues relating to domestic produced coal. The guide provides guidance on 12 potential audit issues, general audit guidelines, sample IDR requests, a glossary of mining terms, and includes background information on the coal mining industry.

The examples and the citations in this guide are based upon 1993 law. While some of the provisions of IRC sections 4121, 4216, and 6416 are explained, the primary focus of the module is not an in-depth explanation of the law, but rather a guide to audit issues.

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Chapter 1

INTRODUCTION

BLACK LUNG

The Black Lung Benefits Act of 1977 was enacted by Congress to compensate individuals afflicted with the disease known as pneumoconiosis or "black lung disease." Black lung disease is caused by inhaling coal dust for prolonged periods of time, usually at least 10 years. In the early stages, black lung disease does not cause respiratory impairment. However, impairment eventually occurs and despite avoidance of further exposure, death usually occurs within a few years.

IMPOSITION OF COAL EXCISE TAX

Section 4121 of the Internal Revenue Code imposes an excise tax on domestically produced coal. The taxes collected on the sales of coal are deposited to the Black Lung Disability Trust Fund to finance payments of black lung benefits to afflicted miners.

Producers of coal in the United States are liable for the tax upon the first sale or use of the coal. The producer is the person who has vested interest in the coal immediately after its severance from the ground without regard to the existence of any contractual arrangements for the sale or other disposition of the coal or the payment of any royalties between the producer and third parties.

The tax is imposed at two rates, depending on whether the coal is from underground (deep) or surface mines. The tax on deep mined coal is the lower of $1.10 a ton or 4.4 percent of the sales price. The tax on surface mined coal is the lower of $.55 a ton or 4.4 percent of the sales price. Therefore, coal will be taxed at the 4.4 percent rate if the selling price is less than $25/ton for deep coal or less than $12.50/ton for surface coal.

Using a Federal Tax Deposit form, the taxpayer should make semi-monthly deposits based on the incurred liability. (Form books can be obtained by calling 1-800-829-1040.) Additionally, excise taxes are reported on the quarterly filed Form 720 (Quarterly Federal Excise Tax Return). The due date of the return is the last day of the month following the end of the quarter.

ISSUE IDENTIFICATION

Examinations of coal producers have identified numerous recurring issues resulting in substantial understatements of coal excise tax liabilities. This guide includes 12 potential audit issues related to the coal excise tax; each section includes a brief explanation, cites the appropriate Code sections and references, and identifies helpful audit techniques.

BACKGROUND INFORMATION

In the appendices you will find a glossary of mining terms and referral to additional reading material on the coal mining industry.

Chapter 2

EXAMINATION ISSUES, TECHNIQUES, AND LAW

ISSUE 1 -- EXCESS MOISTURE REDUCTION

Issue

Is it permissible to reduce the taxable weight of coal by excess moisture and what method should be used by taxpayers in calculating this reduction in taxable weight?

Explanation

In computing the IRC section 4121 tax on coal, the taxpayer is allowed a calculated reduction of the taxable weight of coal for the weight of excess moisture, but only where the taxpayer can demonstrate through competent evidence that there is a reasonable basis for the existence and amount of excess moisture. Excess moisture may be determined by subtracting the equilibrium moisture from the total moisture.

Law

1. ***A. J. Taft Coal Co., Plaintiff v. United States of America, Defendant***, 605 F.Supp. 366 (N.D. Ala. 1984), ***aff'd without opinion***, 760 F.2d 280 (11th Cir. 1985).

   The Court allowed a taxpayer to reduce its black lung excise tax by the additional weight of coal sold which resulted from weight of the excess moisture of the coal. The Court interpreted the regulations to exclude weight of the water which is in excess of the inherent moisture of coal, provided that it can be reasonably determined.

2. ***Revenue Ruling 86-96***, 1986-2 C.B. 181.

   For purposes of the tax imposed by section 4121 of the Code, the Internal Revenue Service will follow the ***Taft Coal Co.*** decision regarding the moisture content of coal. The Service will allow a calculated reduction of the taxable weight of coal for the weight of excess moisture, but only where the taxpayer can demonstrate through competent evidence that there is a reasonable basis for its determination of the existence and amount of excess moisture.

Techniques

1. Ask if the taxpayer is reducing coal tonnage for the excess moisture. Generally, a reduction for excess moisture should not be taken when Federal Excise Tax (FET) is based on the selling price of the coal (sales price method, since FET does not change). Refer to the examples below which reflect the exception when sales price approaches thresholds of $25 (deep coal) or $12.50 (surface coal) per ton.

   Example 1

   Deep coal is sold at $24.75 per ton f.o.b. mine. A total of 100 tons, including excess moisture, was sold. Excess moisture is determined to be 6 tons.

   100 tons sold (including excess moisture)
   -6 tons excess moisture (water)
   94 tons of coal sold at $2,475 (amount taxpayer will collect).

   $\frac{\$2,475.00}{94 \text{ tons}} = \$26.33$ per ton of coal (price per ton recalculated)

   Excise tax limited to $1.10 per ton.

   $94 \text{ tons of coal} \times \frac{\$1.10}{\text{ton}} = \$103.40$

   (If the tax had been collected at 4.4 percent on 100 tons, the amount would have been $2,475 x 4.4 percent = $108.90).

   We do not, however, as some taxpayers have attempted, allow them to calculate their excise tax based on 94 tons shipped at $24.75 per ton for a rate of $2,326.50 x 4.4 percent = $102.37. The gross sales price of the coal should remain at $2,475.

Example 2

Coal is sold at $22 per ton f.o.b. mine. A total of 100 tons, including excess moisture, is sold. Excess moisture is determined to be 6 tons.

100 tons sold (including excess moisture)
-6 tons excess moisture (water)
94 tons of coal sold at $2,200.00 (amount taxpayer will collect)

$2,200.00 = $23.40 per ton of coal
94 tons (price per ton recalculated)

Excise tax at 4.4 percent of $23.40 per ton = $1.03 per ton x 94 tons of coal sold equal total tax of $96.82.

NOTE 1: If no deduction for excess moisture had been allowed, 100 tons would have been taxed at $22 per ton. $22 x 4.4 percent = .968 per ton x 100 tons equals $96.80. The 2 cent difference ($96.82 above and $96.80 here), is due to rounding. The tax is the same as it was with excess moisture deducted.

NOTE 2: Refer to Issue 3 -- Sales Price Inclusive of Federal Excise Tax (FET) for sales less than the threshold price.

2. Have the taxpayer explain the method used in determining the total and inherent moisture.

3. Examine the taxpayer's workpapers for reasonableness and inquire if OSM has examined and/or accepted the method used for moisture calculation.

4. What ASTM testing method was used? Was it ASTM D1412-93? Inspect lab reports and verify calculation in arriving at the average percent of excess moisture applied to total weight.

5. When deemed necessary, insist on chemical analysis, as per ASTM D1412-93. Tests should be done on the same seams as those claimed for the moisture reduction.

6. If you believe the methods used do not satisfy Rev. Rul. 86-96, the issue may be referred to an engineer.

7. Low rank or wetter coals, often found in the western United States, may require application of a correction factor to the results of the ASTM D1412-93 testing procedure to determine inherent moisture.

Conclusion

Coal sold at a selling price of less than $25/ton (deep mined) or $12.50/ton (surface mined) requires a recalculation of price per ton, when excess moisture is deducted. If the recalculated price is above $25 per ton, there will be a reduction in tax.

ISSUE 2 -- PRODUCER VERSUS CONTRACT MINER

Issue

Who is liable for the coal tax when the miner does not posses an ownership interest under state law?

Explanation

IRC section 4121 imposes a tax on coal sold or used by the producer after March 31, 1978. The producer is defined as the person in whom is vested ownership of the coal under state law immediately after the coal is severed from the ground, without regard to the existence of any contractual agreement for the sale or other disposition of the coal or the payment of any royalties between the producer and third parties. Thus, the owner of the coal and not the contract miner would be liable for the IRC section 4121 tax for coal.

Law

1. Treas. Reg. section 48.4121-1(a)(1).

   IRC section 4121(a) imposes a tax on coal mined at anytime in this country if the coal is sold or used by the producer after March 31, 1978. For purposes of this section, the term "producer" means the person in whom is vested ownership of the coal under state law immediately after the coal is severed from the ground, without regard to the existence of any contractual arrangement for the sale or other disposition of the coal or the payment of any royalties between the producer and third parties.

Example 3

"A", a limited partnership, is the owner of land on which a coal mine is located. "A" contracts with "XYZ" Company to extract the coal for a set price per ton. "XYZ" is an independent contractor and has no ownership interest in the coal mined. Under state law, "A" is the owner of the coal immediately after severance. After "XYZ" extracts the coal from the mine, "A" sells the coal. "A" is the producer of the coal and is responsible for the payment of the excise tax.

2. ***JoAnn Coal Co.***, CA-4, 1989-2 U.S.T.C. para. 16,474.

   The Court's ruling that the taxpayer incurred liability for FET as a coal producer when it was determined that it could sell the coal to whomever it wanted and for whatever price it wanted to charge. The Court was not persuaded by agreements or right to terminate, but who had dominion over the coal after it was mined.

Techniques

1. Determine if the taxpayer is a contract miner or uses a contract miner to mine the coal.

2. Review contract mining agreements to determine who owns the coal under state law upon severance from the ground.

3. Federal excise tax liabilities may not be assigned. Treas. Reg. section 48.4121-1 is specific as to the liability of the producer, without regard to the existence of any contractual arrangement for the sale or other disposition of the coal or the payment of any royalties between the producer and third parties.

4. It is important to note that a contract miner who erroneously pays FET may subsequently file a claim for refund and the IRS may be required to refund the FET since the contract miner was not liable for the original tax paid.

ISSUE 3 -- SALES PRICE INCLUSIVE OF FEDERAL EXCISE TAX

Issue

How do we determine the FET when it is included in the sale price?

Law

Treas. Reg. section 48.4216(a)-2(a)(1).

Taxes imposed by Chapter 32 are not to be included as part of the taxable sale price of an article and no tax is due on the tax so charged. When no separate charge is made as to the tax, it will be presumed that the price charged to the purchaser for the article includes the proper tax, and the proper percentage of such price will be allocated to the tax.

Techniques

1. Be aware that if the taxpayer is using the sales price method, it is presumed the sales price includes FET. Therefore, if you pick up additional tax based on sales price, you should reduce the sale price by the presumed inclusion of FET. See Treas. Reg. section 48.4216(a)-2(a) for sample calculation.

   Computation of Sales Price

   The Black Lung Benefit Trust excise tax is a manufacturer's tax. As such, it is assumed the tax is included in the sales price of the coal.

   Example 4

   Underground coal sold for $21.50 per ton:

1. Assume 1,000 tons sold @ $21.50 per ton	$21,500
2. Divide by 104.4 percent (100 percent equals selling price, plus 4.4 percent equals tax)	104.4%
3. Adjusted sales price (without FET)	$20,594
4. Times tax rate of 4.4 percent	4.4%
5. Federal Excise Tax due	$ 906

   Proof: $20,594 + $906 = $21,500 (sales price)

2. If the taxpayer is filing a claim, a consent is required from the ultimate purchaser of the coal. See **Issue 12,** Claim for Refund Issue, for discussion.

ISSUE 4 -- PURCHASED COAL

Issue

How is a producer's tax liability for coal calculated when that producer also purchases coal from unrelated producers?

Explanation

This question can be divided into two areas:

1. Taxpayers may purchase raw coal and mix it with their own raw coal. They clean the coal and sell all of it on a clean basis. Taxpayers may not subtract raw coal purchased from clean coal sold to arrive at taxable coal.

   However, if taxpayers purchase clean coal and mix it with clean coal, and then sell all the coal on a clean tonnage basis, the total tons sold can be reduced by the clean coal purchased.

   Finally, if taxpayers purchase raw coal and mix it with their own clean or raw coal, and then sell the resultant coal, the total coal sold can be reduced by the raw coal purchased.

2. The purchase of the coal must be between unrelated parties at fair market value. If the coal was purchased from a related company at less than fair market value, then IRC section 4216(b), dealing with constructive sales price, should be used. The general rule, when inter-company sales are not arm's-length transactions, is that the fair market price is held to be the price received by the company that finally sold to an unrelated company. (***Inecto. Inc.***, 37-2 U.S.T.C. para. 9554, 21 F.Supp. 418.)

Law

1. Treas. Reg. section 48.4121-1(a), provides, in part:

   Extract

   * * * Section 4121 imposes a tax on coal mined at anytime in this country if the coal is sold or used by the producer after March 31, 1978 * * *

For purpose of this section, the term "producer" means the person in whom is vested ownership of the coal under state law immediately after the coal is severed from the ground, without regard to the existence of any contracted arrangement for the sale or other disposition of the coal or the payment of any royalties between the producer and third parties.

Example 5

A company is the producer of coal when it is shown that it has ownership under state law and a company, which is an independent contractor, has no ownership of coal and is not responsible for excise tax payments. Refer to Issue 2.

2. Regulation section 48.4216(b)-1.

   This regulation generally provides that section 4216(b) pertains to those taxes imposed under IRC section 4121 that are based on the price for which an article is sold, and contains the provisions for constructing a tax base other than the actual sale price of the article, under certain defined conditions.

3. ***Inecto, Inc.***, 37-2 U.S.T.C. para. 9554, 21 F.Supp. 418.

   When the Court found that sales outside the affiliated group were for much more than the intercompany group sales, the Court ruled that the sales were not at arm's length. The Court findings that the intercompany sales were at less than the fair market value were sustained by evidence.

Discussion

One difficulty in administering the excise tax for "purchased coal" is determining whether there was an arms-length purchase or if the payment for the coal was to a contract miner. Agents should review the actual contract between the purchaser and seller when the nature of transaction (arms-length transactions and/or producer versus contract miner) is an issue. Intercompany or related party purchases and sales should be looked at very carefully if arms-length transactions are a question. If the entity being examined is reducing taxable sales by purchased coal, verify that the entity does, in fact, have purchased coal.

Techniques

1. Inspect coal purchase orders.

2. Inspect vendor invoices for the purchased coal for both the number of tons and the

dollar amount paid.

3. Determine how the purchased coal is resold. Is it sold as is or is it blended with the "producers" own coal? If it is blended, is the "producer" properly reducing for purchased coal? The producer must be able to substantiate purchased coal allowances.

4. Third-party contacts may be beneficial (confirmation with the seller of the coal) as to tons purchased and amounts paid.

5. If the taxpayer being examined is both a "producer" and purchaser of coal, the examiner must consider that some purchased coal could be in ending inventory. Therefore, more produced coal would have been sold, resulting in more FET owed.

6. Is an excess reduction being taken for purchased coal? The taxpayer may not subtract raw coal purchased from clean coal sold if the taxpayer cleans the purchased coal; therefore, examine any reduction for purchased coal.

7. NOTE: Sales between related parties may contain reductions to taxable sales price for commissions and markups. These are specifically <u>not</u> excludable under Treas. Reg. section 48.4121-1(c).

8. Purchased coal may often provide follow-up leads. Ensure that FET was paid by the producer of the purchased coal.

9. Contact the district and/or regional engineering group for representative market prices of coal.

ISSUE 5 -- TRANSPORTATION COSTS IN SALES PRICE

Issue

Should transportation costs be excludable in arriving at the taxable sales price of coal?

Explanation

The taxable sales price of coal includes all transportation costs up to the point of sale. Transportation costs which may be excludable from sales price are discussed below.

Law

1. IRC section 4216.

   In determining, for the purposes of this chapter, the price for which an article is sold, there shall be included any charge for coverings and containers of whatever nature, and any charge incident to placing the article in condition packed ready for shipment, but there shall be excluded the amount of tax imposed by this chapter, whether or not stated as a separate charge. A transportation, delivery, insurance, installation, or other charge (not required by the foregoing sentence to be included) shall be excluded from the price only if the amount is established to the satisfaction of the Secretary in accordance with the regulations.

2. Treas. Reg. section 48.4216(a)-2(b)(1).

   Charges for transportation, delivery, insurance, installation, and other expenses actually incurred in connection with the delivery of an article to a purchaser pursuant to a bona fide sale shall be excluded from the sale price in computing the tax.

Discussion

Transportation costs incurred by the producer/seller of coal beyond its mine or cleaning plant (if the coal is cleaned before sale) are deductible by the producer if their FET is based upon the sales price method.

Treas. Reg. section 48.4121-1(d)(4) states, in part, for purposes of determining both the amount of coal sold by a producer and the sales price of the coal, the point of sale is f.o.b. mine, or f.o.b. cleaning plant if the producer cleans the coal before selling it.

Example 6

A deep mine coal producer removes coal from a mine, transports it to a cleaning plant and then sells it to a coal broker at a price of $27 per ton, delivered to the broker's business, 25 miles from the producer's cleaning plant. The shipment is made by an unrelated carrier at an arms-length transaction price of $2.50 per ton.

The producer is allowed to reduce the sales price when calculating the FET by $2.50, and thereby, arrives at a $24.50 per ton sales price. If the producer transports the coal to the purchaser with his own equipment, a deduction for actual hauling costs from the cleaning point to the purchaser's business would

be allowable.

Keep in mind that the deduction for transportation costs will only affect excise tax calculations when the deductible transportation cost brings the price per ton to an amount below $25 (for underground mines) or $12.50 per ton (for surface mines), or reduces the sales price per ton that are already below these amounts, to an even lower figure.

Techniques

1. Inspect workpapers detailing how the taxpayer arrived at FET per return. Deductions for transportation costs should be verified.

2. Verify that the costs paid to an outside carrier were arms-length transactions.

3. If the taxpayer transports his or her own coal, verify that the producer is deducting only the actual hauling costs.

4. Examiner should consider IRC section 4216 and Treas. Reg. sections 48.4216(a)-2(b)(1),(2),(3) with regard to transportation charges pursuant to a sale.

ISSUE 6 -- FREEZE DRIED ADDITIVE

Issue

Is the cost of adding a freeze-dried additive to coal allowed as a reduction in computing the taxable sales price of coal?

Explanation

Treas. Reg. section 48.4216(a)-2(b)(1) provides that charges excluded by IRC section 4216(a) "include all items of transportation, delivery, insurance, installation and similar expenses incurred after shipment to a customer begins, in response to a customer's order pursuant to a bona fide sale." Thus, if the freeze-dried additive is applied to the coal when it is in the railroad car while being shipped to the customer, the fee would be excludable from selling price; however, if the freeze-dried additive is added to the coal before being loaded into the rail car, the additive fee would not be excludable in computing the taxable selling price of the coal.

Law

1. IRC section 4216.

   In determining, for the purposes of this chapter, the price for which an article is sold, there shall be included any charge for coverings and containers of whatever nature, and any charge incident to placing the article in condition packed ready for shipment.

2. Treas. Reg. section 48.4216(a)-2(b)(1).

   In any event, no charge may be excluded from the sale price unless the conditions set forth in this regulation section are complied.

3. Revenue Ruling 86-16, 1986-1 C.B. 321.

   In computing the taxable sale price of coal for purposes of the tax imposed by section 4121 of the Code, a charge for the application of a freeze dried additive to the coal is includible where the additive is added prior to delivery.

Techniques

1. Inspect workpapers detailing how the taxpayer arrives at FET per return; a deduction for freeze-dried additive should be questioned.

2. This is only an issue if the sales price method is being used.

ISSUE 7 -- RAW VERSUS CLEAN TONNAGE

Issue

Should the tax imposed by IRC section 4121 be based on raw or clean tonnage sold?

Explanation

The excise tax on coal applies to the full tonnage of raw coal sold by a producer. No reduction is allowed for extraneous materials subsequently removed. The tax applies when a sale is made or when title passes. If the coal is in its raw state when title passes, then the tax is based on raw tons. If the coal has been cleaned before title passes, then the tax is based on clean tons sold.

Law

1. Treas. Reg. section 48.4121-1(d)(4).

   For purposes of determining both the amount of coal sold by a producer and the sales price of the coal, the point of sale is f.o.b. mine, f.o.b. cleaning point if the producer cleans the coal before selling it. This is true even if the producer sells the coal on the basis of a delivered price. Accordingly, f.o.b. mine or cleaning point is the point at which the number of tons sold is to be determined for purposes of applying the applicable tonnage rate, and the point at which the sale price is to be determined for purposes of the tax.

2. Revenue Ruling 79-119, 1979-1 C.B. 350.

   A producer extracts raw coal from mines and sells it to a coal preparation plant operator. Upon arrival at the plant, the raw coal is weighed and then unloaded on a raw coal stockpile that includes raw coal purchased from various mine operators. The plant operator pays the producer for each long ton (2240 pounds) of coal delivered, separates the extraneous rock and dirt from all of the raw coal, and sells the resulting clean coal to the consumer.

   The excise tax on coal applies to the full tonnage of raw coal sold by a producer to a preparation plant operator (who cleans it for resale to consumers) with no reduction for extraneous materials subsequently removed.

3. ***Moose Coal Co. v. United States***, U.S.T.C. 1992-1, paragraph 70014.

   The Court, upon review of the evidence in this case, found taxpayer was responsible for washing its raw coal, and therefore, the tax should be based upon the clean tonnage. The point of sale was determined to be after the cleaning, even though they delivered only raw coal to the purchaser, because payments the coal company received were based upon the tonnage of clean coal.

Techniques

1. Inspect workpapers detailing how the taxpayer arrives at FET per return.

2. Determine if the taxpayer is selling clean or raw coal.

3. Determine who is cleaning the coal: seller or buyer.

4. Review contracts (purchase, cleaning, sales, etc.) to determine when title passes.

5. Question the use of reject percentages. Reject percentages are often used as a constant reduction with little or no documentation to substantiate the rejection rate used. Reject percentages represent the amount of waste material removed from raw coal to obtain clean coal.

ISSUE 8 -- MIX OF UNDERGROUND AND SURFACE COAL

Issue

If coal sold is a mixture of underground and surface coal, how is the tax liability under IRC section 4121 determined?

Explanation

Revenue Ruling 80-125 addresses the issue of determining the tax rate for underground and surface coals that are blended (during cleaning) prior to sale. The ruling holds that the tax is based on the proportion of each type of coal contained in the end product and the selling price of the coal sold is taken into account for purposes of the percentage limitation.

In cases where coal is produced from both underground and surface mines and placed in inventory, it is not appropriate to allocate sales based only on production percentages. The various inventory amounts must be taken into account and sales must be allocated based upon the underground and surface inventories available.

Law

-- Revenue Ruling 80-125, 1980-1 C.B. 246.

Computation of the excise tax on coal is illustrated from sales by the producer of surface-mined coal and underground-mined coal that are blended together during cleaning. When the proportion of surface and underground coal is determinable, the tax should be based upon a proportion of each type of coal contained in the end product and the selling price of the coal sold. When the proportion is not determinable, the ratio of the original input of surface and underground coal is used to compute the tax.

Discussion

This is a possible excise tax issue if a coal producer is mining both from underground and surface mines. While producing out of both deep and surface mines may not be common for most coal producers, it certainly is not rare. With the excise tax at

different rates for underground and surface produced coal, it is important that the producer correctly report sales and/or use from the different mines.

Coal is sometimes mined, taken directly to a stockpile and placed into inventory with subsequent sales being made out of the inventory. In some cases, coal is mined and sold directly without ever being inventoried.

In the first case, it is not appropriate to allocate sales based solely on production percentages. The various inventory amounts must be taken into account and the sales must be allocated based on the inventory of the two classes available for sale (not just production of the two classes).

Most coal companies have detailed records and can verify the original production to establish beginning inventories and any subsequent additions or removals from inventory. In those cases where no beginning inventory can be determined, it is appropriate for the examiner to arrive at the beginning inventory (by class) for each period, by taking the average percentage of coal produced (by class) over a long period of time and applying this percentage to the total beginning inventory; thereby arriving at an inventory amount for a particular class.

Examples 7 and 8 use extreme amounts, but clearly illustrate the problem and the correct inventory method. This issue is much easier if the stockpile was started during the period being examined.

Example 7

Incorrect Method

	Underground	%	Surface	%	Total	%
Beg. Inv. (Tons)	500,000	50%	500,000	50%	1,000,000	100%
1st Qtr. Prod.	100,000	10%	900,000	90%	1,000,000	100%
Total Available	600,000	30%	1,400,000	70%	2,000,000	100%
Total Sales	160,000	10%	1,440,000	90%	1,600,000	100%

The above example demonstrates sales on the production percentage alone would result in far too much of the coal sold being classified as surface coal taxed at $.55 per ton rather than as underground coal taxed at $1.10 per ton.

Example 8

Correct Method

	Underground	%	Surface	%	Total	%
Beg. Inv. (tons)	500,000	50%	500,000	50%	1,000,000	100%
1st qtr. prod.	100,000	10%	900,000	90%	1,000,000	100%
Total available	600,000	30%	1,400,000	70%	2,000,000	100%
Total sales	480,000	30%	1,120,000	100%	1,600,000	100%
End. Inv. 1st qtr.	120,000	30%	280,000	70%	400,000	100%

These two examples illustrate that by using an incorrect method, the taxpayer could have understated the tax liability on 320,000 tons (480,000 minus 160,000).

Techniques

1. Determine if the taxpayer has both deep and surface coal mines.

2. Determine if the taxpayer is selling both deep and surface coal; determine the method for allocating or tracking sales for each type.

3. Determine inventory method if the taxpayer is stockpiling coal.

4. Determine if sales are specific as to origin or if the are commingled?

5. Be familiar with Revenue Ruling 80-125 for the proper method of calculating FET when the taxpayer is selling blended coal from both sources.

ISSUE 9 -- RIVERBED DREDGING

Issue

Is coal extracted from a riverbed by dredging operations subject to IRC section 4121 tax on coal?

Explanation

Coal extracted from a riverbed by dredging operations will not be subject to IRC section 4121 when the taxpayer can demonstrate that the coal had been previously taxed. If the taxpayer cannot demonstrate that the coal had been previously taxed, then Code section 4121 is applicable.

Law

1. Treas. Reg. section 48.4121-1(a)(1).

   For purposes of this section, the term "producer" means the person in whom is vested ownership of the coal under state law immediately after the coal is severed from the ground.

2. Revenue Ruling 92-30, 1992-1 C.B. 355.

   Coal extracted from a riverbed by dredging is not subject to the tax imposed by section 4121(a) of the Code to the extent that the taxpayer can demonstrate that such coal has previously been taxed.

3. Revenue Ruling 87-21, 1987-1 C.B. 310.

   Coal extracted from a riverbed by dredging is subject to the tax imposed by section 4121(a) of the Code at the rate imposed on coal from surface mine. (Caution: see modification made by Rev. Rul. 92-30.)

4. ***Kanawha Dredging and Mineral Co., Ltd***, (88-1 U.S.T.C., 16,463).

   The Court ruled that the taxpayer's sale of dredged coal was not subject to the tax imposed by section 4121(a) of the Code. In so ruling, it noted that 95 percent of the dredged coal had been previously taxed. The taxpayer used the testimony of an expert witness to convince the Court that coal in the river was almost exclusively from spillage during transportation.

Techniques

1. Ask the taxpayer if any riverbed coal is being reclaimed or recovered.

2. Inspect mining permits for identification of coal sources.

3. Reconcile coal sales to the taxpayer's workpapers. Check for coal sales which may be excluded or exempted by the taxpayer.

4. Taxpayer must substantiate that FET had previously been paid on any excluded sales of riverbed coal.

5. Note: Black lung taxes did not commence until March 31, 1978. Therefore, any coal in place prior to 1978 could not have been previously taxed.

ISSUE 10 -- REFUSE PILE COAL

Issue

Is a person who extracts coal from a coal refuse pile subject to IRC section 4121?

Explanation

IRC section 4121(a)(1) and Treas. Reg. section 48.4121-1(a)(1) include, as a producer subject to coal tax, any person who extracts coal from coal waste refuse piles and/or from silt waste products which resulted from the wet washing of coal. Extraction includes reclaiming the coal through further processing. Sales of an unprocessed refuse pile is not "production" however, and hence, not taxable.

Law

1. Treas. Reg. section 48.4121-1(a)(1).

   The term "producer" includes any person who extracts coal from coal waste refuse piles or from the silt waste product which results from the wet washing (or similar processing) of coal. However, the excise tax does not apply to a producer who sells the silt waste product without extracting coal from it.

2. ***Darrell Davis d/b/a Davis Enterprises and Midwest Coal Corporation of America v. United States***, 92-2 U.S.T.C. 70,020; 972 F.2d 869 (7th Cir. 1992)

   The Court found that a company which extracted coal from the silt waste product as a result of the washing of coal was a producer and subject to the coal excise tax.

Techniques

1. Ask the taxpayer if any coal from waste piles are being reclaimed or recovered.

2. Look for waste piles during the inspection of premises.

3. Inspect records for identification of coal sources.

4. Reconcile coal sales to the taxpayer's workpapers. Check for coal sales which may be excluded or exempted by the taxpayer.

5. Ensure that the taxpayer's extraction methods do not constitute "further

processing". If their processing can be classified as reclamation of coal, it would result in the "waste" coal being taxed.

ISSUE 11 -- THERMO-DRYER COAL

Issue

Is coal used by a producer in a thermal-dryer to dry the producer's own coal subject to the IRC section 4121 tax?

Explanation

IRC section 4121 taxes coal producers on coal they mine and sell. Under Treas. Reg. section 48.4121-1(a)(1), the "use" of coal by a producer is a taxable event. Treas. Reg. section 48.4121-(1)-(d)(3) further defines the term "coal used by a producer" to mean use by a producer in other than a "mining process." Pursuant to recent court decisions, the Service does not consider coal mined by the taxpayer and used in their dryer to dry their own coal, to be coal subject to FET.

Law

1. ***Mulga Coal Company, Inc. v. United States of America***, 825 F.2d 1547 (11th Cir. 1987).

   The taxpayer was engaged in the underground mining of coal, and washed and dried the coal it sold to utility companies. The court determined that the taxpayer's use of coal in dryer equipment to dry its own coal was "the use" of coal by a producer in the mining process and not subject to the black lung tax. The taxpayer argued that because the drying of coal is a "mining process" for purposes of percentage depletion under IRC section 613(c)(4)(A), the coal used as a fuel to dry its own coal should not be taxed under IRC section 4121.

   Mulga Coal Co. Inc. v. United States of America, action on decision, 1994-02 (July 19, 1993).

   IRS will follow conclusion reached in ***Mulga Coal Co., Inc.*** Accordingly, coal that is used to provide heat for drying will be excluded from taxation.

2. ***Consolidation Coal Company / USX Corporation / U.S. Steel Mining v. United States***, Civil Action No. 88-1604/89-1051/90-1890, 880 F. Supp. 405 (W.D. Penn. 1992).

   The Court determined that coal used as a fuel to dry coal that is also produced for sale is "used in a mining process" and therefore, is not subject to Black Lung Benefit Trust tax under IRC section 4121. See ***Action on Decision***, 1994-02, ***supra***.

3. ***Island Creek Coal Company v. United States***, U.S. District Court, Eastern District of Kentucky, Lexington Division, 91-2 U.S.T.C. 70,012, (E.D. Ky. 1991).

   The District Court adopted and applied Mulga Coal and ordered a tax refund to the taxpayers who used coal as a fuel for drying their own coal. See ***Action on Decision*** 1994-02, ***supra***.

Techniques

1. Ask the taxpayer if he or she dries his or her own coal or coal owned by others.

2. Ask what fuel is used to dry coal (electric, diesel, coal).

3. If the taxpayer is using coal to fuel his or her dryers, determine if he or she is using his or her own coal. Inspect production records and workpapers to determine if the taxpayer is reducing his or her taxable production by this "dryer coal."

4. Ask if the taxpayer is using his or her own coal to fuel dryers when drying coal other than his or her own. Coal used to dry the coal for others is not exempt from FET.

5. Although coal used in a dryer may not be subject to FET, the agent should be aware that this same coal should not be included in the taxpayer's calculation for depletion.

ISSUE 12 -- CLAIM FOR REFUND

Issue

Can a producer of coal subject to IRC section 4121 file a claim to recover an

overpayment of FET?

Explanation

Coal producers subject to IRC section 4121 can file a claim provided that they comply with IRC section 6416 which requires that they:

1. Have not included the tax in the price of the coal and have not collected the tax from the buyer

2. Have repaid the amount of the tax to the ultimate purchaser of the article

3. Have filed with the Secretary a written consent from the ultimate purchaser allowing the coal producer credit or refund of FET previously paid.

Law

1. IRC section 6416(a)(1).

   No credit or refund of any overpayment of tax imposed by Chapter 31 (relating to retail excise taxes) or Chapter 32 (manufacture taxes) shall be allowed or made unless the person who paid the tax established, under Treasury Regulations prescribed by the Secretary that he (A) has not included the tax in the price of the article, with respect to which it was imposed and has not collected the amount of the tax from the person who purchased such article; (B) or having collected the tax they have repaid the amount of the tax to the ultimate purchaser of the article; (C) or in the case of an overpayment, has obtained the written consent of such ultimate vendor to the allowance of the credit or making of the refund.

2. ***Riviera Manufacturing Co., Inc. v. United States,*** 307 F.Supp. 916 (D. Colo. 1969), ***aff'd.*** 440 F.2d 780 (1971).

   The District Court ruled that the claimant must prove that the excess tax was not passed on to ultimate consumer when making a claim for excess taxes. They cited the need for clear and decisive evidence that the tax has been borne by them and not passed on in the form of manufacturing cost.

3. ***Gordag Industries, Inc. v. United Sates***, 63-2 U.S.T.C. 15,532 (D.Minn. 1963)

   The District Court denied the taxpayer's request for refund citing its failure to establish that tax was not passed on to customers. The taxpayer had not filed written consent nor did they convince the Court that the tax was not included in

the price of the object or collected from the purchasers.

Discussion

The Service should not permit claims for refund unless the taxpayer satisfies the requirements of IRC sections 6416(a)(1)(A) through (D). These Code sections state that, in order to receive a refund of retail and manufacturers excise tax, the taxpayer must have born the burden of the tax. For example, an examiner working claims for refunds of black lung excise tax must not only verify that the claim amount is correct, but must also make certain that the taxpayer meets the requirements for refund per IRC section 6416.

Chapter 3

GENERAL AUDIT TECHNIQUES

1. Reconcile Form 720 return to taxpayer's worksheet. If tax is reported under abstracts 37 or 39, ask how tax was calculated to determine if tax was calculated correctly under the manufacturer's excise tax guidelines.

2. If state severance tax returns are required, reconcile the Form 720 to state returns.

3. Reconcile the Form 720 to the Office of Surface Mining (OSM) quarterly returns.

4. The tax is to be calculated on a load-by-load basis. Documentation should be available stating the rate paid for each load delivered to the purchaser; average sales price calculations are not acceptable.

5. Reconcile the monthly sales journal to the sales invoice worksheet. The sales invoice worksheet should be supported by delivery tickets which support the number of tons delivered. A remittance advice should be available which details the loads being paid for by the purchaser.

6. Reconcile weekly production reports to the sales journal. Weekly production reports should show the tonnage reported from each mine.

7. If coal is purchased, and thus not subject to tax because the tax was supposedly paid by the producer, review the canceled checks to support the purchases. Obtain the EIN, name, and address of the company from whom the coal was purchased and review their transcript to ensure that the other company has filed a Form 720.

8. Taxpayers often mine someone else's mineral rights for which royalties are paid. Ask to see mineral right agreements to determine if royalties are payable; how royalties are calculated; and to whom royalties are paid. Some agreements call for a minimum annual payment or a set rate per ton. Royalties per the agreements should be reflected on the income tax return; if not, why not.

9. Ask how many seams are being mined; how many mines are being operated; how many miners employed; how many shifts are run?

10. How is coal transported? Transportation costs to the buyer may be deductible.

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Chapter 4

SAMPLE INFORMATION DOCUMENT REQUESTS (Form 4564)

Following are two samples of information document request.

NON-CEP QUESTIONS

1. Retained copy of Form 720 (for quarter under audit) with supporting workpapers showing how tax was calculated.

2. Copy of your Federal Income Tax return Form 1120S, 1120, 1065, or 1040 for (prior, subsequent, year of Form 720 under examination) for inspection.

3. Copies of Forms 941, 940, W-2, 2290, 8300, and 1099 for periods during (year of Form 720 under examination, to present) available for inspection. Copies of Form W-4 for all employees for the most current year.

4. Retained copies of Forms 720 for period beginning (date) and ending (date) for inspection.

5. Copies of OSM, MSHA, and state production reports (for example, Department Environment Resources, severance tax, reclamation returns) for the period _____.

6. Copies of Federal audit reports for prior examinations of your income and/or excise tax returns within the last three (3) years.

7. Copies of audit reports reflecting examinations by OSM and/or state agencies within the last three (3) years.

8. Purchase journals and invoices evidencing all coal purchases during _____.

9. Sales, accounts receivable, cash receipts journals, and general ledger detailing all coal sales during _____.

10. Copies of contract mining agreements, purchase coal agreements and royalty contracts during _____.

11. Information regarding related party sales; for example, related corporations, partnerships, and sole proprietorships.

12. If gross production includes lignite, indicate quantity mined and sold during the audit period.

13. A list of types of off-road and on-road equipment using diesel fuel and/or special motor fuels.

14. Purchase journals and invoices for diesel fuel acquired tax-free, if applicable. Also, records on company use of such fuel.

CEP QUESTIONS

1. Was a Federal Excise Tax Return, Form 720, filed by you for any quarterly periods in the years 1991 or 1992? yes/no

2. Was a Federal Highway Use Tax Return, Form 2290, filed by you for any 1991 or 1992 period? yes/no

   If the answer to question 1 or 2 was yes, please provide me with a copy of all Forms 720 or 2290 filed in 1991 and 1992.

3. For the years 1991 and 1992, did you maintain bulk diesel fuel, fuel oil, or heating oil tanks for any of the following:

   a. Highway type vehicles (trucks, tractors): yes/no
   b. Heating: yes/no
   c. Off-highway equipment (bulldozers etc.): yes/no
   d. River vessels: yes/no
   e. Other: (Please list other equipment) yes/no

4. a) Do you have a foreign insurance company (outside the United States) insuring domestic property or life? yes/no

   b) Do you have a captive foreign insurance company? yes/no

5. Do you either own or lease highway vehicles with a gross vehicle weight of over 55,000 pounds? yes/no

   If yes, please complete the following schedule:

Description of vehicle	Gross Vehicle Weight	Vehicle first put into use
1990 Mack Tractor* (*example)	73,000 lbs.*	March 1990*

6. Did you, during 1991 and 1992, import into the United States any highway truck with a gross vehicle weight of over 33,000 lbs, trailer with a gross vehicle weight of over 26,000 lbs. or highway type tractor? yes/no

7. Did you import or manufacture any of the following during 1991 and 1992?

Aircraft:	yes/no
Boats:	yes/no
Passenger vehicles:	yes/no
Furs:	yes/no
Jewelry:	yes/no
Sports fishing equipment:	yes/no
Electric outboard motors or sonar devices:	yes/no
Bows or arrows:	yes/no
Trucks with gross vehicle weights over 33,000 lbs.:	yes/no
Trailers with gross vehicle weights over 26,000 lbs.:	yes/no
Highway Tractors:	yes/no

8. Did you mine coal or have a contract miner mine coal for you during 1991 or 1992? yes/no

9. During 1991 or 1992, did you either produce or import any of the following chemicals? (circle yes responses)

acetylene	antimony	cobalt
benzene	antimony trioxide	cupric sulfate
butane	arsenic	cupric oxide
butylene	arsenic trioxide	cuprous oxide
butadiene	barium sulfide	hydrochloric acid
ethylene	bromide	hydrogen fluoride
methane	cadmium	lead oxide

naphthalene	chlorine	mercury
propylene	chromium	nickel
toluene	chromite	phosphorus
xylene	potassium dichromate	stannous chloride
ammonia	sodium dichromate	stannic chloride
zinc chloride	zinc sulfate	potassium hydroxide
sodium hydroxide	sulfuric acid	nitric acid

If yes, please provide quantity of each chemical produced or imported.

10. During 1991 or 1992, did you import into the U.S. any of the following chemical substances? (circle yes responses)

cumene	nickel waste and scrap
styrene	wrought nickel rods & wire
ammonium nitrate	nickel powders
nickel oxide	phenolic resins
isopropyl alcohol	polyvinyl chloride resins
ethylene glycol	polystyrene resins and copolymers
vinyl chloride	ethyl alcohol
polyethylene resins, total	ethyl benzene
polybutadiene	methylene chloride
styrene-butadiene, latex	polypropylene
styrene-butadiene, SNPF	propylene glycol
synthetic rubber	formaldehyde
urea	acetone
ferronickel	acylonitrile
ferrochromium	methanol
ferrochrome	propylene oxide
unwrought nickel	polypropylene resins
ethylene oxide	carbon tetrachloride
ethylene dichloride	chromic acid
cyclohexane	hydrogen peroxide
isophthalic acid	polystyrene homopolymer resins
maleic anhydride	melamine
phthalic anhydride	acrylic and methacrylic acid resins
ethyl methyl ketone	vinyl resins
chloroform	vinyl resins, NSPF

If so, please provide quantity of each substance imported.

11. During 1991 or 1992, did you import or produce any of the following ozone depleting chemicals? (circle yes responses)

CFC-11	trichlorofluoromethane
CFC-12	dichlorofluoromethane
CFC-113	trichlorotrifluoroethane
CFC-114	1,2-dichloro-1,1,2,2,-tetrafluoroethane
CFC-115	chloropentafluoroethane
halon-1211	bromochlorodofluoromethane

halon-1301	bromotrifluoromethane
halon 2402	dibromotetrafluoroethane

If so, please provide quantity of each chemical imported or produced.

12. During January of 1991 or 1992, did you hold in inventory any of the following ozone depleting chemicals outlined in question 11? yes/no

    If so, please provide quantity of each chemical in inventory.

13. Did you operate a vessel on any river in the United States in 1991 or 1992? yes/no

14. Do you own or operate a railroad or locomotive that runs on rails? yes/no

    If so, please provide a copy of one invoice from each of your diesel fuel suppliers.

15. Do you own an aircraft that has a take-off weight of over 6,000 lbs.? yes/no

    If so, is the aircraft:
    a. Used exclusively by _____ and subsidiaries.
    b. Leased out to unrelated parties on a wet type lease:
    c. Used by unrelated parties for a fee:

16. During 1991 or 1992, did you purchase propane for use in highway motor vehicles? yes/no

17. During 1991 or 1992 did you provide any communication service (local telephone service, tool telephone service, or, teletypewriter exchange service) to anyone where you charged a fee?

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Chapter 5

THIRD PARTY SOURCE DOCUMENTS

1. State Directory of Mines

    a. Operator Index reflects brief history of operator

    a. Permit Number and description of mine activity.

2. State DER Annual Production Report

    a. Find Operator's name and county codes showing location of permits

    b. Cross reference county codes to reference list

    c. Find production per county.

3. OSM Alpha Listing (report # 7570)

    a. Find Operator

    b. Find Mine-ID Number.

4. OSM Annual Tonnage Report (report # 7487)

    a. Using Mine-ID #, find operator

    b. Find reported production for quarters shown on the top of the report.

5. MSHA Quarterly Production Report (report # 7350)

    a. Using Mine-ID #, find operator

    b. Find production reported to MSHA.

6. OSM/MSHA Tonnage Comparison Report (report # 7340)

    a. Using Mine-ID #, find operator

b. Find variance between OSM & MSHA reported tonnage.

7. OSM Regular versus Reduced Tonnage and Fee Comparison (report # 7830)

a. Using Mine-ID #, find operator

b. Find reported production per permit site

c. Find excess moisture reported to OSM.

8. State Public Utility Commission (PUC) Annual Report

a. PUC may require utility companies to file an annual report listing their coal suppliers which sold them more than 10,000 tons during the year.

b. The report typically shows coal company's name, type of coal, tons purchased, base price paid, freight/handling costs, and cost per ton.

9. OSM Audit Report -- available per IRS/OSM agreement.

10. Federal Energy Regulatory Commission (FERC) Annual Report
The report shows a summary of (8) above for all states.

Appendix I

GLOSSARY OF MINING TERMS

There are many technical terms associated with the mining industry. Below are terms that, while not necessarily used or discussed in this text, are commonly encountered when examining mining entities or activities. The following definitions are taken from "Dictionary of Mining Terms."

- A -

Abandoned Mine -- Excavations, either caved or sealed, that are deserted and in which further mining is not intended.

Acid Mine Drainage -- Liquid drainage from bituminous coal mines containing a high concentration of acidic sulfates, especially ferrous sulfate.

Adit -- A horizontal opening giving access to a mine.

Advance Stripping -- The removal of barren or sub-grade earthy or rock materials required to expose and permit the minable grade of ore to be mined.

AFE -- Authorization For Expenditure.

Air Shaft -- A shaft used wholly or mainly for ventilating mines, for bringing fresh air to places where men are working, or for exhausting used air.

Airway -- Any underground gallery or passage through which a portion of the ventilation passes, that is, the air is carried. Sometimes referred to as an air course. Also called wind road.

Anode -- The positive terminal of an electrolytic cell. Opposite of cathode.

Anthracite -- A hard, black lustrous coal containing a high percentage of fixed carbon and a low percentage of volatile matter. Commonly referred to as hard coal. Anthracite ignites with difficulty, produces no smoke, burns at first with a very short blue flame that disappears after the coal is thoroughly ignited, and produces an intensely hot fire.

Ash -- The inorganic residue remaining after ignition of combustible substances. In general, it differs in weight and composition from the original mineral matter.

Auger Mining -- A mining method often used by strip-mine operators when the overburden gets too thick to be removed economically. Large-diameter, spaced holes are drilled up to 200 feet into the coal bed by an auger. Like a bit used for boring holes in wood, this consists of a cutting head with screw like extensions. As the auger turns, the head breaks the coal and the screw carries the coal back into the open and dumps it on an elevating conveyor; this, in turn, carries the coal to an overhead bin or loads it directly into a truck. Auger mining is relatively inexpensive, and it is reported to recover 60 to 65 percent of the coal in the part of the bed where it is used.

- B -

Backfill -- The process of filling, and/or the material used to fill, a mine opening. In general, refers to the material placed "back" to refill an excavation.

Ballast -- Rough, unscreened gravel as used to form the bed of a railway or substratum for new roads.

Barren Solution -- A solution from which all possible valuable constituents have been removed.

Bed -- The smallest division of stratified layers marked by more or less well-defined divisional planes.

Belt Conveyors -- A moving endless belt that rides on rollers and on which coal or other materials can be carried for various distances.

Belt Feeders -- Short loop of conveyor belt, or articulated steel plate, used to draw ore at a regulated rate from under a bin or stockpile.

Belting -- One of the main parts of a belt conveyor. The belting consists of plies of cotton duck impregnated with rubber, and with top and bottom covers of rubber. The carrying capacity of the belt will vary depending on the running speed and the width of the belt.

Bench -- The horizontal step or floor along which coal, ore, stone, or overburden is worked or quarried. In tunnel excavation, where a top heading is driven, the bench is the mass of rock left, extending from about the spring line to the bottom of the tunnel.

Beneficiation -- The processing of ores to regulate the size of a desired product, remove unwanted constituents, and improve the quality, purity, or assay grade of a desired product. Concentration or other preparation of ore for smelting by drying, flotation, or magnetic separation.

Bituminous Coal -- A coal which is high in carbonaceous matter, having between 15 and 50 percent volatile matter. Also known as soft coal.

Blast -- The operation of blasting, or rending rock or earth by means of explosives.

Block Coal -- A bituminous coal that breaks into large lumps or cubical blocks; also, coal passing over certain sized screens instead of through them, such as a 5-, 6-, and 8-inch block.

Blower -- A fan employed in forcing air either into a mine or into one portion of a mine.

Blunging -- The wet process of blending, or suspending, ceramic material in liquid by agitation.

Bone Coal -- Coal with a high ash content, almost rock.

Box Cut -- In surface mining, the initial cut driven in a property, where no open side exists; this results in a high wall on both sides of the cut.

Brattice -- A board of plank lining, or other partition, in any mine passage to confine the air and force it into the working places. Its object is to keep the intake air from finding its way by a short route into the return airway.

Brattice Cloth -- Fire-resistant canvas or duck used to erect a brattice.

Briquet -- A block of compressed coal dust, used as fuel; also, a slab or block of artificial stone.

British Thermal Unit (BTU) -- The amount of heat needed to raise 1 pound of water 1 degree F (equal to 252 calories). Symbol, Btu.

Brown Coal -- A low-rank coal which is brown, brownish-black, but rarely black. It commonly retains the structures of the original wood. It is high in moisture, low in heat value, and checks badly upon drying.

Bucket -- A vessel (as a tub or scoop) for hoisting and conveying material (as coal, ore, grain, gravel, mud, or concrete). A part of an excavator that digs, lifts, and carries dirt.

Bug Dust -- Fine coal or rock material resulting from dry boring, drilling, or the use of other cutting machines in underground work places.

Buggy -- A small wagon or truck used for short transportation of heavy materials (as coal in a mine or ingots in a steel mill).

Bulldozer (Dozer) -- A highly versatile piece of earth excavating and moving equipment especially useful in land clearing and leveling work, in stripping topsoil, in road building and ramp building and in floor or bench cleanup and gathering operations.

By-product -- A secondary or additional product; for example, the more common byproducts of coal ovens are gas, tar, benzol, and ammonium sulfate.

- C -

Cap Lamp -- The lamp which a miner wears on his safety hat or cap. For illumination only.

Captive Mine -- A mine which produces coal or mineral for use by the same company.

Cathode -- The electrode where electrons enter (current leaves) an operating system, such as a battery, an electrolytic cell, an X-ray tube, or a vacuum tube. Opposite of anode.

Cinder Blocks -- A block closing the front of a blast furnace and containing the cinder notch.

Coal -- A solid, brittle, more or less distinctly stratified, combustible carbonaceous rock, formed by partial to complete decomposition of vegetation; varies in color from dark brown to black; not fusible without decomposition and very insoluble. The boundary line between peat and coal is hazy (see brown coal) as is the boundary line between coal and graphite and the boundary line between carbonaceous rock and coal. In the formation of coal, the vegetable matter appears to have been very largely moss and other low forms of plants, but in places, coal contains much wood; the vegetal matter seems to have first taken the form of peat, then lignite, and then bituminous coal. The latter by the loss of its bitumen has in some places been converted into anthracite (hard coal) and finally into graphite.

Coal Fields -- An area of country, the underlying rocks of which contain workable coal seams.

Coal Gas -- Flammable gas derived from coal either naturally in place, or by induced methods of industrial plants and underground gasification.

Coal Seam -- A bed or stratum of coal.

Coal Tar -- Tar obtained by the destructive distillation of bituminous coal, usually in coke ovens or in retorts and consisting of numerous constituents (as benzene, xylenes, naphthalene, pyridine, quinoline, phenol, cresols, light oil, and creosote) that may be obtained by distillation.

Coke -- Bituminous coal from which the volatile constituents have been driven off by heat, so that the fixed carbon and the ash are fused together.

Coke Breeze -- The fine screenings from crushed coke or from coke as taken from the ovens, of a size varied in local practice but usually passing a ½-inch or 3/4-inch screen opening.

Colliery -- A whole coal mining plant, generally used in connection with anthracite mining but sometimes used to designate the mine, shops, and preparation plant of a bituminous operation.

Concentration -- The process of increasing the dissolved solids per unit volume of solution, usually by evaporation of the liquid; the quantity of solute dissolved in a unit volume of solution.

Continuous Mining -- Mining in which the continuous mining machine cuts or rips coal from the face and loads it onto conveyors or into shuttle cars in a continuous operation. Thus, the drilling and shooting operations are eliminated, along with the necessity for working several headings in order to have available a heading in which loading can be in progress at all times. The longwall machine and conveyor are in the same track which is situated between the last row of props and the face. The conveyor is moved forward progressively as the coal is cut and loaded by the machine. There are no separate or cyclic operations as in conventional machine mining and the aim is to make each shift a continuation of the previous shift. Where the conditions are favorable, faces up to 250 yards in length may be so worked.

Conventional Mining -- The cycle of operations which includes cutting the coal, drilling the shot holes, charging and shooting the holes, loading the broken coal, and installing roof support. Also known as cyclic mining.

Conveyor -- A mechanical contrivance generally electrically driven, which extends from a receiving point to a discharge point and conveys, transports, or transfers material between those points.

Core Drill -- A drilling machine equipped with a hollow bit (core bit) and a core barrel which by rotation cuts out and recovers a rock core sample. A drill that removes a cylindrical core from the drill hole.

Cropline -- A line following the outcrop.

Crosscut -- A small passageway driven at right angles to the main entry to connect it with a parallel entry or air course.

Crusher -- A machine for crushing rock or other materials. Among the various types of crushers are the ball-mill, gyratory crusher, Hadsel mill, hammer mill, jaw crusher, rod mill, rolls, stamp mill, and tube mill.

Crushing -- Reducing ore or quartz by stamps, crushers, or rolls.

Crystallization -- The formation of mineral crystals during the cooling of a magma or by precipitation from a solution.

Cut -- In development work, the term cut refers to the location and direction of holes blasted first to provide a free face to which other holes may break. For example, draw cut, horizontal cut, pyramid cut, burned cut, etc.

Cutting Machine -- A power-driven machine used to undercut or shear the coal to facilitate its removal from the face.

- D -

Deep Mining -- The exploitation of coal or mineral deposits at depths exceeding about 3,000 feet. Also known as underground mining.

Dragline -- A type of excavating equipment which casts a rope-hung bucket a considerable distance, collects the dug material by pulling the bucket toward itself on the ground with a second rope, elevates the bucket, and dumps the material on a spoil bank, in a hopper, or on a pile.

Dredging -- The removal of soils from under water, using the water as a means of transportation to convey the soils to final positions.

Drift -- A horizontal underground passage. A drift follows the vein rather than intersect it like a crosscut.

Drill -- Any cutting tool or form of apparatus using energy in any one of several forms to produce a circular hole in rock, metal, wood, or other material.

Duckbill -- The name given to a shaking-type combination loading and conveying device, so named from the shape of its loading end and which generally receives its motion from the shaking conveyor to which it is attached.

- E -

Empties -- Empty mine or railroad cars. Empty railroad cars are called "flats" in Arkansas.

Escapeway -- An opening through which the miners may leave the mine if the ordinary exit is obstructed.

Exhaust Fan -- A fan which sucks used air from a mine and thereby causes fresh air to enter by separate entries to repeat the cycle.

- F -

Face -- A working place from which coal or mineral is extracted. The exposed surface of coal or other mineral deposit in the working place where mining, winning, or getting is proceeding.

Fault -- A break in the continuity of a body of rock. It is accompanied by a movement on one side of the break or the other so that what were once parts of one continuous rock stratum or vein are now separated.

Fines -- In general, the smallest particles of coal or mineral in any classification, process, or sample of the run-of-mine material.

Fire -- To blast with gunpowder or other explosives. A word shouted by miners to warn one another when a shot is fired.

Fire Boss -- A person designated to examine the mine for gas and other dangers. In certain states, the fire boss is designated as the mine examiner.

Floor -- The rock underlying a stratified or nearly horizontal deposit, corresponding to the foot wall of more steeply dipping deposits. A horizontal, flat ore body.

Flotation -- The method of mineral separation in which a froth created in water by a variety of reagents floats some finely crushed minerals to the surface and other minerals sink.

Fluidity (Plasticity) -- In mineral transport, term not confined to liquids and slurries, but also used for finely divided solids which flow readily in air currents, fluosolids reactors, or through dry ball mills.

Freeze Dried Additives -- Chemicals added to the coal to prevent freezing during shipping.

Front End Loader -- A tractor loader with a digging bucket mounted and operated at the front end of the tractor. A tractor loader that both digs and dumps in front.

- G -

Gassy -- A coal mine is rated gassy by the U.S. Bureau of Mines if an ignition occurs or if a methane content exceeding 0.25 percent can be detected, and work must be halted if the methane exceeds 1.5 percent in a return airway.

Gather -- To assemble loaded cars from several production points and deliver them to main haulage for transport to the surface or pit bottom.

Gathering Locomotive -- A lightweight type of electric locomotive used to haul loaded cars from the working places to the main haulage road, and to replace them with empties.

Gob -- To store underground, as along one side of a working place, the rock and refuse encountered in mining. The material so packed or stored underground. The space left by the extraction of a coal seam into which waste is packed. Also called goaf.

Gob Pile -- A pile or heap of mine refuse on the surface. An accumulation of waste material such as rock or bone.

Gross Ton -- The long ton of 2,240 avoirdupois pounds.

Ground Water -- Water at, and below, the water table; basal or bottom water; phreatic water. Used also in a broad sense to mean all water below the ground surface. Water derived from wells or springs, not surface water from lakes or streams.

Gunite -- A mixture of sand and cement, sprayed with a pressure gun onto roofs and ribs to act as a sealing agent to prevent erosion by air and moisture.

- H -

Haulage -- The drawing or conveying, in cars or otherwise, or movement of men, supplies, ore and waste both underground and on the surface.

Haulageway -- The gangway, entry, or tunnel through which loaded or empty mine cars are hauled by animal or mechanical power.

Head House -- A covered timber framing at the top of a shaft, into which the shaft guides are continued that carry the cage or elevator. The term is sometimes applied to the structure containing the hoisting engine, boilers, and other machinery, in addition to the actual hoisting cage, etc.

Heap Leaching -- A process used for the recovery of copper from weathered ore and material from mine dumps. This process can also be applied to the sodium sulfide leaching of mercury ores.

Highwall -- The unexcavated face of exposed overburden and coal or ore in an opencast mine or the face or bank on the uphill side of a contour strip mine excavation.

Hoist -- A power-driven windlass for raising ore, rock or other material from a mine and for lowering or raising men and material. Also called hoister.

- I -

In Situ -- In the natural or original position. Applied to a rock, soil, or fossil when occurring in the situation in which it was originally formed or deposited.

- J -

Jig -- A machine in which the feed is stratified in water by means of a pulsating motion and from which the stratified products are separately removed, the pulsating motion being usually obtained by alternate upward and downward currents of the water. Also called washbox.

- K -

Kerf -- Undercut in a coal seam from 3 to 7 inches thick and entering the face to a depth of up to 4 feet, made by a mechanical cutter. Also called kirve.

- L -

Lamp-House -- A room or building at the surface of a mine, provided for charging, servicing, and issuing all cap, hand, and flame safety lamps held at the mine.

Layout -- The design or pattern of the main roadway and workings.

Leaching -- Extracting a soluble metallic compound from an ore by dissolving it in a solvent, such as water, sulfuric acid, etc. and then recovering the metal by precipitation.

Lignite -- A brownish-black coal in which the alteration of vegetal material has proceeded further than in peat but not so far as subbituminous coal.

Liquid Oxygen Explosive (LOX) -- Sawdust or other suitable material, formed into cartridges and dipped into liquid oxygen before use in blasting.

Loader -- A mechanical shovel or other machine for loading coal, ore, mineral, or rock.

Loading Machine -- A machine for loading materials such as coal, ore, or rock into cars or other means of conveyance for transportation to the surface of the mine.

Loading Ramp -- A surface structure, often incorporating storage bins, used for gravity loading bulk material into transport vehicles.

Locomotive -- An electric engine, either operating from current supplied from trolley and track or from storage batteries carried on the locomotive.

Longwall -- The coal seam is removed in one operation by means of a long working face or wall, thus the name. The workings advance (or retreat) in a continuous line which may be several hundreds of yards in length. The space from which the coal has been removed (the gob, goaf, or waste) is either allowed to collapse (caving) or is completely or partially filled or stowed with stone and debris. The stowing material is obtained from any dirt in the seam and from the ripping operations on the roadways to gain height. Stowing material is sometimes brought down from the surface and packed by hand or by mechanical means.

Low Coal -- Coal occurring in a thin seam or bed.

Lump Coal -- Bituminous coal in the large lumps remaining after a single screening that is often designated by the size of the mesh over which it passes and by which the minimum size lump is determined. Also, the largest marketable size.

- M -

Man Car -- A kind of car for transporting miners up and down the steeply inclined shafts of some mines, as at Lake Superior.

Man Trip -- A trip made by mine cars and locomotives to take men rather than coal, to and from the working places.

Marsh Gas -- Methane gas. If the decaying matter at the bottom of a marsh or pond is stirred, bubbles of methane rise to the surface, thus the name marsh gas.

Methane -- Formed by the decomposition of organic matter, it is the most common gas found in coal mines. It is a tasteless, colorless, nonpoisonous, and odorless gas; in mines the presence of impurities may give it a peculiar smell.

Methane Monitor -- A system whereby the methane content of the mine air is indicated automatically at all times, and when the content reaches a predetermined concentration the electric power is cut off automatically from each machine in the affected area. The mechanism is so devised that its setting cannot be altered. The system is used, mainly, in conjunction with the operation of continuous miners and power loaders.

Metric Ton -- A unit of mass and weight that equals 1,000 kilograms or 2,204.6 avoirdupois pounds; abbreviation, MT.

Middlings -- That part of the product of a washery, concentration, or preparation plant which is neither clean coal nor mineral nor reject (tailings). It consists of fragments of coal and shale or mineral and gangue. The material is often sent back for crushing and retreatment.

Mine Car -- Cars which are loaded at production points and hauled to the pit bottom or surface in a train by locomotives or other power. They vary in capacity from 1 to 12 tons, and are either of wood or steel construction or combinations of both.

Mine Foreman -- The person charged with the responsibility of the general supervision of the underground workings of a mine and the persons employed therein. In certain states, the mine foreman is designated as the mine manager.

Mine Inspector -- One who checks mines to determine the safety condition of working areas, equipment, ventilation, and electricity, and to detect fire and dust hazards.

Miner -- One who mines; as (1) one engaged in the business or occupation of getting ore, coal, precious substances, or other natural substances out of the earth; (2) a machine for automatic mining (as of coal); and (3) a worker on the construction of underground tunnels and shafts (as for roads, railways, waterways).

Mineral -- In a broad nontechnical sense, the term embraces all inorganic and organic substances hat are extracted from the earth for use by man. A substance occurring in nature which has a definite or characteristic range of chemical composition, and distinctive physical properties or molecular structure. With few exceptions, such as opal and mercury, minerals are crystalline solids.

Mineral Rights -- The ownership of the minerals under a given surface, with the right to enter thereon, mine, and remove them. It may be separated from the surface ownership, but, if not so separated by distinct conveyance, the latter includes it.

Mine Run -- The product of the mines before being sized and cleaned.

Mouth -- An opening resembling or likened to a mouth, as one affording entrance or exit to a mine.

Muck -- Unconsolidated soils, sand, clays, loams encountered in surface mining; generally, earth which can be severed and moved without preliminary blasting. Useless material; earth or rock which may or may not be mixed with coal or minerals.

Multiple-Seam Mining -- Mining two or more seams of coal, frequently close together, that can be mined profitably where mining one alone would not be profitable.

- N -

Nonmetal -- A chemical element that is not classed as a metal because it does not exhibit most of the typical metallic properties. An element that, in general, is characterized chemically by the ability to form anions, acidic oxides and acids, and stable compounds with hydrogen.

- O -

Open-Cut (Pit) Mining -- A form of operation designed to extract minerals that lie near the surface. Waste, or overburden, is first removed, and the mineral is broken and loaded, as in a stone quarry. Important chiefly in the mining of ores of iron and copper. The mining of metalliferous ores by surface-mining methods is commonly designated as "open-pit mining" as distinguished from the "strip mining" of coal and the "quarrying" of other nonmetallic materials such as limestone, building stone, etc.

Opening -- A short heading driven between two or more parallel headings or levels for ventilation.

Outcrop -- A term used in connection with a vein or lode as an essential part of the definition of apex. It does not necessarily imply the visible presentation of the mineral on the surface of the earth, but includes those deposits that are so near to the surface as to be found easily by digging.

Overburden -- Used by geologists and engineers in several different senses. By some, it is used to designate material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal, especially those deposits that are mined from the surface by open cuts. By others, overburden designates only loose soil, sand, gravel, etc., that lies above the bedrock. The term should not be used without specific definition. Also called burden, cover, drift, mantle, surface.

Overriding Royalty -- The term applied to a royalty reserved in a sublease or assignment over and above that reserved in the original lease.

- P -

Panel -- System of coal extraction in which the ground is laid off in separate districts or panels, pillars of extra size being left between.

Parting -- A natural, usually smooth, separation between strata.

Peat -- There are two types of peat, low moor (Flachmoor) and high moor (Hochmoor) peat. Low moor peat is the most common starting material in coal genesis. It therefore constitutes a caustobiolith of low diagenetic degree. Peat is formed in marshes and swamps from the dead, and partly decomposed remains of the marsh vegetation. Stagnant ground water is necessary for peat formation to protect the residual plant material from decay. Peat has a yellowish brown to brownish black color, is generally of the fibrous consistency, and can be either plastic or friable; in its natural state it can

be cut; further, it has a very high moisture content (above 75 percent, generally above 90 percent). It can be distinguished from brown coal by the fact that the greater part of its moisture content can be squeezed out by pressure (for example, in the hand). Peat also contains more plant material in a reasonably good state of preservation than brown coal.

Pillar -- An area of coal or ore left to support the overlying strata or hanging-wall in a mine. Pillars are sometimes left permanently to support surface works or against old workings containing water. Coal pillars, such as those in pillar-and-stall mining, are extracted at a later period.

Pit -- Any mine, quarry, or excavation area worked by the open-cut method to obtain material of value.

Pit Committee -- A joint committee of employer and workers dealing with the labor problems of a mine.

Place -- The part of a mine in which a miner works by contract is known as his "place" or "working place." A point at which the cutting of coal is being carried on.

Portal -- Any entrance to a mine. The rock face at which tunnel driving is started. Also called point of attack. A nearly level opening into a tunnel. The surface entrance to a drift, tunnel, adit, or entry.

Portal to Portal -- A term now frequently encountered in disputes over what constitutes compensable "working time" under Federal laws. Portal literally means "entrance" and, in underground coal mining, portal refers to mine mouth or entry at surface. Hence, portal-to-portal as a descriptive term means strictly elapsed time from entry through the portal to exit on return.

Post -- A mine timber, or any upright timber, but more commonly used to refer to the uprights which support the roof cross-pieces. Commonly used in metal mines instead of leg which is the coal miner's term, especially in the Far West regions of the United States. The support fastened between the roof and floor of a coal seam used with certain types of mining machines or augers. A pillar of coal or ore.

Powdered Coal (Pulverized Coal) -- Coal that has been crushed to a fine dust by grinding mills. The latter are often air swept, the velocity of the air being so regulated that particles of coal, when sufficiently reduced, are carried away. Pulverized coal particles of which about 99 percent are below 0.01 inch in diameter will burn very rapidly and efficiently. Low-grade coal may be pulverized and conveyed from the mill by air into the boiler plant.

Power Shovel -- An excavating and loading machine consisting of a digging bucket at the end of an arm suspended from a boom, which extends crane-like from that part of the machine which houses the power plant. When digging the bucket moves forward and upward so that the machine does not usually excavate below the level at which it stands.

Pregnant Solution -- A value-bearing solution in a hydrometallurgical operation.

Preparation Plant -- Strictly speaking, a preparation plant may be any facility where coal is prepared for market, but by common usage it has come to mean a rather elaborate collection of facilities where coal is separated from its impurities, washed and sized, and loaded for shipment.

Proximate Analysis -- The determination of the compounds contained in a mixture as distinguished from ultimate analysis, which is the determination of the elements contained in a compound. Used in the analysis of coal.

- Q -

Quarrying -- The surface exploitation of stone or mineral deposits from the earth's crust. Removal of rock which has value because of its physical characteristics.

- R -

Reclamation -- The costs incurred to restore land to its original (or better) condition.

Rock Dusting -- The dusting of underground areas with powdered limestone to dilute the coal dust in the mine atmosphere thereby reducing explosion hazards.

Roll -- Used to describe minor deformations or dislocations of a coal seam, for example, faults with small displacement to small monoclinal folds, to welts or ridges projecting from either the roof or floor into the coal, and to fillings of stream channels or low areas extending downward into the coal.

Roof Bolting (Pinning) -- A system of roof support in mines. Boreholes from 3 to 8 feet long are drilled upward in the roof and bolts of 1 inch diameter or more are inserted into the holes and anchored at the top by a split cone or similar device. The bolt end protrudes below roof level and is used to support roof bars, girders, or simple steel plates pulled tight up to the roof by a nut on the bolt head. The bolts are put up to a definite pattern. The idea is to clamp together the several roof beds to form a composite beam with a strength considerably greater than the sum of the individual beds acting separately.

Room -- A place abutting an entry or airway where coal has been mined and extending from the entry or airway to a face.

Room and Pillar -- A system of mining in which the distinguishing feature is the winning of 50 percent or more of the coal or ore in the first working. The coal or ore is mined in rooms separated by narrow ribs or pillars. The coal or ore in the pillars is won by subsequent working, which may be likened to top slicing, in which the roof is caved in successive blocks. The first working in rooms is an advancing, and the winning of the rib (pillar) a retreating method. The rooms are driven parallel with one another, and the room faces may be extended parallel, at right angles, or at an angle to the dip. This method is applicable to flat deposits, such as coal, iron ore, lead, zinc, etc., that occur in bedded deposits.

Rotary Dump -- An apparatus for overturning one or more mine cars simultaneously to discharge coal. They may rotate either 180 degrees or 360 degrees.

Royalty -- A share of the product or profit reserved by the owner for permitting another to use the property. A lease by which the owner or lessor grants to the lessee the privilege of mining and operating the land in consideration of the payment of a certain stipulated royalty on the mineral produced.

Runoff -- That portion of the rainfall that is not absorbed by the strata; is utilized by vegetation or lost by evaporation or may find its way into streams as surface flow.

- S -

Scraper Loader -- A machine used for loading coal or rock by pulling an open-bottomed scoop back and forth between the face and the loading point by means of ropes, sheaves, and a multiple drum hoist. The filled scoop is pulled on the bottom to an apron or ramp where the load is discharged onto a car or conveyor.

Screen -- A large sieve for grading or sizing coal, ore, rock, or aggregate. It consists of a suitably mounted surface of woven wire or of punched plate. It may be flat or cylindrical, horizontal or inclined, stationary, shaking, or vibratory, and either wet or dry operation.

Screenings -- Coal which will pass through the smallest mesh screen normally loaded for commercial sale for industrial use.

Seam -- A stratum or bed of coal or other mineral; generally applied to large deposits of coal.

Shaft -- An excavation of limited area compared with its depth, made for finding or mining ore or coal, raising water, ore, rock, or coal, hoisting and lowering men and material, or ventilating underground workings. The term is often specifically applied to approximately vertical shafts, as distinguished from an incline or inclined shaft. A shaft is provided with a hoisting engine at the top for handling men, rock, and supplies, or it may be used only in connection with pumping or ventilating operations.

Shaker Conveyor -- A conveyor consisting of a length of metal troughs, with suitable supports, to which a reciprocating motion is imparted by drives. In the case of a downhill conveyor, a simple to-and-fro motion is sufficient to cause the coal to slide. With a level or a slight uphill gradient, a differential motion is necessary, that is, a quick backward and slower forward strokes. The quick backward stroke causes the trough to slide under the coal, while the slower forward stroke moves the coal along to a new position. Also called jigger.

Shale -- A laminated sediment, in which the constituent particles are predominantly of the clay grade.

Shearing -- Making a vertical cut or groove in a coal face, breast, or block, as opposed to a kerf, which is a horizontal cut. Called in Arkansas as cut or cutting.

Shoot -- To break coal loose from the seam by the use of explosives; loosely used, also as applied to other coal breaking devices.

Shooter -- The person who fires a charged hole after satisfying himself/herself that the area is free from firedamp. A shot firer.

Short Ton -- A unit of weight that equals 20 short hundredweights or 2,000 avoirdupois pounds. Used chiefly in the United States, in Canada, and in the Republic of South Africa.

Shortwall -- The reverse of longwall, frequently used to mean the face of a room. A method of mining in which comparatively small areas are worked separately, as opposed to longwall; for example, room and pillar.

Shot Firer -- A person whose special duty is to fire shots or blasts, especially in coal mines. A shot lighter.

Shovel -- Any bucket-equipped machine used for digging and loading earthy or fragmented rock materials. There are two types of shovels, the square-point and the round-point. These are available with either long or short handles. The round-point shovel is used for general digging since its forward edge, curved to a point, most readily penetrates moist clays and sands. The square-point shovel is used for shoveling against hard surfaces or for trimming.

Shuttle Car -- A vehicle on rubber tires or caterpillar treads and usually propelled by electric motors, electrical energy which is supplied by a diesel-driven generator, by storage batteries, or by a power distribution system through a portable cable. Its chief function is the transfer of raw materials, such as coal and ore, from loading machines in trackless areas of a mine to the main transportation system.

Silt -- A fine-grained sediment having a particle size intermediate between that of fine sand and clay.

Slack -- Small coal, usually less than 1/8 inch. It has a high ash content and is difficult to clean in the washery. High ash slack is being used increasingly in special boilers and power stations.

Slice -- In an ore body of considerable lateral extent and thickness, the ore is removed in layers termed slices.

Slope -- The main working gallery or entry of a coal seam which dips at an angle and along which mine cars are hauled. An entrance to a mine driven down through an inclined coal seam; also, a mine having such an entrance.

Slope Mine -- A mine with an inclined opening used for the same purpose as a shaft or a drift mine. It resembles a tunnel, a drift, or a shaft, depending on its inclination.

Sludge -- Mineral, mud, and slurry too thick to flow. A soft mud, slush, or mire; for example the solid product of a filtration process before drying (filter cake).

Slurry -- The fine carbonaceous discharge from a colliery washery. All washeries produce some slurry which must be treated to separate the solids from the water in order to have a clear effluent for reuse or discharge. Also, in some cases, it is economical to extract the fine coal from the effluent.

Spoil Bank -- To leave coal and other minerals that are not marketable in the mine.

Stoker Coal -- A screen size of coal specifically for use in automatic firing equipment. This coal can be of any rank and the stoker is usually designed to fit the coal available. Factors of importance in the selection of coal for stoker use are: size limits, size consist, uniformity of shipments, coking properties, ash fusion characteristics, ash, sulfur and volatile-matter percentages.

Strip -- In coal mining, to remove the earth, rock, and other material from a seam of coal, generally by power shovels. Generally practiced only where the coal seam lies close to the earth's surface. To remove from a quarry, or other open working, the overlying earth and disintegrated or barren surface rock.

Strip Mine -- An opencut mine in which the overburden is removed from a coal bed before the coal is taken out.

Subsidence -- A sinking down of a part of the earth's crust. The lowering of the strata, including the surface, due to underground excavations. Surface caving or distortion due to effects of collapse of deep workings.

Surface Mining -- The mining in surface excavations. It includes placer mining, mining in open glory-hole or milling pits, mining and removing ore from open cuts by hand or with mechanical excavation and transportation equipment, and the removal of capping or overburden to uncover the ores. Mining at or near the surface. This type of mining is generally done where the overburden can be removed without too much expense. Also called strip mining, placer mining, opencast mining, opencut mining, or open-pit mining.

Surface Rights -- The ownership of the surface of land only, where mineral rights are reserved. Those reserved to the owner of the land beneath which ore is being mined. The right of a mineral owner or an oil and gas lessee to use so much of the surface of land as may be reasonably necessary for the conduct of operations under the lease.

- T -

Timber -- Any of the wooden props, posts, bars, collars, lagging, etc., used to support mining works. One of the steel joists or beams which, in some mines, have replaced wooden timbers.

Timbering -- The operation of setting timber supports in mine workings or shafts. The term support would cover the setting of timber, steel, concrete, or masonry supports.

Timbering Machine -- An electrically driven machine to raise and hold timbers in place while supporting posts are being set after cut to length by the machine's power-driven saw.

Tipple -- Originally the place where the mine cars were tipped and emptied of their coal, and still used in that sense, although now more generally applied to the surface structures of a mine, including the preparation plant and loading tracks.

Trailing Cables -- A flexible electric cable for connecting portable face machines and equipment to the source of supply located some distance outby. The cable is heavily insulated and protected with either galvanized steel wire armoring, extra stout braiding hosepipe, or other material.

Trolley Wire -- The means by which power is conveyed to an electric trolley locomotive. It is hung from the roof and conducts power to the locomotive by the trolley pole. Power from it is sometimes also used to run other equipment.

- U -

Undercut -- Excavation of ore from beneath a larger block of ore to induce its settlement under its own weight.

- V -

Vein -- A zone or belt of mineralized rock lying within boundaries clearly separating it from neighboring rock. It includes all deposits of mineral matter found through a mineralized zone or belt coming from the same source, impressed with the same forms and appearing to have been created by the same processes. A mineralized zone having a more or less regular development in length, width, and depth to give it a tabular form and commonly inclined at a considerable angle to the horizontal. The term lode is commonly used synonymously for vein.

Volatile Matter -- Those products, exclusive of moisture, given off by a material as gas and vapor, determined by definite prescribed methods which may vary according to the nature of the material. In the case of coal and coke, the methods employed shall be those prescribed in the Standard Methods of Laboratory Sampling and Analysis of Coal and Coke (ASTM Designation D271) of the American Society for Testing Materials.

- W -

Wall -- The side of a lode; the overhanging side is know as the hanging wall and the lower lying side as the footwall. The face of a longwall working or stall, commonly called coal wall. A rib of solid coal between two rooms; also, the side of an entry.

Washery -- A place at which ore, coal, or crushed stone is freed from impurities or dust by washing. Also called wet separation plant.

Wheel Excavator -- A large-capacity machine for excavating loose deposits, particularly at quarries and opencast coalpits. It consists of a digging wheel, rotating on a horizontal axle, and carrying large buckets on its rim.

Wire Rod -- Hot-rolled coiled stock that is made into wire.

Working Place -- The place in a mine at which coal or ore is being actually mined.

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Appendix II

Additional Reading Material

"Facts About Coal", National Coal Association, 1130 17th Street, N.W., Washington, DC, 20036, (202) 463-2625.

The Making, Shaping and Treatment of Steel, "Solid Fuels and Their Utilization", (pages 109-119), 10th Edition, 1985, Association of Iron and Steel Engineers.

"Coal — Ancient Gift Serving Modern Man", National Mining Association.