DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

DOCUMENT NUMBER: 563-2112-611

TITLE: Permitting Pre-existing Pollutional Discharges under Subchapter F of 25 Pa. Code Chapter 87, Subchapter G of 25 Pa. Code Chapter 88

EFFECTIVE DATE: November 7, 1997

AUTHORITY: Surface Mining Conservation and Reclamation Act

POLICY:
The Department will establish the required treatment level for pre-existing pollutional discharges for which special authorization has been requested under 25 Pa. Code, Chapter 87, Subchapter F or Chapter 88, Subchapter G. The required treatment level will be determined on a case-by-case basis through the application of best professional judgment (BPJ) as required by §§87.207 and 88.507 pertaining to the treatment of discharges.

PURPOSE:
The purpose of this guidance is to establish the methods and procedures for performing BPJ analysis to determine treatment requirements for pre-existing pollutional discharges authorized under Subchapters F and G and to provide guidance on writing permit conditions to establish appropriate effluent limits and other permit conditions. Because they are an integral part of the BPJ analysis, this guidance also establishes the procedures for establishing the baseline pollution load from pre-existing pollutional discharges and for evaluating the pollution abatement plan submitted in fulfillment of Subchapter F or G.

APPLICABILITY:
This remining policy shall apply to pre-existing pollutional discharge which are qualified for authorization under Subchapter F or G and Technical Guidance Document 563-2112-610.

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: 13

LOCATION: Vol. 12, Tab 78B (BMR PGM Section II, Part 6, Subpart 11)

TECHNICAL GUIDANCE:

BACKGROUND

The historical background of remining regulations under Subchapter F and G can be found in Technical Guidance Document 563-2112-610. It was determined by EPA that for a remining operation conducted under Subchapter F or G, the conventional coal mining BAT effluent limitations do not apply to pre-existing discharges, provided these discharges are not "encountered" by the mining operation. Therefore, effluent limits must be established on a case-by-case basis by the application of best professional judgment (BPJ) under Section 402(a)(1) of the Clean Water Act.

Best Professional Judgment (BPJ) is defined in §§87.202 and 88.502 as:

> "The highest quality technical opinion forming the basis for the terms and conditions of the treatment level required after consideration of all reasonably available and pertinent data. The treatment levels shall be established by the Department under Sections 301 and 402 of the Federal Water Pollutional Act (33 USC §§1311 and 1342)."

BPJ-determined effluent limits must be based upon the best available technology economically achievable (BAT) or any more stringent limitation necessary to ensure the discharge does not violate state in-stream water quality standards.

In essence, the BPJ analysis is a BAT analysis in miniature, specific to an individual mine site, rather than an entire class of industrial discharges (i.e., surface mining). For a remining permit under Subchapter F or G, the analysis should consider the cost of treatment to conventional surface mining BAT levels, as well as the cost of achieving pollution load reduction through the implementation of a pollution abatement plan. The permit writer can also consider any unique factors pertaining to the proposed remining operations and any potential adverse or beneficial non-water quality environmental impact.

Theoretically, BPJ-determined treatment levels can range from the pre-existing baseline level to the conventional BAT limits set forth at §§87.102, 88.92 or 88.187. BPJ analysis shall be applied to all pre-existing pollutional discharges for which Subchapter F or G authorization has been requested and is applicable under Technical Guidance Document 563-2112-610. BPJ analysis can be performed using the REMINE computer program. REMINE was developed by the Pennsylvania State University in cooperation with the Department and EPA. It was designed to provide the information needed to perform the BPJ analysis.

PROCEDURE

Any operator requesting Subchapter F or G authorization must complete Module 26 of the Coal Surface Mine Application. Portions of Module 26 may be completed by attaching print-outs from the REMINE computer program.

Eligibility Information

Modules 26.1, 26.2, and 26.3 must be completed in order to satisfy the basic eligibility requirements and to allow the reviewer to determine if the proposed operation qualifies as a remining operation eligible for Subchapter F or G authorization. Refer to Technical Guidance Document 563-2112-610 for eligibility criteria. Also, the information in surface mine permit application Modules 26.1 and 26.2 is needed for statistical purposes.

Remining Map and Pollution Abatement Area - Exhibit 26.4

The remining map can either be prepared as a separate exhibit or can be combined with Exhibit 9 in accordance with the Module 26.4 instructions. The pollution abatement area is the part of the permit area which is causing or contributing to the baseline pollution load. It shall include adjacent areas that must be affected to bring about significant improvement of the baseline pollution load, and may include the immediate location of the discharges. The pollution abatement area may cover the entire permit area or only a portion of it. It is critical that the boundaries of the pollution abatement area be clearly delineated because the Subchapter F or G regulations include special provisions for revegetation standards and bond release within the pollution abatement area. In addition, all activities intended to improve the baseline pollution load must be conducted within this area.

The remining map must also show the location of all Subchapter F or G discharges as well as their respective monitoring locations. It is not necessary for these discharges to be located within the boundaries of the surface mine permit (SMP). However, all monitoring point locations must lie within a property for which a landowner consent form ("Supplemental C") has been submitted. Alternatively, the applicant may submit notarized permission from the landowner confirming agreement for continued access for monitoring.

Hydrologic unit boundaries must be shown for situations where two or more discharges are to be aggregated for load calculations. The remining map must also show abatement plan elements including areas of special mining or abatement practices, all previously mined areas, and auxiliary water treatment facilities to be employed in the event that the Subchapter F or G discharges require treatment. Refer to Module 26.4 for the specific list of items required to be shown on the remining exhibit map.

Baseline Pollution Load - Module 26.5

Pollution Load:

Pollution load is the quantity of a specific pollutional material being discharged, expressed in terms of mass/time. It is usually expressed in pounds per day although other units could be used. The loading rate in pounds per day can be obtained using the following formula:

$$\underset{(\text{lbs/day})}{\text{Pollution Load}} = \underset{(\text{mg/l})}{\text{Concentration}} \times \underset{(\text{gals/min})}{\text{Flow}} \times 0.01202$$

$$(\text{kg/day}) = \text{Concentration} \times (\text{l/min}) \times 1.4$$

Because discharges tend to naturally vary in quality and quantity, both seasonally and in response to recharge events, the baseline pollution load is expressed as a statistical summary rather than a single number. Load calculations should include acidity (use net acidity if alkalinity is greater than zero), iron, manganese, and aluminum. The determination of a baseline loading rate for a particular parameter does not necessarily mean that a loading limit will be applied to that parameter.

All discharges for which Subchapter F or G authorization is requested must be inventoried and described by the applicant on Module 26.5A.

Encountered vs. Not-Encountered Discharges:

The applicant must identify if the discharge will be "encountered" during the course of mining operations. A discharge shall be deemed as "encountered" when it will be physically encountered in the course of active surface mining activities, including but not limited to overburden removal, coal extraction, and backfilling, or when the discharge will occur in the pit, sedimentation or treatment pond, or as any mining related conveyance except as specifically exempted under §§87.105(b)-(g) and 88.505(b)-(g). While the BPJ-determined effluent standard only applies to discharges which are not encountered, baseline pollution load and BPJ treatment limits will also be determined for discharges to be encountered. During the period when a discharge is encountered, the conventional mine drainage effluent standards shall apply. A discharge which has been "encountered," as defined above, will be considered "not-encountered" when the area which has been disturbed and which contributes to the discharge has been backfilled and regraded, and revegetation work has commenced.

Hydrologic Units and Combined Discharges:

In many cases, pre-existing pollutional discharges may occur in the form of numerous discharge points, all of which emanate from a hydrologically discrete groundwater flow system. Groundwater flow paths may change during and following remining such that new discharge points appear, former discharge points disappear, and/or the distribution of flow rates between discharges changes. Where this situation is likely to occur, it is usually advantageous to designate hydrologic units. Each unit must be a hydrologically discrete area such that groundwater from one hydrologic unit does not flow to a different hydrologic unit.

Discharges may be combined either naturally or by man-made controls to a single monitoring point, provided that the combination of discharges does not affect the pollution load measurement and that discharges from different hydrologic units are not combined. It is usually desirable both from the standpoint of cost to the operator and in terms of permit writing and compliance monitoring, for the applicant to minimize the number of monitoring points needed.

Baseline Sampling Requirements:

In order to establish a statistically valid baseline pollution load, the following minimum sampling requirements must be met:

1. Samples must be collected and analyzed for pH, alkalinity, acidity, total iron, total manganese, total aluminum, sulfates, total suspended solids, and any other relevant water quality parameters.

2. Discharge measurements must be made either by measuring the actual volume (where appropriate) or by a permanently installed, properly constructed and maintained weir, flume, or other suitable flow measuring device. The monitoring locations and any flow measuring devices should be examined during the pre-application field meeting or as early into the application review as possible to minimize the need for lengthy baseline data collection periods.

3. Water quality samples must be collected at intervals no greater than one month apart. A consistent sampling interval (such as monthly or biweekly) should be followed. When the sampling interval used is inconsistent, the largest interval should be used in calculating the baseline. When two or more samples are collected within the interval, the loading rates should be averaged to represent a single value for that sampling interval. For example, the applicant has been sampling monthly but for some period of time has collected two samples each month. To avoid giving too much weight to the two-sample months, the two individual loading rates for the month should be averaged to represent a composite pollution load for that month. Alternately, to avoid over-centralizing the data, a single sample may be used for each multi-sample interval provided that a consistent sample for each interval is chosen. For example, the first sample collected during the interval is always used.

4. The baseline sampling period should cover at least a full water year. For discharges which remain fairly constant in quality and quantity, a shorter sampling period which includes the period from February through October may be accepted, i.e., November, December and January may be omitted, because these months tend to approximate average conditions. Once baseline monitoring begins, it should proceed continuously prior to application submittal and throughout the duration of the permit review. Although a permit application can be submitted with as few as three months of water monitoring data, monitoring must continue until a sufficient baseline monitoring period has elapsed.

5. If the baseline monitoring period exceeds a year, the reviewer should carefully select the monitoring period to be used in establishing the baseline pollution load, to ensure that seasonal low-flow or high-flow conditions are not over-represented or under-represented. The easiest way to do this is to use a continuous monitoring period which consists of entire water years. However, partial years that exclude November, December, or January can also be considered. Do not select a baseline period, for example, of two high-flow seasons and one low-flow season.

6. A zero flow represents zero load for that sample date and should be included with the baseline data. However, discharges which are dry more often than flowing may be characterized using only the data from periods of flow.

Baseline Statistics:

The exploratory data analysis techniques developed by John Tukey and used in REMINE will be accepted as a statistical baseline pollution load summary. Alternative statistical parameters may be used in place of the parameters identified on Module 26.5(c), provided that the applicant demonstrates that the alternative parameters are statistically valid and applicable. For example, conventional statistical parameters (mean, 95th percentiles, etc.) may be used if the data are normally distributed.

While the permit applicant is responsible to submit the baseline pollution load data and statistical summary, the reviewer should check the calculations to ensure that the summary results are correct. In addition, the reviewer should examine the distribution of the data to determine whether a logarithmic transformation is appropriate. If logarithmic transformation results in a more normal distribution curve (this can be examined by eyeballing the frequency histograms printed out by REMINE), log-transformed data should be used in determining the baseline. For future analysis in compliance monitoring and bond release, the baseline data should be retained.

Where more (or in some cases, fewer) than 12 baseline data points are being used, and the monitoring frequency required in the issued permit will be monthly, such that examination of postmining data will involve very different sample sizes, the baseline statistics may be calculated using N=12. This improves the comparison of premining and postmining data and prevents the applicant from being penalized (by narrower confidence intervals) for increasing the baseline monitoring period or the frequency of sampling. In general, longer or more frequent baseline sampling provides a more valid statistical summary and is more likely to adequately represent the entire range of pollution load fluctuations.

The applicant must perform the baseline pollution load statistical summary for each monitoring point. Where multi-discharge hydrologic units are defined, the baseline statistics should be calculated for the aggregate pollution load from each monitoring point, individually summed for each sample date. This requires sampling and analysis of each discharge on the same date with the same number of samples. The baseline pollution load is then reported for the combined pollution load from the hydrologic unit.

Pollution Abatement Plan - Module 26.6

Applications for authorization under Subchapter F or G must include a pollution abatement plan that represents best technology (under §§87.204(3) and 88.504(3)). Module 26.6 outlines the requirements for the pollution abatement plan, which must include one or more best management practices (BMPs). The abatement plan must include the implementation cost, which will be used in performing the BPJ analysis. The implementation cost can be calculated by using the Penn State Open Pit Materials Handling Simulator and Cost Model (OPMHS/Cost), which is part of REMINE, or in limited situations it can be estimated by calculating individual costs for each BMP using the guidance in Module 26.6.

The pollution abatement plan must describe the anticipated impact on the pre-existing pollutional discharges. This may include effects on infiltration, evapotranspiration, water quality improvements, and any other anticipated pollution reduction benefits resulting from implementation of the abatement plan. The reviewer must make a determination as to whether or not this plan represents the best technology which is economically achievable given the site conditions, the coal resources, and the mining operation. To constitute best technology, the abatement plan must maximize the pollution reduction benefits while still being economically achievable as part of a coal mining operation.

OPMHS/Cost Model:

The OPMHS/Cost model evaluates the cost of the entire mining operation in terms of the required in-pit coal selling cost necessary to obtain a specified return on investment. It is also possible to evaluate the added costs of pollution abatement (which are in addition to abatement activities that are an integral part of the mining operation) by simulating the mining operation both with and without abatement. The cost differential equals the added cost of abatement. Refer to the REMINE manual for specific instructions on running OPMHS/Cost. If the applicant uses REMINE for cost analysis of the pollution abatement plan, a disk containing all of the input data must be included with the application.

Unless justification is provided, OPMHS/Cost should be run using default values. The applicant must select the equipment list and indicate its condition (new, used, or fully depreciated), input haul path information (truck/shovel operations), and identify additional costs of any BMPs which are not an integral part of the mining operation (such as alkaline addition, wetlands, anoxic drains, etc.). The applicant must also estimate the total volume of overburden to be handled. This is determined by multiplying the average cover by the mining area and then including the swell factor (add 20% unless a different number is justified) and any yardage which must be rehandled. OPMHS will determine the overburden production per shift. The life of the mine in years, which is entered into the cost model, must be consistent with the required overburden production. The reviewer must check the simulated life-of-mine to be sure that it corresponds to the amount of overburden which must be handled.

The final output from the cost model will show the required in-pit coal selling price. If the baseline pollution load was calculated, it will also indicate the required selling price if 50-year treatment to conventional effluent limits is required.

Module 26.6 Worksheet:

If the applicant elects to calculate pollution abatement costs manually using the Module 26.6 worksheet, the implementation cost should be reviewed for reasonableness and consistency. Where implementation costs appear unreasonable or are unsupported, additional documentation should be required. Some items, such as daylighting of underground mines, are an integral part of the mining operation and are not amenable to calculation as a separate costs. In these circumstances, the abatement cost worksheet only considers the added cost of daylighting which can be calculated separately from the mining operation such as the relatively minor added cost of cleaning coal pillars prior to coal removal.

Revegetation - Module 26.7

The standard of success for revegetation for the pollution abatement area must meet the requirements of §§87.205(5) and 88.505(5). If a standard for success other than the conventional success standard of §§87.155 and 88.129 will be used, it should be described in this Module. Otherwise, the standard criteria will apply.

Treatment Costs - Module 26.8

The BPJ analysis requires consideration of the costs of long-term (50-year) treatment to conventional (§§87.102 and 88.92) standards. To calculate treatment costs, each discharge subject to Subchapter F or G authorization should be assigned to a treatment unit defined as single discharge or group of discharges which can be conveyed to and treated at an individual treatment facility. A treatment plan must be proposed for each treatable unit. In some cases, it may be possible to incorporate the treatment facilities which would normally accompany the surface mining operation into the plan, provided that the design capacity is adequate. Where auxiliary facilities would be needed, appropriate design criteria, dimensions, capacities, equipment requirements, and treatment reagents should be included in the plan.

The principal purpose of the treatment plan is to estimate the cost of treatment by conventional methods. REMINE will calculate an approximate treatment cost based on a typical treatment system for the flow rates shown by the baseline data. If REMINE is used, the applicant need only attach the REMINE treatment cost calculations. For applicants not using REMINE, a treatment cost schedule (Module 26.8A) is provided to assist in performing cost calculations and should be completed for each treatment unit. Treatment cost calculations are based on the mean flow and loading rates. Actual construction of facilities and implementation of treatment plans will depend upon the outcome of the BPJ analysis. Where the effluent limit is determined to be baseline, no facility need be constructed unless the pollution load increases. In this case, the actual treatment facility may be redesigned to reflect the actual level of treatment which is required.

Capital Costs: Facility and construction costs (capital costs) include construction of treatment basins as well as equipment costs such as tanks, mixers, dispensers, chemical feeders, aerators, conveyance, structures, etc. Construction and equipment costs should be calculated on an actual-cost, item-by-item basis. Treatment facility proposals should show sufficient sludge storage and minimum detention times consistent with conventional permitted hfacilities.

It is assumed that treatment plant operating life will be 25 years. Therefore, capital must be available at that time to reconstruct the facility. Inflation will increase the cost; so the amount of money needed in 25 years will be more than the current capital cost. But, money, set aside today, will earn interest which must also be considered. The interest formula to account for the time value of money is:

$$PV_{cap} = C[(1+E)/(1+i)]^n$$

where:

PV_{cap} = present value of capital costs
C = capital costs
i = interest rate (8%)
E = inflation rate (5%)
n = replacement period (25 years)

Substituting the appropriate values in the above equation, the Present Value of the capital cost = 0.494 C.

Annual Operating and Maintenance Cost: Treatment facility operation and maintenance costs can vary widely depending on the type of system being used, its location, the quantity of sludge which will be generated and other factors. Consequently, the costs analysis can only be divided into broad categories for labor, maintenance, sludge disposal and power. Any unusual cost estimates should be supported with more detailed documentation.

Reagent costs are dependent upon the reagent being used, its efficiency (i.e., the percentage of its neutralizing capability which is liberated during treatment) and the purity of the reagent. Table 1 shows stoichiometric equivalence factors and optimal purity and efficiency factors. Other factors can be substituted provided that supporting documentation (test results, etc.) is submitted with the application. Cost figures should be obtained by the applicant from current suppliers; however, in the absence of quoted prices the values in Table 1 will be acceptable.

The costs discussed above are best estimates and contain some uncertainty. Prudent engineering estimating adds a contingency amount to estimated costs to account for uncertainty. A 15% factor is to be added to the operation and maintenance cost for this contingency.

The present value of the operation and maintenance cost (A) is the sum of (Annual Operating & Maintenance Cost) + (Reagent Cost) + (Contingency). The Present Value of these costs are calculated from the following equation:

$$PV_{om} = A(1+i)[(1-(1+E/1+i)^{n})/(i-E)]$$

where: PV_{om} = Present value O&M cost

A = annual O&M costs

i = interest rate (8%)

E = inflation rate (5%)

n = Treatment period (50 years)

Substituting the appropriate values in the above equation, the Present Value of the O&M cost = 27.2 A.

Total Cost Calculation: Total long-term (50-year) treatment cost is the sum of the initial cost to construct the treatment facility or facilities, the present value of constructing a replacement facility in 25 years and the present value of 50 years of operation and maintenance costs.

50-year treatment cost = Initial Capital Cost + PV_{cap} + PV_{om}

50-year treatment cost = C + 0.494C + 27.2A

TABLE 1
REAGENT REQUIREMENTS[1]

Reagent	Chemical Formula	Stoichiometric Equivalence	Approx. Purity Factor	Alkali Efficiency Factor	Cost[2] Cents/Lb.
Limestone	$CaCO_3$	1.00	0.95	0.5-0.8[3]	4
Quicklime	CaO	0.56	0.92	0.90	16
Hydrated Lime	$Ca(OH)_2$	0.74	0.96	0.99	12
Caustic Soda	NaOH	0.80	0.99	0.99	18
Soda Ash	$Na2CO_3$	1.06	0.99	0.99	17[4]

Notes: [1]Modified from: Lovell, Harold L., 1973, An appraisal of neutralization processes to treat coal mine drainage, U.S. Environmental Protection Agency, EPA-670/2-73-093. Also in: April 15, 1971 Mine Drainage Research Section Newsletter, College of Earth and Mineral Sciences, and in Fundamentals of Water Pollution Control in Coal Mining course notes, Mineral Engineering Continuing Education, the Pennsylvania State University, University Park, PA.

[2]Cost in 1997 dollars for bagged reagent, excluding delivery. Applicant should use actual cost from supplier delivered to treatment site.

[3]Pulverized limestone added to influent water. Due to the limited solubility of limestone, efficiency varies depending on mixing equipment used.

[4]50% solution in 55 gallon drums (multiply by 2 for actual cost).

The reagent purity factor can vary depending on the reagent source. Purity analysis will generally be indicated by the producer. Efficiency factor is a variable which depends on many factors, the most important of which is alkali solubility. Generally, if the alkali is not added as a solution in water, the efficiency is quite low. The above values are the average under the best conditions. Reagent costs can vary widely depending on the source, transportation distance and vendor. The above values may be considered as typical, however, each operator will know his own cost per pound.

Remining Cost Summary and BPJ Analysis - Module 26.10

As part of the criteria for Subchapter F or G eligibility as well as the BPJ analysis, the reviewer must determine that the proposed pollution abatement plan has the potential to effect a water quality improvement. The applicant must also demonstrate that the proposed mining will not result in additional groundwater degradation on the pollution abatement area or in additional surface water pollution.

Most of the BPJ analysis focuses on the costs of providing long-term treatment to conventional effluent limits and in determining whether or not the pollution abatement plan represents best technology. Since the abatement measures employed represent at-source treatment, both the cost of implementing the abatement plan and long-term treatment costs can be considered. To facilitate cost comparison, abatement plan and treatment costs are expressed as the unit cost per ton of coal to be mined. (Module 26.10).

In performing the BPJ analysis, two principal questions must be posed by the reviewer: (1) is conventional treatment to BAT effluent standards economically achievable and (2) does the proposed abatement plan represent best technology? If the cost of conventional treatment singularly or in combination with the proposed pollution abatement plan is economically achievable, then conventional coal mining effluent standards become the applicable effluent limitation. Although Subchapter F or G authorization could still be issued under these circumstances, none of the incentives would come into play.

Provided that "perpetual" treatment is not economically feasible, the abatement plan becomes the principal focus of the BPJ analysis. The pollution abatement plan must include one or more best management practices or BMPs. If the proposed abatement plan can be technologically improved, while still being economically achievable, it should be revised to include or upgrade one or more BMPs. To cite examples, possible abatement plan revisions include regrading of additional unregraded spoils, complete (as opposed to partial) daylighting, additional revegetation, increased alkaline addition, etc. Revised abatement plan costs shall be calculated by the applicant and reevaluated by the reviewer.

If the initial abatement plan proposal is the best possible or most appropriate plan for the site, then the abatement plan represents best technology and the applicable effluent limit becomes baseline (i.e., no additional treatment or abatement measures are required). In some cases, however, the level of abatement required is dictated by the economics of the mining operation. Where a higher level of pollution abatement is technically possible, the analysis must consider whether or not the abatement is the best technology economically achievable for the site. In the absence of any extenuating circumstances or unique conditions, abatement proposals which cost less then $1.00 per ton of coal are generally considered to be economically achievable.

What constitutes best abatement technology, however, may depend on the economics of the overall mining operation rather than just the cost of implementing the abatement plan. Therefore, while the Module 26.6 worksheet is appropriate and will be acceptable for most mining scenarios, the applicant may elect or the Department may require the economics of the overall mining operation to be modeled using REMINE or other appropriate technique. REMINE can be used both to show the required selling price of the coal for a given return on investment, given a modeled abatement scenario, or it can be used to show the required selling price differential both with and without pollution abatement. Although an applicant could opt for partial treatment of a pre-existing discharge above the baseline level, the BPJ process is oriented toward ensuring that the abatement plan represents best technology, thereby achieving abatement rather than long-term treatment.

Whether or not treatment or abatement is economically feasible, of course, varies from site-to-site, depending on coal quality and markets, site conditions and other factors. Consequently, the professional judgment of the reviewer must be applied. A final consideration in the BPJ analysis is the presence of any unique factors pertaining to the remining operation which could enhance or impede implementation of the abatement and/or treatment plan, or any adverse or beneficial non-water quality impacts which will result from the operation. Since these are unique factors, it is impossible to list general guidelines applicable to all situations, however, a possible example is given for clarification: Non-water quality environmental improvements such as reclamation of unreclaimed areas or highwall elimination can also be considered in lieu of conventional treatment where the abatement plan has been demonstrated to be of the best technology but it is uncertain that a significant water quality improvement can be effected.

Accelerated BPJ Process:

Since Pennsylvania's Subchapter F program was implemented in 1986, over 250 Subchapter F permits have been issued. In the majority of these cases, the pollution abatement plan has been deemed best technology and effluent limits have been determined, through BPJ, to be baseline. In a minority of cases, the applicant has been required to upgrade the abatement plan or demonstrate that an upgraded plan is not economically achievable. Therefore, in order to expedite processing of applications for Subchapter F authorizations, the following guidelines can be used to identify abatement plans which represent best technology and will require no economic analysis on the part of the applicant. An abatement plan which does not meet any of the following guidelines must be accompanied by an economic analysis.

Guidelines for Best Technology Abatement Plans (No Economic Analysis Required):

1. Over 30% of the entire affected area of the SMP is composed of unregraded or unvegetated spoils which will be regraded and revegetated.

2. Complete daylighting of underground mine workings which underlie at least 20% of the area to be affected or partial daylighting on at least 30% of the area to be affected.

3. Any combination of regrading and revegetation of unreclaimed spoil and daylighting which covers at least 30% of the area to be affected.

4. Importation of alkaline materials at a rate which exceeds the quantative alkaline addition requirements specified in the alkaline addition program guidance by at least 300 tons/acre (133.5 tonnes/hectares) $CaCO_3$ equivalent over the entire area to be affected.

5. Elimination of at least 1,000 feet (304.8 meters) of abandoned highwall per 100 acres (40 hectares) affected.

6. Construction of appropriately sized and designed passive treatment devices on pre-existing discharges.

Abatement plans which meet any of these criteria are not required to complete the abatement plan cost analysis, long-term treatment cost analysis, Module 26.9, and Module 26.10 and are deemed to satisfy the best technology requirement.

<u>Application of Effluent Section Parameters and Limits</u>

At a minimum, all Subchapter F or G authorizations must include acidity (or net acidity) and iron as loading-based effluent limitations. Manganese and aluminum (when required) shall be included as a load-based effluent limit whenever the premining concentration exceeds conventional treatment levels (2.0/4.0 mg/l) and the receiving stream has a viable aquatic community or other use which requires application of manganese or aluminum effluent limitations. However, if baseline iron and/or manganese concentrations do not exceed conventional effluent limits, the applicant may elect conventional concentration limits for those parameters. The concentration limits are in effect at all times, regardless of whether the baseline pollution load has been exceeded for loading-limited parameters.

Loading-based effluent limits which are applied to parameters triggered by exceedences above the baseline will be as follows:

Average monthly = median value rounded down to two significant figures.

Daily/instantaneous maximum = upper quartile value rounded down to two significant figures.

These standards only apply when the baseline pollution load has been exceeded using the trigger criteria set forth in the permit conditions.

Permit Write-up:

Effluent limitations and conditions under Subchapters F or G will be authorized in Part A, Section 1D of the Coal Surface Mining Permit (SMP) form 5600-PM-MR0310A. Additional special conditions in Part B of this form should be applied as needed to any particular aspect of the permit.

The appropriate values must be placed in Tables D1, D2 and D3 of Part A, Section 1D of the Coal Surface Mining Permit (SMP) form 5600-PM-MR0310A.

Table D1 represents the critical values that will trigger accelerated sampling. These values represent the 95% tolerance limit of the baseline pollution load. Insert an asterisk if the operator has chosen conventional effluent limits for a parameter.

Table D2 represents the approximate 95% confidence interval about the median pollution load and is to be used for subtle trigger comparisons of water years.

Table D3 is the BPJ effluent limits. If an operator chooses conventional effluent limits for a given parameter, an asterisk is placed in the appropriate location in the table.