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Draft Guidance: Conventional Bonding for Land Reclamation – Coal
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DOCUMENT ID: 563-2504-001

TITLE: Conventional Bonding for Land Reclamation - Coal

EFFECTIVE DATE: To be determined

AUTHORITY: Surface Mining Conservation and Reclamation Act
Coal Refuse Disposal Control Act

POLICY:
The Department will require coal mining activities to be bonded in an amount that covers the Department's cost to complete the site's reclamation plan.

PURPOSE:
This guidance describes the regulatory and statutory requirements for determining bond amounts. It also establishes bond rates and the process for determining the bond for land reclamation.

APPLICABILITY: This guidance applies to all anthracite and bituminous coal mining permits.

DISCLAIMER:
The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the Department to give these rules that weight or deference. This document establishes the framework, within which the Department will exercise its administrative discretion in the future. The Department reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 29

LOCATION: Vol. 12, Tab 60

TABLE OF CONTENTS

DEFINITIONS

ABS – the alternate bonding system.

AML – abandoned mine lands.

BAMR – the Bureau of Abandoned Mine Reclamation. This bureau of the Department of Environmental Protection bids and contracts the reclamation of abandoned mine lands and pre-primacy forfeited mine sites.

Bond Rate Guidelines (BRG) – the costs for given unit operations in land reclamation as published by the Department in Appendix A of this document and in subsequent years in the *Pennsylvania Bulletin* and used as the basis for determining bond amounts under the conventional bonding system.

CRDCA – the Coal Refuse Disposal Control Act. This is the Pennsylvania statute covering the disposal of coal refuse. (52 P.S. §§ 30.51-30.66)

CSL – the Clean Streams Law. This is the Pennsylvania statute covering the operation of mines and pollution from mines. (35 P.S. §§ 691.1-691.1001) [I'm not sure I agree with the first part of this sentence]

Department – Pennsylvania Department of Environmental Protection.

Financial guarantee – an alternative financial assurance mechanism, issued in a sum-certain amount and backed by the Department, to be used as a bond for the purposes and objectives of the bonding program.

Land reclamation – in the context of the conventional bonding system, land reclamation is the suite of activities needed to accomplish reclamation, e.g., backfilling, grading and planting, under the approved reclamation plan. It also includes the demolition of structures and sealing of boreholes and mine openings. It does not include the abatement or treatment of post mining discharges that occur during or after the permit term or activities necessary to address the impacts to land or water (including loss, diminution, or degradation of water supplies) resulting from mine subsidence.

Mining area – in the context of the conventional bonding system, this is the portion of the permit area on which mining and reclamation activities are authorized.

Multiple bench – this term applies to operations wherein the cross section looks like a set of steps, as opposed to operations with one highwall. This term does not apply to those operations with a highwall that has been developed with a "safety bench."

Operational area – in the context of the conventional bonding system, the Operational Area is the maximum portion of the permitted area that the permittee is authorized to disturb at any specific time. The Operational Area is described in the permittee's mining and reclamation plans. The Operational Area must include all of the land affected by mining activities that is not planted, growing and stabilized. The various sub-units of the Operational Area are used with the

Bond Rate Guidelines to calculate the sum of the permittee's liability for mining and reclamation activities. The sum of the permittee's liability for mining and reclamation activities determines the amount of the bond. The Operational area may float (move) throughout the approved Mining Area within the Surface Mining Permit (SMP).

OSM – the United States Department of the Interior, Office of Surface Mining, Reclamation and Enforcement. It is the federal agency designated to implement the provisions of the federal Surface Mining Control and Reclamation Act of 1977.

Permit – a permit for coal mining activities issued under the following Pennsylvania statutes: the Surface Mining Conservation and Reclamation Act, the Coal Refuse Disposal Control Act and the Clean Streams Law.

SMCRA – the Surface Mining Conservation and Reclamation Act. This is the Pennsylvania statute covering the surface activities of coal mines. It covers both anthracite and bituminous mines. (P.S. 52 §§ 1396.1-1396.31)

Unit costs – in the context of the conventional bonding system, these are the costs for the individual unit operations that make up land reclamation and are based on the actual costs incurred by the Department to complete reclamation or based on other appropriate sources. Examples of unit operations are grading, topsoil replacement, and planting.

BACKGROUND

For almost 60 years Pennsylvania law has regulated surface mining, and has required some degree of land reclamation. For most of the same period it has also required bonds, in changing amounts and formats, to ensure the required land reclamation. The current requirements for both land reclamation and bonding are found in the *Surface Mining Conservation and Reclamation Act* (SMCRA) (52 P.S. §§ 1396.1-1396.31), the *Coal Refuse Disposal Control Act* (CRDCA) (52 P.S. §§ 30.51-30.66) and the Clean Streams Law (CSL) (35 P.S. §§ 691.1-691.1001). These acts require a bond to be filed prior to commencement of mining, and to be conditioned *"…that the permittee shall faithfully perform all of the requirements…."* (SMCRA § 4(d); CRDCA § 6(a); CSL § 315(b)). One of these requirements is to ensure the implementation of the restoration measures assuring there will be no polluting discharges after mining ceases. The land reclamation ensures there will not be pollution from erosion. The permit will not be issued if there is evidence there will be a post mining discharge.

The conventional bonding system is based on the mine operator's description of the maximum amount of reclamation needed during the term of the permit. The proposed dimensions of the mining activity are combined with bond rate guidelines to calculate the total bond. The Department developed bond rate guidelines using actual bid costs submitted for abandoned mine lands and forfeited mine sites reclamation contracts and other appropriate sources. Revised guidelines will be published in the *Pennsylvania Bulletin* annually.

This Technical Guidance Document has been revised. A more complete history is included in Appendix B.

PROCEDURES

I. GENERAL

Terms and conditions of bonds are unchanged by the implementation of this guidance. The minimum amount of bond remains $10,000 for bituminous mines and $5,000 for anthracite mines

The bonding system covers permits for surface coal mining, coal refuse reprocessing, coal refuse disposal, underground coal mining and coal preparation plants. It does not include bonding for replacement of water supplies under SMCRA when the operator chooses to bond, rather than provide proof of insurance coverage. It does not include bonding to address impacts to land or water resulting from mine subsidence under the Bituminous Mine Subsidence and Land Conservation Act.

II. SETTING BOND RATE GUIDELINES

A. Discussion

Pennsylvania's mining laws, SMCRA, CRDCA and CSL, provide the basis for conventional bonding. The conventional bonding system incorporates the bonding obligations of those acts and the regulations and considers the following:
The bond amount is the cost to the Commonwealth for hiring a contractor to complete the permitted reclamation plan to regulatory standards. It reflects the Commonwealth's maximum responsibilities under the approved operation and reclamation plan for land reclamation.

Permit approval requires a finding that there is "…*no presumptive evidence of pollution to the waters of the Commonwealth*…." (25 Pa Code § 86.37(a)(3)). Consequently, post mining pollutional discharges of mine drainage are not anticipated in the reclamation plan. The calculation of the initial bond amount for a coal mining permit does not include costs for the treatment of mine drainage or anything not anticipated in the approved permit and reclamation plan.

The operation and reclamation plans in the coal mining permit application describe how the operator will mine and reclaim the site. The Department relies upon the operator's plans, plus site-specific special conditions, when calculating the total bond. The Department will consider, but not necessarily rely upon, cost estimates provided by the applicant.

Many factors contribute to the design of a mine site. This guidance and the Bond Rate Guidelines do not attempt to anticipate all the possible scenarios. Department personnel are expected to handle each case by giving as much deference as possible to the operator's plans. If the methods of mining or operation change, standards of reclamation change, or the cost of reclamation, restoration or abatement work increases, the Department will require the permittee to recalculate the bond.

Under the conventional bonding system the applicant will predict the maximum disturbed areas based on site conditions and the operation and reclamation plans in the permit application.

Regulatory requirements for plans and minimum performance standards are found in 25 Pa. Code Chapters 86-90. The total bond is calculated using the unit costs for the various operations necessary to complete the reclamation plan.

Conventional bonding requires two distinct kinds of calculations. First is the calculation of the costs for the different unit operations typically needed to complete land reclamation. These are called the Bond Rate Guidelines (BRG). Second is the application of the BRG to the operator's proposed mining activities to arrive at the bond amount.

B. General Methodology

The Department has set the BRG using unit costs developed from contracts to reclaim abandoned mine land and forfeited sites. The unit cost for a specified unit operation was obtained by averaging the three lowest unit costs for that unit operation from each contract awarded in the last three years.

In the event that a given unit operation was not adequately represented in the preceding three years, then any additional cost information available was used. If enough data was still not available, the rate was set from a standard reference like "*Means Building Construction Cost Data.*" Occasionally, specific unit costs may be adjusted using information provided by BAMR and other stakeholders.

The Department will publish the BRG each year in the Pennsylvania Bulletin as required under 25 Pa. Code §86.145.

C. Additional Considerations

Not all unit operations included in the BAMR database are included in the BRG. For example, the "Clearing and Grubbing" unit operation is not normally applicable to reclamation of bond forfeiture sites. Other unit operations listed in the database were combined to streamline the BRG.

Several unit operations deserve special explanation. Two of these involve grading for the purpose of backfilling and replacing topsoil. Typically, costs for grading are based on the volume of material in cubic yards to be moved and consider, among other factors, the type of equipment to be used and the distance that material must be moved. The distance is easily determined from the operations map by measuring from the outside limit of spoil to the highwall.

The lower unit cost for grading listed in the BRG was based on the presumption that the spoil is pushed into the excavation. The higher unit cost for grading was based on the need to load and haul the spoil. The break point between these two is 500 feet, which is roughly the maximum distance for pushing spoil with a large dozer.

Another unit operation that involves grading is called selective grading. This unit operation is used for removing, or grading out, ditches, roads, storage areas and other features that have the earthen material within or adjacent to the feature.

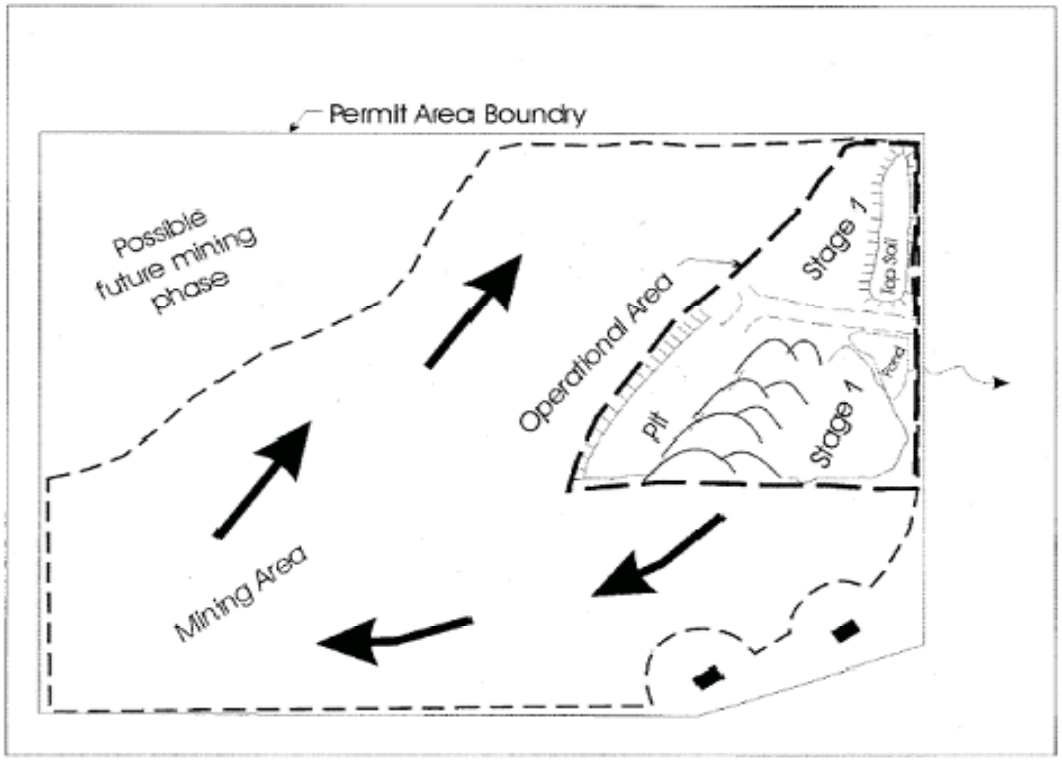
The other unit operation needing an explanation is the cost per stem for tree planting. Since, most site reforestation by BAMR on primacy forfeitures has been done under an agreement with the Department of Conservation and Natural Resources, Bureau of Forestry, the unit cost for tree planting is based on pricing information from the DCNR Penn Nursery.

III. CALCULATING SITE-SPECIFIC BOND AMOUNTS

A. Operational Area Concept

The conventional bonding system utilizes the concept of an operational area that involves bonding a pit or extraction area at one rate to cover the grading and revegetation obligations. The area reclaimed to Stage 2 standards is bonded at another lower rate to cover the Stage 3 maintenance period. Under this concept, the location of the pit moves within the Mining Area. The concept diminishes the importance of delineating the exact location on the permit where mining activities are occurring at a given point in time.
Using this approach for the conventional bonding system, the operator delineates the total area to be bonded and affected by surface mining activities. on the operations map (Exhibit 9 in the permit application). This is called the Mining Area. The operator must describe the size and characteristics of the mining activities that comprise the Operational Area such as the maximum volume of open pit(s), the size of the pit and spoil area, the area needed for support activities, areas in the process of being reclaimed, and the revegetation requirements . These factors are used to calculate the bond. Once an operator has posted the appropriate bond, which covers the Operational Area, then the Operational Area (mining activities) can move throughout the Mining Area. The approved dimensions (e.g. volume, area) of the Operational Area components will appear as special conditions in the permit. Figure 1 illustrates the relationships of the Operational Area, Mining Area and permit area.

Phased mining on permits is allowed. To phase an operation, the operator shows the phases on the operations map (Exhibit 9). The bond for the initial phase is calculated based upon the Operational Area within that phase only. The Mining Area becomes the initial phase. Consequently, the Operational Area (mining activities) must remain within that phase of the permit. Activating additional phases, i.e., increasing the Mining Area, requires the bond to be recalculated.



Permit area boundary: Frequently based on property lines.

Mining area: Area on which mining is authorized.

Operational area: Area affected by mining, support and reclamation activities, including area reclaimed to Stage 1 standards. Reclaimed area that is planted, growing, and stable is not included in the operational area.

FIGURE 1

On many mine sites, not all ponds and erosion and sediment control features will be in place at the same time. In this scenario, the operator need only post the bond to cover the removal and reclamation of the maximum number ponds and features that will be in place at any one time during the permit term.

B. Bond Calculation Procedures

The amount of the site-specific conventional bond depends to a great extent on how the operator chooses to mine the site. The operator's mining plan determines the maximum possible liability on the site during the permit term. The operator identifies the volumes, area, and other measures of the unit operations in the operation and reclamation plans including the maximum disturbed area not planted. The Department calculates the bond amount by applying the current Bond Rate Guidelines.

The total bond for the site is the sum of the costs for the component unit operations and any indirect costs. The formula for calculating the bond amount is:

Total Site Bond = Direct Costs + Indirect Costs

Direct Costs equal the sum of all the different unit operations times the appropriate unit cost listed in the BRG.

Indirect Costs are a percentage of the direct costs. Two types of indirect cost are considered in the conventional bonding system. They are mobilization/demobilization of equipment and the installation of erosion and sediment controls.

Mobilization/demobilization apply to every site. The cost for erosion and sediment controls is not applicable in every situation and is calculated only when the reclamation plan calls for construction of temporary erosion and sediment control structures.

Conventional bonding requires bond for several kinds of activities previously not bonded. Bonds to complete stream, public road, and utility relocations may be required. Likewise, the costs to the Commonwealth to complete wetland mitigation or removal and demolition of structures, such as electric substations, need to be included in the bond amount.

Part of the Department's job is to make sure the operation and reclamation plans in the application can be feasibly accomplished as required by 25 PA Code § 86.37(a)(2). The Department will compare the information submitted by the operator with the other plans and data in the application modules. If the data on the *Bond Calculation Worksheet* conflicts with the application data or other information available to the Department, the Department will discuss the discrepancy with the operator. If unresolved, then the Department will apply the factors or dimensions that it considers appropriate and request bond.

In the event that an applicant declines to specify a volume and/or acreage, the Department will assume a regulatory maximum. For instance, if the applicant does not specify a pit size the bond will be based upon the regulatory maximum of 1,500 feet by 300 feet (457.2 meters by 91.4 meters) for the highest overburden on the mining area.

In any event, the Department will include a draft copy of the special conditions with the request for bond.

If a permittee disagrees with the District Office staff about the amount of bond needed for a permit, the dispute resolution process detailed in Appendix D will be used.

IV. BONDING SPECIAL FEATURES

A. Structures Not Needing Bonds

Under the conventional bonding system some facilities do not need to be considered in determining the bond amount. For instance, if the application includes releases to allow ponds or haul roads to remain as part of the post mining land use, then no bond is needed for their

reclamation. Several scenarios are possible which can eliminate the need to bond certain activities:

- The activity is completed prior to mining. For example the permanent relocation of utility lines; or the construction of mitigation wetlands prior to disturbing the existing wetland.
- The activity is bonded for reclamation by other agencies. An example would be the mining out and reconstruction of a public road. If the agency with control of the road requires a bond for replacing or reconstructing the road then duplication of bonding by the Department is unnecessary.
- Buildings and structures for which the applicant provides the Department with an agreement or instrument allowing the structure to remain as part of the approved post mining land use.
- Areas already bonded for reclamation under another mining permit.

B. Coal Ash Placement

A number of permits involve coal ash placement for reclaiming abandoned pits, i.e., the beneficial use of coal ash as fill material. These permits are typically found in the anthracite area. The purpose of the bond for coal ash placement is to cover and vegetate any coal ash that has been placed in the abandoned pit. The bond is not intended to cover the complete filling of the abandoned pit.

If coal ash placement has been approved under a permit, the operation and reclamation plans will identify the source and type of material to be used as the cover and growing medium and the plan for revegetation. Therefore, the bond amount is determined by the size of the placement area, in acres, the unit cost for select grading to shape the coal ash that has been placed, the distance cover material must be moved (unit cost for grading) and the unit cost for revegetation.

If a permit includes coal ash placement in an active pit, i.e., a pit the operator is responsible for reclaiming, the bond should be based on achieving the approved reclamation plan and the assumption that there is no coal ash on-site and that backfilling will involve only spoil.

C. Coal Refuse Reprocessing

The objective of the bond on refuse reprocessing operations is to stabilize and vegetate the operational area, i.e., the area affected by the reprocessing activities. For these sites, the bond is determined by applying the unit cost for select grading to reduce working faces and other areas affected by the operator, the unit cost for grading to cover the area with the soil or other material identified in the reclamation plan and the appropriate unit cost for revegetation. Reclamation of areas not affected by the operation is not the responsibility of the operator, even if those areas are on the permit area.

D. Water Supply Replacement Bonds

Section 3.1(c) of SMCRA requires mine operators to provide insurance to cover damage to public and private water supplies, which the Department determines may be affected by the mining activities. This requirement applies only to surface coal mines and the surface facilities

of underground mines, coal preparation plants and coal refuse disposal operations. It is not applicable to damage to water supplies from underground mine workings or mine subsidence. A mine operator may use insurance coverage or a water supply replacement bond to provide financial assurance that water supplies affected by surface mining activities can be replaced. Technical Guidance Document 562-2500-702, *Insurance Requirements and Water Supply Replacement Assurance* describes the policy and procedures for implementing this requirement. The water supply replacement bond is a separate bond instrument. It is not included in the conventional bonding system and is not subject to staged bond releases and public notice.

E. Bonding Of Bituminous Underground Mines And Coal Preparation Facilities.

Reclamation liability for bituminous underground mines and coal preparation facilities has been and will continue to be calculated at the time of major permitting actions rather than on an annual basis as described in Section V. The scope of reclamation work at these sites seldom changes between permit issuance and permit renewal. Any increase in the area of surface disturbance requires a permit revision and recalculation of the reclamation liability. These periodic calculations and corresponding bond adjustments are sufficient to address changes in reclamation liability as they occur over the life of the permit.

F. Remining Financial Guarantees Bond Program

The Department has developed a number of programs to address the environmental problems associated with abandoned mine lands (AML). For the Department, the most cost-effective program is remining. In remining, a mine operator re-affects and reclaims abandoned mine lands in order to extract the remaining coal.

The Department has developed several incentives to encourage remining. One of these is the Remining Financial Guarantees Program. This program allows the Department to provide remining operators with financial guarantees to satisfy part of their bonding obligation. The amount of a remining financial guarantee is based on the size of the remining area.

The Remining Financial Guarantees program has been modified and expanded to continue to be an incentive for remining under the conventional bonding system. The Office of Surface Mining Reclamation and Enforcement (OSM), has agreed that OSM funds for the AML "10% set-aside" program can be used to back remining financial guarantees on permits that are located in qualifying watersheds.

Early in the permit application process an operator may apply to the Department for participation in the Remining Financial Guarantees Program. The Department would be responsible to make an AML eligibility determination of the remining area, calculate the cost of reclaiming the AML site, and gather other requisite information needed by OSM to do a review as required by the National Environmental Policy Act of 1969 and render an authorization to proceed, the same as with any AML project. The conventional bond for the permit will be calculated. The Department will issue a remining financial guarantee as part of the requisite bond in an amount equal to the cost of reclaiming the AML portion of the permit. The operator will provide a bond for the difference between the state-issued guarantee and the full conventional bond calculation for the permit.

V. REPORTING AND RECALCULATION OF BOND AMOUNTS

A. Annual Review

The Annual Report submitted by the permittee and reviewed by the Department is the mechanism that the permittee uses to document the reclamation progress accomplished on the permit as well as to document that the reclamation liability is equal to or below the cost for the Department to complete reclamation on the site (bond amount). The permittee's submittal documents the notification to individual property owners about reclamation standards Stage I, II, and III achieved on their properties within the permit area. The permittee also uses this mechanism to document which areas have been planted so the "5 year clock" can start on future Stage III achievements.
An annual review submittal needs to include the following:

- Documents landowner notification of reclamation completed on property
- Map indicating areas planted in last year (and when) and location of various units of the operational area.
- Comparison of current reclamation liability vs. bonded liability

On each anniversary of permit issuance, and continuing until the entire site is planted growing and stabilized, the operator will identify the current reclamation liability, and provide copies of landowner notification of reclamation completed in the last year. At the first and second annual reviews after permit issuance, the BRG used with the original application may be used. For the third annual review (i.e. the midterm review) the current bond rate guidelines BRG must be used. These same BRG are to be used during the 4th annual review.

Annual Review
1 Original BRG (Permit Application)
2 Original BRG (Permit Application)
3 Current BRG
4 Year 3 BRG
5 Current BRG

The exemption from annual review request must be in writing, and it must be received by the District Office by the anniversary date of permit issuance. If the Surface Mine Conservation Inspector concurs, then approval will be noted in either a letter to the operator or in an inspection report. An exemption waiver can be requested and granted for parts or all of the annual review submittal.

Examples of when an operator may request an exemption from the annual review reporting of operational liability are appropriate include;

- When operational liability has been calculated within the last 90 days
- There have been no mining activities within the last year

Because the conventional bonding system will generally eliminate incremental bond releases, the operator must provide a written notice to the owners at the anniversary of the permit issuance of properties on which Stage 1 or 2 reclamation was completed in the preceding 12 months. The operator must provide the District Mining Office with a copy of this notice. The notice must inform the landowners of the reclamation and explain that they should contact the appropriate District Mining Office if they wish the Department to make a formal determination on the adequacy of the reclamation and have the right to appeal that determination.

Rather than including inflation in the bond amount calculation, the Department will regularly evaluate the cost of reclamation. At each midterm review of surface mining permits and at each permit renewal, the Department will compare the current bond amount with the cost of reclamation based on the current BRG when the application is filed. At mid-term review the bond will have to be adjusted if there is a greater than 15% increase in the cost of reclamation liability. The Department will also evaluate reclaimed areas to determine if those areas meet the Approximate Original Contour (AOC), Stage 1 and 2 standards.

If the permittee expands the operational area at the 3 year annual review (midterm review) then the 15% leeway does not apply.

If, at the expiration of the permit term, the operator chooses to renew a permit for additional mining or to continue mining, the bond amount will be recalculated using the current BRG when the renewal application is filed. The additional bond must be submitted and approved prior to renewal. The Department will evaluate reclaimed areas to determine if they meet AOC, Stage 1 and 2 standards. (Note: This provision includes renewal at 3 years for permits on which mining activities have not started.)

When revisions (that require recalculation to the operational liability that affect the operation or reclamation plans) are submitted with the annual review a recalculation of the bond amount at current rates can be required.

B. Permit Revisions/ Bond Adjustments

Revisions that require recalculation to the operational liability that affect the operation or reclamation plans can require a recalculation of the bond amount at current rates. Except for the addition of boreholes associated with underground mines, coal preparation plants and coal refuse disposal operations, the additional bond, if needed, shall be posted and approved prior to approval of the revision. Bonds for additional boreholes associated with underground mines, coal preparation plants and coal refuse disposal operations will be requested at permit renewal.

Bonds must be adjusted up or may be adjusted down if there are changes to the operational area or the reclamation plan. Bond adjustments involving land no longer proposed for disturbance or for revising the cost estimate for land reclamation are not considered bond releases subject to the provisions of 25 Pa. Code §§ 86.170-175. Some reasons for adjusting bond amounts are:

- Moving onto a new phase of mining where conditions can affect the cost of reclamation or adding area to the unreclaimed area. These are adjustments to the operational area.
- Barrier reductions that affect the cost of reclamation.
- Revisions to the approved operation or reclamation plan such as:

- Leaving a road, pond, or other structure as part of the post mining land use.
- Moving into higher or lower cover.
- Changing the post mining land use.

A change in the mining area does not necessarily require an adjustment in the amount of bond.

VI. BOND RELEASE

25 Pa. Code § 86.175 (b) spells out the schedule for bond release. The amount of bond released may not exceed 60% of the total bond amount on the permit area or designated phase of a permit area upon completion of Stage 1 reclamation and approval by the Department.

Under the conventional bonding system, bond release can begin when the final pit is reclaimed to Stage 1 standards. At this time the operator may also request an adjustment of the bond down to the appropriate amount that was needed for the final pit at its maximum reclamation obligation and the other site conditions. The adjusted bond amount becomes the total amount of the bond from which the 60% is calculated. Bond adjustment and Stage 1 bond release may occur at the same time. Additionally, the permittee may at this or any other time request final release of liability on any areas on the permit that meet Stage 3 standards.

Upon completion of Stage 2 reclamation, the Department may release an additional amount of bond while retaining an amount of bond coverage sufficient to cover the cost of reestablishing vegetation and reconstructing drainage structures if completed by a third party.

After Stage 2 the actual cost to the Commonwealth to hire a contractor to complete the reclamation plan should be non-existent except for the possible cost to remove erosion and sediment controls. While there is no cost to the Commonwealth to complete the reclamation plan, bond is still required for the period of liability.

Since 1982 no total failures of revegetation on re-topsoiled sites have occurred. Occasionally an operator needs to return to the site for minor repairs. Typical seeding costs are from $800 - $1,200 per acre planted. Therefore, the Department has determined that retaining $500 per acre for the total area waiting for Stage 3 bond release is adequate.

The Department will release the final portion of the bond on the permit area or designated phase of a permit area after the standards for Stage 3 reclamation have been attained.

VII. MONITORING AND COMPLIANCE

Effective monitoring of an operation requires the Surface Mine Conservation Inspector (SMCI) to compare the operational liability used to calculate the bond with the conditions found on the site of the various components of the operational area used to calculate the bond with the

dimensions found on the site. If the SMCI believes the operational liability exceeds the bond, the SMCI should direct the operator to verify the operational liability

In cases where the actual liability exceeds the amount of bond, the operator is given a compliance order for violating permit conditions. Severely exceeding the dimensions, i.e., the liability is 15% or more than the bond, is a basis for cessation of additional overburden/coal removal, or coal refuse disposal until either additional bond is posted or reclamation has reduced the liability.

VIII. RECLAMATION FEES

The Department is currently pursuing changes to the appropriate regulations to no longer require collection of the reclamation fee. Until those changes are included in the regulations, the department will collect the $100/acre reclamation fee.

The reclamation fee is to be based upon the maximum size of the operational area as described in the approved operation and reclamation plans. For permits with remining financial guarantees, the reclamation fee will be reduced based on the amount of remining area included in the mining area. For example, if the operational area is 10 acres and the remining area on the entire permit is 6 acres, then the reclamation fee due is $400. If the remining area is greater than the operational area, then no reclamation fee is due. If the permittee changes the operation and reclamation plan and the operational area is increased, then a reclamation fee will be required for the additional area. A Permittee is obligated to complete reclamation of the abandoned mine land area that has been used to justify using Remining Financial Guarantees.

APPENDIX A

Dispute Resolution

When a dispute arises on the amount of bond calculated for the site, the operator may request a review of the calculation by the Permits Chief or the District Mining Manager. If following this review the dispute is not resolved, the operator can request the Department to establish an informal, three-person review board comprised of one Permit Chief or District Mining Manager from any of the other District Mining Offices, the Director of the Bureau of District Mining Operations or his designee, and the Director of the Bureau of Mining and Reclamation or his designee.

Both the operator and the District Mining Office shall present their positions to the informal review board. The decision of this board is not binding on the operator. If, following the informal review board's decision, the dispute remains, the operator can choose to either provide the bond and appeal the permit issuance to the Environmental Hearing Board, or refuse to provide the bond and appeal the permit denial to the Environmental Hearing Board.

Failure of an operator to invoke the dispute resolution process does not affect the operator's right to challenge the bond amount in an appeal to the Environmental Hearing Board.

APPENDIX B

History of Pennsylvania's Bonding Program for Coal Mining

For almost 60 years Pennsylvania's law has regulated surface mining, and has required some degree of land reclamation. For most of the same period it has also required bonds, in changing amounts and formats, to ensure the required land reclamation. The requirements, at the time that Pennsylvania changed to a conventional bonding system for both land reclamation and bonding were found in the *Surface Mining Conservation and Reclamation Act* (SMCRA) (52 P.S. §§ 1396.1-1396.31), the *Coal Refuse Disposal Control Act* (CRDCA) (52 P.S. §§ 30.51-30.66) and the Clean Streams Law (CSL) (35 P.S. §§ 691.1-691.1001). These acts required a bond to be filed prior to commencement of mining, and to be conditioned *"…that the permittee shall faithfully perform all of the requirements…."* (SMCRA § 4(d); CRDCA § 6(a); CSL § 315(b)). One of these requirements was to ensure the implementation of the restoration measures assuring there would be no polluting discharges after mining ceased. The land reclamation ensures there will not be pollution from erosion. The permit would not be issued if there is evidence there would be a post mining discharge.

SMCRA and CRDCA provided for two different bonding methods. In the first method, now called conventional bonding, the amount of the bond is the total cost to the Commonwealth to complete the approved reclamation plan. In the second bonding method, the amount of the bond was an amount established for an alternate bonding program. This alternate program must achieve the objectives and purpose of SMCRA, CRDCA and CSL.

Since 1981 Pennsylvania has used an alternate bonding system (ABS) for surface mine permits. The details of this program were established in an August 1, 1981, letter from Secretary Clifford Jones to all surface mine operators. It required a $3,000 per acre bond for actual mining areas and another $1,000 per acre bond for support activities, such as sediment controls, topsoil storage, ditches, and haul roads. Higher rates were imposed when the maximum thickness of rock overlying the coal exceeded certain depths (e.g., when the cover was between 85 feet and 115 feet thick, the rate was $4,000 per acre). When reclamation activities were completed these bonds were released. In addition, there was a statewide bond pool funded through the collection of a non-refundable, non-releasable reclamation fee. If forfeiture occurs, the money in the bond pool was to be used to supplement the per-acre bonds to cover the Department's cost to reclaim the site. In 1981 the reclamation fee was set at $50 per acre. The fee was increased to $100 per acre on August 7, 1993.

On July 30, 1981, before Pennsylvania achieved primacy, the ABS was challenged. The Pennsylvania Federation of Sportsmen's Clubs, the Sierra Club, Trout Unlimited, the Audubon Society, the Loyalsock Watershed Association, Wyona Coleman, and Paul Jurovcik petitioned Commonwealth Court for a Review in the Nature of a Complaint in Equity and Preliminary Injunction. On April 27, 1988, the suit was settled when the parties entered into a court-approved consent decree.

On October 1, 1991, OSM notified Pennsylvania that it believed the ABS was not as effective as the federal requirement. Pennsylvania has worked with OSM regarding their concerns over the ABS. However, on May 31, 1995, OSM again wrote the Commonwealth about concerns for the ABS. Throughout these discussions, conventional bonding was recognized as an option

available to Pennsylvania. In October 1999 the Pennsylvania Federation of Sportsmen's Clubs, the Pennsylvania Chapter Sierra Club, Pennsylvania Trout, Inc., Tri-State Citizens Mining Network and Mountain Watershed Association, Inc. filed suit in Federal District Court against both the Department and OSM. Among other things, the suit alleged the ABS did not meet the objectives and purpose of federal SMCRA.

The ABS had many shortcomings. There was a lack of parity between different categories of mining operations. Consequently, in the event of forfeiture, the contributions to the bond pool by some operators were not proportionate with contributions from others. For example, in the late 1990s, the Commonwealth's cost to reclaim a coal refuse disposal site, originally bonded at $1,000 per acre, averaged more than $20,000 per acre. Conversely, a surface mine, originally bonded at $3,000 per acre, may have cost the Commonwealth less than $7,000 per acre to reclaim.

Parity was also lacking within categories of mining. Operations with large open pit areas were much more expensive to reclaim than the average mine site. However, both paid the same reclamation fee and both used the same per acre bond rates.

Operators who do not intend to stay in business found it cheaper to forfeit bonds than to complete the reclamation required by law. Approximately 10% of the surface mining permits issued to Pennsylvania's industry resulted in forfeiture.

Additionally, OSM changed its interpretation of federal requirements. It dictated that ABS bond pools must cover the entire costs for treating water on forfeiture sites in perpetuity, without limitation. Continuation of the current ABS in the long term plus a decline in the number of active operators and increasing annual costs for treating water on forfeited sites meant fewer and fewer operators would have paid higher and higher fees into the bond pool. Eventually this cycle would have bankrupted the ABS.

In October 1999 Pennsylvania announced its decision to implement a conventional bonding system. The change represented the first major overhaul of the bonding mechanism in 17 years. The conventional bonding system was developed using principles from the OSM *Handbook for Calculation of Reclamation Bond Amounts* and from a 1989 DEP study called *Alternate Bonding - Final Report of the BMR Bond Work Group*.

The conventional bonding system is based on the mine operator's description of the maximum amount of reclamation needed during the term of the permit. The proposed dimensions of the mining activity are combined with bond rate guidelines to calculate the total bond. The Department developed bond rate guidelines using actual bid costs submitted for abandoned mine lands and forfeited mine sites reclamation contracts and other appropriate sources. Revised guidelines are published annually in the *Pennsylvania Bulletin*.

IMPLEMENTATION SCHEDULE

A. New Permits

The Department applied conventional bonding for land reclamation to applications for coal mining permits and permit revisions received after the effective date of this guidance August 4, 2001. The Department calculated the bond under the ABS for those applications under review on the effective date of this guidance August 4, 2001. Those applications were handled as existing permits as described in the next section, and they were eligible for conversion assistance.

B. Existing Permits

Permits bonded under the ABS needed to upgrade to the conventional bonding system. Since operators of active mines made decisions based, in part, on the ABS, the Department gave them time to provide bonds under the conventional bonding system. Each District Mining Office established the implementation schedule for the permits it covered. The District Mining Offices continued to accept requests for bond increments under the ABS until the permit was converted to the conventional bonding system.

The Department notified holders of existing permits of their obligation to post bond amounts determined under conventional bonding. The notice gave a date by which the revised bond had to be submitted and included worksheets for calculating the conventional bond. The Department established site-specific dates for bond submittal that allowed operators sufficient time to comply. If the bond under the conventional bonding system was significantly higher than the existing bond and the permit was not eligible for conversion assistance, the operator could negotiate a consent order and agreement that established a schedule for reduction of the existing reclamation liability, posting additional bond or both.

The Department evaluated sites that have been regraded and reclaimed, sites renewed for reclamation only, and sites with completed coal removal to determine if bond adjustment was necessary. The Department notified those operators who had to adjust their bonds.

During the period between the notification and the date on which a given permit was to adjust to an amount based on conventional bonding, the operator could consult with the appropriate District Mining Office regarding the amount of bond or potential revisions to the approved operation and reclamation plans.

Operators of existing permits did not have to wait until notified to adjust their bonds. If the existing bond was greater than the bond calculated under the conventional bonding system, the operator could request a bond adjustment. This adjustment of bond was not a bond release and was not subject to the regulatory requirements for bond release.

OPERATOR ASSISTANCE PROGRAMS

The Department developed programs to assist mine operators in complying with the change to the conventional bonding system. These programs were available through the District Mining Offices. The Conversion Assistance Program was available to operators with existing permits at the time that the Department directed the change to the conventional bonding system. This program provided a financial guarantee to cover the increase in bond required by converting to conventional bonding.

The Remining Financial Guarantees Bond Program provided a financial guarantee to cover the bond required by the conventional bonding system for remining portions of a permit. This program is intended to encourage remining on new permits. Financial guarantees under these programs could not be used to cover an operator's obligations for treating post mining polluting discharges. If a post mining discharge developed on a participating site, the operator was required to post another financial mechanism to guarantee long-term treatment.

A. Conversion Assistance Program

The Department issued land reclamation financial guarantees to current permit holders in a sum-certain amount equal to the increase in bonds dictated by the conversion from the existing ABS to the conventional bonding system. The objective of this program was to provide assistance to current permit holders who had difficulty providing additional land reclamation bonds for their current permits. The Conversion Assistance Program had the following conditions:

- The application for permit or permit revision was accepted for review by the Department before August 4, 2001
- Permits for which the Department had determined there was an obligation for treating a post mining discharge do not qualify for assistance under the Conversion Assistance Program unless the permittee and Department had a binding agreement to establish financial provisions for post mining treatment costs. Subchapter F and G permits were eligible.
- The Conversion Assistance Program land reclamation financial guarantee was to be an additional bond on the permit.
- The Conversion Assistance Program land reclamation financial guarantee is the first bond released from the permit, and the permittee had to demonstrate that any surety, financial institution or person with an interest in any collateral bond consents to the release of the land reclamation financial guarantee before all other bonds.
- The permittee submitted a request to the Department to be considered for participation.
- The permittee paid a fee of 1.5% per year of the amount of the financial guarantee annually.

The District Mining Office determined the amount of additional bond, and notified the permittee. The notification also included a Bond Transmittal Form and a letter requesting the additional bond and information on the conversion assistance program, including the amount of the annual fee. Upon receiving the information the permittee requested conversion assistance. The request indicated the projected life of the mine and included the fee, and written documentation that the surety, financial institution and any other person who had an interest in the existing bonds on the

permit had consented to the release of the land reclamation financial guarantee before all other bonds on the permit.

The Conversion Assistance Program was established because of concerns about the ability of many mine operators to convert existing permits to conventional bonding. These operators had already made financial and operational commitments based on their bonding capacity and the ABS. Likewise, the surety providers made decisions to provide bonds on existing permits based on the risk they were willing to take at that time. For operations where the conventional bond calculation was significantly greater than the bond posted under the ABS, operators would not have been able to comply with the mandatory bond adjustment. Those operators would have been faced with the uncertainty of a negotiated settlement with the Department regarding bonding and reclamation liability, or risk being forced out of business. The choice for the surety industry would be to provide more bonds than their risk assessment dictates, or risk forfeiture of the existing bond. The risk to the Department would be that forfeiture of existing inadequate bonds would further increase the deficit of the current ABS fund.

Funding for the Conversion Assistance Program was as follows:

- $5.5 million deposited into the current ABS fund to make the fund solvent for all outstanding forfeiture reclamation projects currently on the books.
- An additional $7 million financed the Conversion Assistance Program and covered up to $70,000,000 in bond exposure.

These amounts were based on the historic rate of bond forfeitures, the amount of forfeited bonds that had been collected, the cost of reclamation to the Department, and the number of sites operated under the ABS.

APPENDIX C

Bond Calculation Worksheet

(Instructions in italics)

GRADING

Backfilling

$$\left[\frac{\text{pit length (ft) X width (ft) X depth (ft)}}{27\ \text{ft}^3/\text{c.y.}}\right] \text{ X Unit Cost = \$}$$

Pit length and width are measured at the coals to be mined. If mining multiple seams, calculate the volume by benches. Use higher unit cost if spoil 500 ft or more from any pit.
Can adjust depth to exclude coal and other product minerals.
Use separate calculations for additional pits.
If using other methods to determine volumes, attach calculations.

Review Guide

Confirm distance to spoil dump(s).

Are pit dimensions compatible with equipment list?
Use drill hole data to confirm mineral volume (only if excluded from total).

Topsoil Handling

$$\left[\frac{\text{(acres needing topsoil X 43,560 ft}^2\text{/acre) X soil thickness (ft)}}{27\ \text{ft}^3/\text{c.y.}}\right] \text{ X Unit Cost = \$}$$

Include all soil horizons.
Amount is total of the maximum area where topsoil needs spread during permit term.
Use higher unit cost for grading if stockpiles are 500 ft or more from any pit.

Review Guide

Verify volumes by checking calculations and soil survey information.
Maximum area may occur during winter months when re-distribution isn't possible.

Selective Grading

Roads: $\left[\frac{\text{length (ft) X width (ft)}}{43{,}560\ \text{ft}^2/\text{acre}}\right]$ X Unit Cost = $

Other Facilities: area (acres) X Unit Cost = $

Use for grading out roads, ponds, stockpile and storage areas, erosion and sediment controls and other support areas.
Be sure to include in revegetation calculations.
Use selective grading unit cost.

REVEGETATION

Revegetation With Topsoil On-Site

area (acres) X unit cost = $

Area is maximum area needing planted at any given time during the permit term.	Review Guide
Assumes 3-tons/acre lime, 400-lbs./acre 10-10-10 fertilizer, 50-lbs./acre grass and legume seed mix, and 3-tons/acre mulch application.	Compare area to topsoil placement calculations.
Use unit cost for revegetation only when seeding soil materials	Can require a specific breakdown if plans in application are significantly different.

Revegetation Without Topsoil On-Site

Seed Bed Preparation: area (acres) X Unit Cost	=	$
Ag. Lime: area (acres) X (tons/acre) X Unit Cost	=	$
Nitrogen: area (acres) X (pound/acre) X Unit Cost	=	$
Phosphate: area (acres) X (pound/acre) X Unit Cost	=	$
Potash: area (acres) X (pound/acre) X Unit Cost	=	$
Seed: area (acres) X (pound/acre) X Unit Cost	=	$
Mulching: area (acres) X Unit Cost	=	$
Total	=	$

Area is maximum area needing planted at any given time during the permit term.	Review Guide
Application rates based upon root zone material testing.	Compare area to topsoil placement calculations.
Use specified unit costs when seeding non-soil materials.	Verify sampling plan appropriate for site and samples properly composited.

Reforestation

area to plant (acres) X (trees/acre) X Unit Cost = $

CHANNEL CONSTRUCTION

Use for stream relocations and for permanent ditches to remain as part of the postmining land use.

Excavation

$$\left[\frac{\text{cross section area (ft}^2\text{) X length (ft)}}{27\ \text{ft}^3\text{/c.y.}}\right] \text{ X Unit Cost = \$}$$

Channel Lining

Jute matting: $$\left[\frac{\text{perimeter of channel (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

High Velocity Erosion Control: $$\left[\frac{\text{perimeter of channel (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

Channel With Rock Lining

R3 Rock Lining (less than 6 inches): $$\left[\frac{\text{perimeter of top of rock lining (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

R4 Rock Lining (less than 12 inches): $$\left[\frac{\text{perimeter of top of rock lining (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

R5 Rock Lining (less than 18 inches): $$\left[\frac{\text{perimeter of top rock lining (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

Geotextile: $$\left[\frac{\text{perimeter of ditch (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

Polyvinyl Chloride Lining (PVC): $$\left[\frac{\text{perimeter of cross section of PVC liner (ft) X length (ft)}}{9\ \text{ft}^2\text{/sq.y.}}\right] \text{ X Unit Cost = \$}$$

SUBSURFACE DRAINS

length of drainage (ft) X Unit Cost = $

For each channel there will be channel excavation and a type of channel lining. Types of channel lining include jute matting, high velocity erosion control, R3 rock lining, R4 rock lining, and R5 rock lining. Rock lining requires

geotextile underneath the rock and this unit cost should be added to the rock lining cost. Also, if rock lining passes over fill material, a PVC liner must be installed over the fill area. The total quantities for channels include the sum of each channel excavation, type of lining, and use of PVC liner. A typical channel is a trapezoidal channel that is normally a 2-foot bottom with side slopes that are 2:1. The excavated material is used on the down slope.

Channel Construction Subtotal

Ditch Excavation		$
Channel Lining (Jute)		$
Channel Lining (High Velocity)		$
Channel With Rock Lining:	R3	$
	R4	$
	R5	$
	Geotextile	$
PVC Lining		$
Subsurface Drains		$_____
Subtotal =		$

POND REMOVAL

Ponds

Number of Ponds X Unit Cost = $

Rate includes removal of associated ditches.
Do not include ponds which are part of the post-mining land use and for which the landowner has signed a release.

OTHER ACTIVITIES

For required reclamation activities not shown above, such as wetland construction or reconstruction:

Determine the unit operations needed to accomplish the activity, the dimensions of the activity, materials and their amounts and multiply by an appropriate unit cost. Attach calculation sheets.

If no unit cost is available attach an independent, detailed estimate for performing the task. (Examples: Cost of alkaline addition materials, importation of soil cover material.)

SUBTOTAL

Backfilling	$
Topsoil Handling	$
Selective Grading	$
Revegetation With Topsoil	$
Revegetation Without Topsoil	$
Reforestation	$
Channel Construction Subtotal	$
Pond Removal	$
Other Activities $_____	
Subtotal =	$

INSTALLATION OF TEMPORARY EROSION & SEDIMENT CONTROLS

Subtotal ($) X Unit Cost = $

Calculate only when reclamation plan calls for temporary erosion & sediment controls after backfilling and grading. See BRG.

MOBILIZATION/DEMOBILIZATION

Subtotal ($) X Unit Cost = $

Required element of the bond amount.

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TOTAL BOND

Subtotal	**$**_____
+ Installation or upgrade E&S Controls	**$**_____
+ Mobilization/demobilization	**$**_____
+ Subtotal from Appendix C	**$**_____
Total =	**$**

Attach all worksheets and calculation pages used in determining bond amounts.

Attach Appendix C, "Bond Calculation Worksheet for Demolition of Structures and Mine Seals" if applicable.

Contact your Lead Permit Reviewer for assistance in completing this form.

APPENDIX D

Bond Calculation Worksheet for Demolition of Structures and Mine Seals

(Instructions in italics)

DEMOLITION OF STRUCTURES

Structure: volume (ft^3) X Unit Cost ($/$ft^3$) = $

Determine volume of each structure to be removed in cubic feet based on external dimensions. Use appropriate item and cost from an industry-standard cost estimation publication.
Include reference and page number with calculations.

Review Guide Confirm structures to be removed and calculations are appropriate for type of structure and cost.

SEALING MINE OPENINGS

Boreholes

Vertical Linear Feet (ft) of Borehole X $ /ft = $

Use solid concrete seals.
Use appropriate diameter, concrete purchase and placement costs from an industry-standard cost estimation publication.
Include reference and page number with calculation.

Review Guide
Verify length and check calculations.

Confirm calculation made is appropriate for type of structure and cost.

Shafts

Non-hydraulic shaft seal - Inert fill to surface, mound and fence:

Unit Cost + (vol. of fill X cost estimate) + Fencing = $

Calculate for each shaft.

Use appropriate unit cost from BRG. Use appropriate earth purchase and placement costs from an industry-standard cost estimation publication. Remember to include costs for fencing.
Fill must be inert and non-combustible.
Include reference and page number with calculation.

Review Guide Verify and check calculations.
Confirm calculation made is appropriate for type of shaft.

Hydraulic shaft seal with bulkhead; Backfill to surface, mound and fence:

Unit Cost + (vol. of fill X cost estimate) + Fencing = $

Use unit cost from BRG.
Use appropriate earth purchase and placement costs from an industry-standard cost estimation

Review Guide
Verify and check calculations.

publication. Remember to include costs for fencing.
Include reference and page number with calculation.

Confirm calculation made is appropriate for type of structure and cost.

Drifts and Slopes

Non-Hydraulic Seal; Backfill to surface, mound, and fence:

Unit Cost + (vol. of fill X cost estimate) + Fencing = $

Hydraulic seal; Backfill to surface, mound, and fence:

Unit Cost + (vol. of fill X cost estimate) + Fencing = $

Use unit cost from BRG. Use earth purchase and placement costs from an industry-standard cost estimation publication. Remember to include costs for fencing.
Include reference and page number with calculation.

Review Guide Verify and check calculations.

Confirm calculation made is appropriate for type of structure and cost.

Other Activities

For miscellaneous items such as Railroad Track and Tie removal, Piping, Conveyors, Macadam, Guide Rails, Electrical Transformers, Above or Underground Storage Tank Removal, and Disposal of Contaminated Soil, or for required reclamation activities not shown above:

Determine the dimensions of the activity and multiply by the appropriate costs from an industry-standard cost estimate publication. Attach calculation sheets.

If no BRG is available attach three independent estimates for performing the task. (Examples: Cost of alkaline addition materials, importation of soil covers material.)

SUBTOTAL

Demolition	$
Sealing mine openings	$
Other	$_____
Subtotal =	$

Add subtotal from this worksheet to Bond Calculation Worksheet for total bond amount.

Attach additional Worksheets and calculation pages as needed.

Contact your Lead Permit Reviewer for assistance in completing this form.

Do NOT submit bond until District Office has provided a 'Bond Submittal' form.