Annex A
TITLE 25. ENVIRONMENTAL PROTECTION
PART I. DEPARTMENT OF ENVIRONMENTAL PROTECTION
Subpart C. PROTECTION OF NATURAL RESOURCES
ARTICLE I. LAND RESOURCES
CHAPTER 87. SURFACE MINING OF COAL

* * * * *

Subchapter F. SURFACE COAL MINES: MINIMUM REQUIREMENTS FOR REMINING AREAS WITH POLLUTIONAL DISCHARGES

* * * * *

§ 87.202. Definitions.

The following words and terms, when used in this subchapter, have the following meanings, unless the context clearly indicates otherwise:

***[Abatement plan*—An individual technique or combination of techniques, the implementation of which will result in reduction of the baseline pollution load. Abatement techniques include but are not limited to: Addition of alkaline material, special plans for managing toxic and acid forming material, regrading, revegetation and daylighting.]**

* * * * *

Best technology—Measures and practices which will abate or ameliorate to the maximum extent possible pollutional discharges from or on the pollution abatement area. These measures include engineering, geochemical or other applicable practices.

***Coal remining operation* -- a coal mining operation at a site on which coal mining was previously conducted and where the site has been abandoned or the performance bond has been forfeited.**

***Encountered Discharge* -- A preexisting discharge intercepted in the course of active surface mining activities, including but not limited to overburden removal, coal extraction and backfilling, or that occurs in the pit, any mining-related conveyance, sedimentation pond or treatment pond. Encountered discharges do not include diversions of surface water and shallow groundwater flow from areas undisturbed by the implementation of the pollution abatement plan which would otherwise drain into the affected area so long as they are designed, operated and maintained in accordance with § 87.105(b)-(g).**

Pollution abatement area—The part of the permit area which is causing or contributing to the baseline pollution load, which shall include adjacent and nearby areas that must be affected to

bring about significant improvement of the baseline pollution load, and which may include the immediate location of the discharges.

***Pollution abatement plan*—Best management practices (BMPs), that include but are not limited to: addition of alkaline material, special handling plans for managing toxic and acid forming material, regrading, revegetation and daylighting, that when implemented will result in reduction of the baseline pollution load.**

***Pre-existing discharge* -- any discharge resulting from mining activities that have been abandoned prior to the time of a remining permit application. This term shall include a pre-existing discharge that is relocated as a result of the implementation of best management practices (BMPs) contained in the pollution abatement plan.**

***Steep slope* -- any slope, including abandoned mine land features, above twenty degrees or such lesser slope as may be defined by the Department after consideration of soil, climate, and other characteristics of a region. This term does not apply to those situations in which an operator is mining on flat or gently rolling terrain, on which an occasional steep slope is encountered and through which the mining operation is to proceed, leaving a plain or predominantly flat area.**

§ 87.203. Applicability.

* * * * *

(c) This subchapter applies to pre-existing discharges that are located within or are hydrologically connected to pollution abatement areas of a coal remining operation.

(d) Where coal remining operations seek reissuance of an existing remining permit with best professional judgment limitations and the Department determines that it is not feasible for a remining operator to re-establish baseline pollutant levels in accordance with the statistical procedures contained in this subchapter, pre-existing discharge limitations at existing remining operations shall remain subject to baseline pollutant levels established during the original permit application.

§ 87.204. Application for authorization.

(a) An operator who requests authorization under this subchapter shall comply with the permit application requirements of Chapter 86 (relating to surface and underground coal mining: general) and Subchapters A and C—E, except as specifically modified by this subchapter. The operator shall also:

(1) Delineate on a map the proposed pollution abatement area, including the location of the pre-existing discharges.

(2) Provide a description of the hydrologic balance for the proposed pollution abatement area that includes:

(i) Results of a detailed water quality and quantity monitoring program, including seasonal variations, variations in response to precipitation events and modeled baseline pollution loads using this monitoring program.

(ii) Monitoring for **flow,** pH, alkalinity, acidity, total iron, total manganese, **total** aluminum, sulfates, total suspended solids and other water quality parameters the Department deems relevant.

(3) Provide a **[description of the] pollution** abatement plan **[that represents best technology and includes] which shall:**

(i) **Describe the pollution abatement area.**

(ii) Be designed to reduce the pollution load from pre-existing discharges and identify the selected best management practices (BMPs) to be used.

(iii) Describe the design specifications, construction specifications, maintenance schedules, criteria for monitoring and inspection, and expected performance of the BMPs.

(iv) represent best technology and include:

(**A[i]**) Plans, cross-sections and schematic drawings describing the abatement plan proposed to be implemented.

(**B[ii]**) A description and explanation of the range of abatement level that probably can be achieved, costs and each step in the proposed abatement plan.

(**C[iii]**) A description of the standard of success for revegetation necessary to insure success of the abatement plan.

(v) Provide a description of and information on the preexisting discharges hydrogeologically connected to the remining area.

(4) Determine the baseline pollution load.

(5) Provide the background data that are the bases for the baseline pollution load. The baseline pollution load shall be reported in lbs/day.

(b) The operator seeking this authorization **[shall]may** continue the water quality and quantity monitoring program required by subsection (a)(2) after making the authorization request. The operator **[shall]may** submit the results of this continuing monitoring program to the Department on a monthly basis until a decision on the authorization request is made.

* * * * *

§ 87.206. Operational requirements.

An operator who receives an authorization under this subchapter shall comply with the requirements of Chapter 86 (relating to surface and underground coal mining: general) and Subchapters A and C—E except as specifically modified by this subchapter. The operator shall also:

(1) Implement the approved water quality and quantity monitoring program for the pollution abatement area until the requirements of § 87.209 (relating to criteria and schedule for release of bonds on pollution abatement areas) are met. **The monitoring program shall conform to the following:**

(i) Sampling shall be conducted on a monthly basis for the preexisting discharges and should adequately represent the seasonal range in loading rates as well as the median loading rate from each pre-existing discharge or combination of discharges.

(ii) Results shall be submitted on a quarterly basis

(iii) Data shall include the flow measurements and loading calculations.

(2) Implement the approved **pollution** abatement plan.

(3) **[Notify the Department immediately prior to the completion of each step of the abatement plan.**

(4) Provide progress reports to the Department within 30 days after the completion of each step of the abatement program that include a notarized statement signed by the operator, and if required by the Department, a statement signed by the supervising engineer, that all work has been performed in accordance with the terms and conditions of the pollution abatement authorization, the approved maps, plans, profiles and specifications.]

Notify the Department when more frequent sampling is required.

(a) Weekly sampling of the preexisting discharges shall begin if any two consecutive monthly samples of pollution load at any of the monitoring points or hydrologic units exceed one or more of the triggers established by the baseline data.

(b) Weekly sampling requirements shall continue until two consecutive weekly sample analyses indicate that all parameters which triggered weekly sampling have dropped below the trigger established by the baseline data.

§ 87.207. Treatment of discharges.

(a) Except for preexisting discharges which are not encountered during mining or the implementation of the abatement plan, the operator shall comply with § 87.102 (relating to hydrologic balance: effluent standards).

(b) **Except as provided under § 87.210 (d), relating to discharges for which baseline pollution load cannot be established, the**[The] operator shall treat the preexisting discharges which are not encountered during mining or implementation of the abatement plan to comply with the effluent limitations established by best professional judgment. The effluent limitations established by best professional judgment may not be less than the baseline pollution load. If the baseline pollution load, when expressed as a concentration for a specific parameter, satisfies the effluent limitations at § 87.102 for that parameter, the operator shall treat the preexisting discharge for that parameter to comply with either effluent limitations established by best professional judgment or the effluent limitations at § 87.102.

* * * * *

(g) If four (4) consecutive weekly determinations of pollution load, as required under § 86.206(3)(a), exceed one or more triggers, the permittee shall notify the Department and commence treatment within thirty (30) days of the fourth sample in accordance with the treatment limits established in the permit.

(h) If the Department determines, through analysis of any data submitted pursuant to the monitoring requirements or any data collected by the Department that there has been pollution loading degradation at any of the monitoring points or hydrologic units, the Department will notify the permittee accordingly. The permittee shall then commence treatment within thirty (30) days, in accordance with the treatment limits established in the permit.

(i) Any pre-existing pollutional discharge which is an encountered discharge shall be treated to the effluent limitations set forth in the permit until such time as the discharge is no longer encountered.

(j) For the purposes of determining applicable effluent limitations, a discharge shall continue to be deemed to be an encountered discharge until such time as the surface mining area which has been disturbed and which contributes to the discharge has been backfilled and regraded, and revegetation work has commenced.

* * * * *

§ 87.210 Effluent limitations

(a) The pollution abatement plan for the pollution abatement area must be approved by the Department and incorporated into the permit as an effluent limitation.

(b)The best management practices (BMPs) in the pollution abatement plan must be implemented as specified in the plan.

(c) (1) Except as provided in subsection (d) of this section, the following effluent limits apply to pre-existing discharges:

Parameter	Effluent Limit
Total Iron	May not exceed baseline loadings (as determined by this subchapter)
Total Manganese	May not exceed baseline loadings (as determined by this subchapter)
Acidity, Net	May not exceed baseline loadings (as determined by this subchapter)
Suspended Solids	During remining and reclamation, may not exceed baseline loadings (as determined by this subchapter). Prior to bond release, the pre-existing discharge must meet the applicable standards for Suspended Solids or Settleable Solids at § 87.102.

(2) A pre-existing discharge is exempt from meeting standards in § 87.102 for Suspended Solids and Settleable Solids when the Department determines that the standards are infeasible or impractical based on the site-specific conditions of soil, climate, topography, steep slopes, or other baseline conditions provided that the operator demonstrates that significant reductions of Suspended Solids and Settleable Solids will be achieved through the incorporation of sediment control BMPs into the pollution abatement plan as required by subsection (a) of this section.

(d) (1)If the Department determines that it is infeasible to collect samples for establishing the baseline pollutant levels pursuant to this subsection, and that remining will result in significant improvement that would not otherwise occur, then the permit applicant may establish an in-stream baseline concentration at a suitable point downstream from the remining operation and the numeric effluent limitations in subsection (c)(1) of this section do not apply.

(2) The in-stream baseline period shall include, at a minimum, twice monthly monitoring for a minimum of a one-year period and shall adequately represent the seasonal range and median pollutant concentrations.

(3) Upon issuance of a surface mining permit, the operator will continue, at a minimum, monthly monitoring of pollutant concentrations at the in-stream monitoring point referenced in subsection (d)(1), and make a determination as to whether or not there has been degradation of in-stream water quality.

(i) This determination shall be made on a quarterly basis and for each year defined as each consecutive 12-month period.

(ii) The operator is not required to treat individual preexisting sources of pollution except as may be needed to maintain the in-stream baseline concentration.

(iii) Unless the operator can demonstrate to the satisfaction of the Department that the degradation was the result of factors that are not related to the remining , the operator shall treat one or more preexisting pollutional discharges or undertake other pollution abatement measures to restore or improve the in-stream pollutant concentration to its baseline conditions .

(4) Pre-existing discharges for which it is infeasible to collect samples for determination of baseline pollutant levels include, but are not limited to:

(i) Discharges that exist as a diffuse groundwater flow that cannot be assessed via collection of samples.

(ii) A base flow to a receiving stream that cannot be monitored separate from the receiving stream.

(iii) A discharge on a steep or hazardous slope that is inaccessible for sample collection.

(iv) A number of pre-existing discharges so extensive that monitoring of individual discharges is infeasible.

(5) Where in-stream monitoring are not indicative of the impact of remining, the in-stream monitoring requirement may be waived by the Department. In-stream monitoring is not indicative of the impact of remining in circumstances including, but not limited to the following:

(i) Remining sites in drainage areas exceeding 10 square miles.

(ii) Remining sites in watersheds where there are other influences on the in-stream water quality that make it impossible to establish the cause of water quality changes.

(iii)Remining sites where the $Q_{7\text{-}10}$ stream flow is zero.

(e) Pollutants for which there are not effluent limitations established in § 87.102 may be eligible for limits established under this subchapter.

(f) The provisions of § 87.102 (relating to Hydrologic balance: effluent standards) apply to:

(1) A pre-existing discharge that is intercepted by surface mining activities.

(2) A pre-existing discharge that is commingled with waste streams from operational areas for the purposes of water treatment.

(g) The provisions of § 87.102 (relating to Hydrologic balance: effluent standards) cease to apply to a pre-existing discharge described in subsection (f) when the pre-existing discharge is no longer intercepted by surface mining activities or is no longer commingled with waste streams from operational areas for the purposes of water treatment.

(h) The effluent limitations in this subchapter apply to pre-existing discharges until bond release under the procedures in Chapter 86.

§ 87.211 Baseline Determination and Compliance Monitoring for Pre-existing Discharges at Remining Operations.

(a) The procedures described in this section shall be used for determining site-specific, baseline pollutant loadings, and for determining whether discharge loadings during coal remining operations have exceeded the baseline loading. Both a monthly (single-observation) procedure and an annual procedure shall be applied.

(b) At least one sample result per month shall be obtained for a period of 12 months to characterize pollutant loadings for:

(1) baseline determination

(2) each annual monitoring period, it is required that at least one sample be obtained per month for a period of 12 months.

(c) Calculations described in this subchapter shall be applied to pollutant loadings.

(d) Each loading value shall be calculated as the product of a flow measurement and pollutant concentration taken on the same date at the same discharge sampling point, using standard units of flow and concentration.

(e) If the baseline concentration in a baseline sample is below the daily maximum effluent limits established in 87.102, the baseline sample concentration may be replaced with daily maximum effluent limit for the purposes of some of the statistical calculations in this subchapter.

(f) The substituted values should be used for all methods in this subchapter except for:

(1)The calculation of the interquartile range (R) in Method 1 for the annual trigger (Step 3),

(2)In Method 2 for the single observation trigger (Step 3).

(g) The interquartile range (R) is calculated as the difference between the quartiles M_{-1} and M_1; the values for quartiles M_{-1} and M_1 should be calculated using actual loadings (based on measured concentrations) when they are used to calculate the interquartile range (R).

§87.212 Procedure for Calculating and Applying a Single-Observation (Monthly) Trigger

Two alternative methods are provided for calculating a single-observation trigger. One method must be proposed by the applicant to be approved and applied by the Department for any given remining permit.

(a) Method 1 for Calculating a Single Observation Trigger (L) is accomplished by completing the following steps:

(1) Count the number of baseline observations taken for the pollutant of interest. Label this number n. In order to sufficiently characterize pollutant loadings during baseline determination and during each annual monitoring period, it is required that at least one sample result be obtained per month for a period of 12 months.

(2) Order all baseline loading observations from lowest to highest. Let the lowest number (minimum) be $x_{(1)}$, the next lowest be $x_{(2)}$, and so forth until the highest number (maximum) is $x_{(n)}$.

(3) If fewer than 17 baseline observations were obtained, then the single observation trigger (L) will equal the maximum of the baseline observations ($x_{(n)}$).

(4) If at least 17 baseline observations were obtained, calculate the median (M) of all baseline observations: If n is odd, then M equals $x_{(n/2+1/2)}$.

(5) Next, calculate M_1 as the median of the subset of observations that range from the calculated M to the maximum $x_{(n)}$; that is, calculate the median of all x larger than or equal to M.

(6) Next, calculate M_2 as the median of the subset of observations that range from the calculated M_1 to $x_{(n)}$; that is, calculate the median of all x larger than or equal to M_1.

(7) Next, calculate M_3 as the median of the subset of observations that range from the calculated M_2 to $x_{(n)}$; that is, calculate the median of all x larger than or equal to M_2.

(8) Finally, calculate the single observation trigger (L) as the median of the subset of observations that range from the calculated M_3 to $x_{(n)}$.

(9) When subsetting the data for each of steps (a)(1) through (a)(4), the subset should include all observations greater than or equal to the median calculated in the previous step. If the median calculated in the previous step is not an actual observation, it is not included in the new subset of observations. The new median value will then be calculated using the median procedure, based on whether the number of points in the subset is odd or even.

(b) Method for applying the single observation trigger (L) to determine when the baseline level has been exceeded

(1) If two successive monthly monitoring observations both exceed L, immediately begin weekly monitoring for four weeks (four weekly samples).

(2) If three or fewer of the weekly observations exceed L, resume monthly monitoring

(3) If all four weekly observations exceed L, the baseline pollution loading has been exceeded.

(c) Method 2 for Calculating a Single Observation Trigger (L) is accomplished by completing the following steps:

(1) Follow Method 1 above to obtain M_1 (the third quartile, that is, the 75th percentile).

(2) Calculate M_{-1} as the median of the baseline data which are less than or equal to the sample median M.

(3) Calculate interquartile range, $R = (M_1 - M_{-1})$.

(4) Calculate the single observation trigger L as $L = M_1 + 3 * R$

(5) If two successive monthly monitoring observations both exceed L, immediately begin weekly monitoring for four weeks (four weekly samples).

(6) If three or fewer of the weekly observations exceed L, resume monthly monitoring

(7) If all four weekly observations exceed L, the baseline pollution loading has been exceeded.

§87.213 Procedure for Calculating and Applying an Annual Trigger

Two alternative methods are provided for calculating the annual trigger. One method must be proposed by the applicant to be approved and applied by the Department for any given remining permit.

(a) Method 1 for Calculating and Applying an Annual Trigger (T) is accomplished by completing the following steps:

(1) Calculate M and M_1 of the baseline loading data as described above under Method 1 for the single observation trigger.

(2) Calculate M_{-1} as the median of the baseline data which are less than or equal to the sample median M.

(3) Calculate the interquartile range, $R = (M_1 - M_{-1})$.

(4) The annual trigger for baseline (Tb) is calculated as:

Tb=M+(1.815*R)/SQRT(n)

where n is the number of baseline loading observations.

(5) To compare baseline loading data to observations from the annual monitoring period, repeat steps 1-3 for the set of monitoring observations. Label the results of the calculations M′ and R′. Let m be the number of monitoring observations.

(6) The subtle trigger (Tm) of the monitoring data is calculated as:

Tm=M-(1.815*R)/SQRT(n)

(7) If Tm > Tb, the median loading of the monitoring observations has exceeded the baseline loading.

(b) Method 2 for Calculating and Applying an Annual Trigger (T) is accomplished by completing the following steps:

(1) Let n be the number of baseline loading observations taken, and let m be the number of monitoring loading observations taken. In order to sufficiently characterize pollutant loadings during baseline determination and during each annual monitoring period, it is required that at least one sample result be obtained per month for a period of 12 months.

(2) Order the combined baseline and monitoring observations from smallest to largest.

(3) Assign a rank to each observation based on the assigned order: the smallest observation will have rank 1, the next smallest will have rank 2, and so forth, up to the highest observation, which will have rank n + m. If two or more observations are tied (have the same value), then the average rank for those observations should be used.

(4) Sum all the assigned ranks of the n baseline observations, and let this sum be S_n.

(5) Obtain the critical value (C) from Table 1.

(6) Compare C to S_n. If S_n is less than C, then the monitoring loadings have exceeded the baseline loadings.

Critical Values for the Wilcoxon-Mann-Whitney Test

(a) When n and m are less than 21, use Table 1. In order to find the appropriate critical value, match column with correct n (number of baseline observations) to row with correct m (number of monitoring observations).

Table 1—Critical Values (C) of the Wilcoxon-Mann-Whitney Test (for a one-sided test at the 0.001 significance level)

nm	10	11	12	13	14	15	16	17	18	19	20
10	66	79	93	109	125	142	160	179	199	220	243
11	68	82	96	112	128	145	164	183	204	225	248
12	70	84	99	115	131	149	168	188	209	231	253
13	73	87	102	118	135	153	172	192	214	236	259
14	75	89	104	121	138	157	176	197	218	241	265
15	77	91	107	124	142	161	180	201	223	246	270
16	79	94	110	127	145	164	185	206	228	251	276

17	**81**	**96**	**113**	**130**	**149**	**168**	**189**	**211**	**233**	**257**	**281**
18	**83**	**99**	**116**	**134**	**152**	**172**	**193**	**215**	**238**	**262**	**287**
19	**85**	**101**	**119**	**137**	**156**	**176**	**197**	**220**	**243**	**268**	**293**
20	**88**	**104**	**121**	**140**	**160**	**180**	**202**	**224**	**248**	**273**	**299**

(b) When n or m is greater than 20 and there are few ties, calculate an approximate critical value using the following formula and round the result to the next larger integer. Let N = n + m.

$$\text{Critical Value}=0.5*n(N+1)-3.0902*\text{SQRT}(n*M(N+1)/12)$$

(c) When n or m is greater than 20 and there are many ties, calculate an approximate critical value using the following formula and round the result to the next larger integer. Let S be the sum of the squares of the ranks or average ranks of all N observations. Let N = n + m.

$$\text{Critical Value}=0.5*n(N+1)-3.0902*\text{SQRT}(V)$$

In the preceding formula, calculate V using:

$$V=(n*m*S)/(N*(N-1)-(n*m*(N+1)^2/(4*(N-1))$$

* * * * *

CHAPTER 88. ANTHRACITE COAL

Subchapter G. ANTHRACITE SURFACE MINING ACTIVITIES AND ANTHRACITE BANK REMOVAL AND RECLAMATION ACTIVITIES: MINIMUM REQUIREMENTS FOR REMINING AREAS WITH POLLUTIONAL DISCHARGES

* * * * *

§ 88.502. Definitions.

The following words and terms, when used in this subchapter, have the following meanings, unless the context clearly indicates otherwise:

[*Abatement plan*—An individual technique or combination of techniques, the

implementation of which will result in reduction of baseline pollution load. Abatement techniques may include, but are not limited to: Addition of alkaline material, special plans for managing toxic and acid forming material, regrading, revegetation and daylighting.]

* * * * *

Best technology—Measures and practices which will abate or ameliorate to the maximum extent possible pollutional discharges from or on the pollution abatement area. These measures include engineering, geochemical or applicable practices.

Coal remining operation **-- a coal mining operation at a site on which coal mining was previously conducted and where the site has been abandoned or the performance bond has been forfeited.**

Encountered Discharge **-- A preexisting discharge intercepted in the course of active surface mining activities, including but not limited to overburden removal, coal extraction and backfilling, or that occurs in the pit, any mining-related conveyance, sedimentation pond or treatment pond. Encountered discharges do not include diversions of surface water and shallow groundwater flow from areas undisturbed by the implementation of the pollution abatement plan which would otherwise drain into the affected area so long as they are designed, operated and maintained in accordance with §§ 88.95(b)-(g), 88.190(b)-(g) or 88.295(b)-(g) as applicable.**

Pollution abatement area—The part of the permit area which is causing or contributing to the baseline pollution load, which shall include adjacent and nearby areas that must be affected to bring about significant improvement of the baseline pollution load, and which may include the immediate location of the discharges.

Pollution abatement plan**—Best management practices (BMPs), that include but are not limited to: addition of alkaline material, special handling plans for managing toxic and acid forming material, regrading, revegetation and daylighting, that when implemented will result in reduction of the baseline pollution load.**

Pre-existing discharge **-- any discharge resulting from mining activities that have been abandoned prior to the time of a remining permit application. This term shall include a pre-existing discharge that is relocated as a result of the implementation of best management practices (BMPs) contained in the pollution abatement plan.**

Steep slope **-- any slope, including abandoned mine land features, above twenty degrees or such lesser slope as may be defined by the Department after consideration of soil, climate, and other characteristics of a region. This term does not apply to those situations in which an operator is mining on flat or gently rolling terrain, on which an occasional steep slope is encountered and through which the mining operation is to proceed, leaving a plain or predominantly flat area.**

§ 88.503. Applicability.

(a) This subchapter is applicable only to surface mining activities and bank removal and reclamation activities as defined in § 88.1 (relating to definitions) **and coal refuse disposal activities subject to subchapter D, relating to Anthracite refuse disposal: minimum environmental protection performance standards**.

* * * * *

(d) This subchapter applies to pre-existing discharges that are located within or are hydrologically connected to pollution abatement areas of a coal remining operation.

(e) Where coal remining operations seek reissuance of an existing remining permit with best professional judgment limitations and the Department determines that it is not feasible for a remining operator to re-establish baseline pollutant levels in accordance with the statistical procedures contained in this subchapter, pre-existing discharge limitations at existing remining operations shall remain subject to baseline pollutant levels established during the original permit application.

§ 88.504. Application for authorization.

(a) An operator who requests authorization under this subchapter shall comply with the permit application requirements of Chapter 86 (relating to surface and underground coal mining: general) and Chapter 87, Subchapter B (Reserved), and Subchapter A and either Subchapters B or C—whichever is applicable—of this chapter except as specifically modified by this subchapter. The operator shall also comply with all of the following:

(1) Delineate on a map the proposed pollution abatement area, including the location of the preexisting discharges.

(2) Provide a description of the hydrologic balance for the proposed pollution abatement area that includes:

(i) Results of a detailed water quality and quantity monitoring program, including seasonal variations, variations in response to precipitation events, and modeled baseline pollution loads using this monitoring program.

(ii) Monitoring for **flow,** pH, alkalinity, acidity, total iron, total manganese, **total** aluminum, sulfates, total suspended solids and other water quality parameters the Department deems relevant.

(3) Provide a **[description of the] pollution** abatement plan **[that includes]which shall**:

(i) Decribe the pollution abatement area

(ii) Be designed to reduce the pollution load from pre-existing discharges and must identify the selected best management practices (BMPs) to be used.

(iii) Describe the design specifcations, construction specifications, maintenance schedules, criteria for monitoring and inspection, and expected performance of the BMPs.

(iv) Represent the best technology and include:

(**[i]A**) Plans, cross sections and schematic drawings describing the abatement plan proposed to be implemented.

(**[ii]B**) A description and explanation of the range of abatement that probably can be achieved, costs and each step in the proposed abatement plan.

(**[iii]C**) A description of the standard of success for revegetation necessary to insure success of the abatement plan.

(v) Provide a description of and information on the pre-existing discahrges hydrologically connected to the remining area.

(4) Determine the baseline pollution load.

(5) Provide the background data that are the bases for the baseline pollution load. The baseline pollution load shall be reported in lbs/day.

(b) The operator seeking this authorization **[shall]may** continue the water quality and quantity monitoring program required by subsection (a)(2) after making the authorization request. The operator **[shall]may** submit the results of this continuing monitoring program to the Department on a monthly basis until a decision on the authorization request is made.

* * * * *

§ 88.506. Operational requirements.

An operator who receives an authorization under this subchapter shall comply with the requirements of Chapter 86 (relating to surface and underground coal mining: general), and Chapter 87, Subchapter B (Reserved), and Subchapter A and either Subchapters B or C—whichever is applicable—except as specifically modified by this subchapter. The operator shall also:

(1) Implement the approved water quality and quantity monitoring program for the pollution abatement area until the requirements of § 88.509 (relating to criteria and schedule for release of bonds on pollution abatement areas) are met. **The monitoring program shall conform to the following:**

(i) Sampling shall be conducted on a monthly basis for the preexisting discharges and should adequately represent the seasonal range in loading rates as well as the median loading rate from each pre-existing discharge or combination of discharges.

(ii) Results shall be submitted on a quarterly basis

(iii) Data shall include the flow measurements and loading calculations.

(2) Implement the approved **pollution** abatement plan.

(3) **[Notify the Department immediately prior to the completion of each step of the abatement plan.**

(4) Provide progress reports to the Department within 30 days after the completion of each step of the abatement program that include a notarized statement signed by the operator, and if required by the Department, a statement signed by the supervising engineer, that all work has been performed in accordance with the terms and conditions of the pollution abatement authorization, the approved maps, plans, profiles and specifications.]

Notify the Department when more frequent sampling is required.

(a) Weekly sampling of the preexisting discharges shall begin if any two consecutive monthly samples of pollution load at any of the monitoring points or hydrologic units exceed one or more of the triggers established by the baseline data.

(b) Weekly sampling requirements shall continue until two consecutive weekly sample analyses indicate that all parameters which triggered weekly sampling have dropped below the trigger established by the baseline data.

§ 88.507. Treatment of discharges.

(a) Except for preexisting discharges which are not encountered during mining or the implementation of the abatement plan, the operator shall comply with § § 88.92**, [and]** 88.187 **and 88.292** (relating to hydrologic balance: effluent standards; **hydrologic balance: effluent standards**; and hydrologic balance: effluent standards).

(b) **Except as provided under § 88.210(d), relating to discharges for which baseline pollution load cannot be established), the [The]** operator shall treat the preexisting discharges which are not encountered during mining or implementation of the abatement plan to comply with the effluent limitations established by best professional judgment. The effluent limitations established by best professional judgment may not be less than baseline pollution load. If the baseline pollution load when expressed as a concentration for a specific parameter satisfies the effluent limitations at § § 88.92**, [and]** 88.187 **and 88.292** for that parameter, the operator shall

treat the preexisting discharge for that parameter to comply with effluent limitations established by best professional judgment or the effluent limitations at § § 88.92**, [and]** 88.187 **and 88.292**.

(c) For purposes of subsections (a) and (b), the term ‘‘encountered’’ may not be construed to mean diversions of surface water and shallow groundwater flow from areas undisturbed by the implementation of the abatement plan which would otherwise drain into the affected area, so long as the diversions are designed, operated and maintained under § § 88.95(b)**, [and]** 88.190(b) (relating to hydrologic balance: diversions) **and 88.295(b) (relating to hydrologic balance: diversions an conveyances)**.

* * * * *

(g) If four (4) consecutive weekly determinations of pollution load, as required under § 88.506(3)(a), exceed one or more triggers, the permittee shall notify the Department and commence treatment within thirty (30) days of the fourth sample in accordance with the treatment limits established in the permit.

(h) If the Department determines, through analysis of any data submitted pursuant to the monitoring requirements or any data collected by the Department that there has been pollution loading degradation at any of the monitoring points or hydrologic units, the Department will notify the permittee accordingly. The permittee shall then commence treatment within thirty (30) days, in accordance with the treatment limits established in the permit.

(i) Any pre-existing pollutional discharge which is an encountered discharge shall be treated to the effluent limitations set forth in the permit until such time as the discharge is no longer encountered.

(j) For the purposes of determining applicable effluent limitations, a discharge shall continue to be deemed to be an encountered discharge until such time as the surface mining area which has been disturbed and which contributes to the discharge has been backfilled and regraded, and revegetation work has commenced.

* * * * *

§ 88.509. Criteria and schedule for release of bonds on pollution abatement areas.

* * * * *

(b) The Department will release an additional amount of bond for the authorized pollution abatement area but retaining an amount sufficient to cover the cost to the Department of reestablishing vegetation if completed by a third party if the operator demonstrates and the Department finds that:

(1) The operator has replaced the topsoil or material conserved under § § 88.87**, [and]** 88.183 (relating to vegetation-supporting material: available soil removal; and vegetation-supporting material: soil), **and 88.287 (relating to vegetative-supportive material: available soil removal),** completed final grading, planting and established revegetation in accordance with the approved reclamation plan and achieved the standard of success for revegetation in § 88.505(a)(5) (relating to approval or denial).

* * * * *

(c) The Department will release the remaining portion of the amount of bond on the authorized pollution abatement area if the applicant demonstrates and the Department finds that:

(1) The operator has successfully completed all the approved abatement and reclamation plans and the pollution abatement area is capable of supporting the postmining land use approved under § § **88.133,** 88.221 and 88.334 (relating to postmining land use; **postmining land use;** and postdisposal land use).

* * * * *

§ 88.510 Effluent limitations

(a) The pollution abatement plan for the pollution abatement area must be approved by the Department and incorporated into the permit as an effluent limitation.

(b)The best management practices (BMPs) in the pollution abatement plan must be implemented as specified in the plan.

(c) (1) Except as provided in subsection (d) of this section, the following effluent limits apply to pre-existing discharges:

Parameter	Effluent Limit
Total Iron	May not exceed baseline loadings (as determined by this subchapter)
Total Manganese	May not exceed baseline loadings (as determined by this subchapter)
Acidity, Net	May not exceed baseline loadings (as determined by this subchapter)
Suspended Solids	During remining and reclamation, may not exceed baseline loadings (as determineded by this subchapter). Prior to bond release, the pre-existing discharge must meet the applicable standards for Suspended Solids or Settleable Solids at § 88.92, §88.187 or §88.292.

(c)(2) A pre-existing discharge is exempt from meeting standards in § 88.92, §88.187 or §88.292 for Suspended Solids and Settleable Solids when the Department determines

that the standards are infeasible or impractical based on the site-specific conditions of soil, climate, topography, steep slopes, or other baseline conditions provided that the operator demonstrates that significant reductions of Suspended Solids and Settleable Solids will be achieved through the incorporation of sediment control BMPs into the pollution abatement plan as required by subsection (a) of this section.

(d) (1)If the Department determines that it is infeasible to collect samples for establishing the baseline pollutant levels pursuant this subsection, and that remining will result in significant improvement that would not otherwise occur, then the permit applicant may establish an in-stream baseline concentration at a suitable point downstream from the remining operation and the numeric effluent limitations in subsection (c)(1) of this section do not apply.

(2) The in-stream baseline period shall include, at a minimum, twice monthly monitoring for a minimum of a one-year period and shall adequately represent the seasonal range and median pollutant concentrations.

(3) Upon issuance of a surface mining permit, the operator will continue, at a minimum, monthly monitoring of pollutant concentrations at the in-stream monitoring point referenced in subsection (d)(1), and make a determination as to whether or not there has been degradation of in-stream water quality.

(i) This determination shall be made on a quarterly basis and for each year defined as each consecutive 12-month period.

(ii) The operator is not required to treat individual preexisting sources of pollution except as may be needed to maintain the in-stream baseline concentration.

(iii) Unless the operator can demonstrate to the satisfaction of the Department that the degradation was the result of factors that are not related to the remining , the operator shall treat one or more preexisting pollutional discharges or undertake other pollution abatement measures to restore or improve the in-stream pollutant concentration to its baseline conditions .

(4) Pre-existing discharges for which it is infeasible to collect samples for determination of baseline pollutant levels include, but are not limited to:

(i) Discharges that exist as a diffuse groundwater flow that cannot be assessed via collection of samples.

(ii) A base flow to a receiving stream that cannot be monitored separate from the receiving stream.

(iii) A discharge on a steep or hazardous slope that is inaccessible for sample collection.

(iv) A number of pre-existing discharges so extensive that monitoring of individual discharges is infeasible.

(5) Where in-stream monitoring are not indicative of the impact of remining, the in-stream monitoring requirement may be waived by the Department. In-stream monitoring

is not indicative of the impact of remining in circumstances, including but not limited to the following:

(i) Remining sites in drainage areas exceeding 10 square miles.

(ii)Remining sites in watersheds where there are other influences on the in-stream water quality that make it impossible to establish the cause of water quality changes.

(iii)Remining sites where the $Q_{7\text{-}10}$ stream flow is zero.

(e) Pollutants for which there are not effluent limitations established in § 88.92 , §88.187 or §88.292 may be eligible for limits established under this subchapter.

(f) The provisions of § 88.92 (relating to Hydrologic balance: effluent standards), § 88.187 (relating to Hydrologic balance: effluent standards), or§ 88.292 (relating to Hydrologic balance: effluent standards) apply to:

(1) A pre-existing discharge that is intercepted by surface mining activities.

(2) A pre-existing discharge that is commingled with waste streams from operational areas for the purposes of water treatment.

(g) The provisions of § 88.92 (relating to Hydrologic balance: effluent standards), § 88.187 (relating to Hydrologic balance: effluent standards) or § 88.292 (relating to Hydrologic balance: effluent standards) cease to apply to a pre-existing discharge described in subsection (f) when the pre-existing discharge is no longer intercepted by surface mining activities or is no longer commingled with waste streams from operational areas for the purposes of water treatment.

(h) The effluent limitations in this subchapter apply to pre-existing discharges until bond release under the procedures in Chapter 86.

§ 88.511 Baseline Determination and Compliance Monitoring for Pre-existing Discharges at Remining Operations.

(a) The procedures described in this section shall be used for determining site-specific, baseline pollutant loadings, and for determining whether discharge loadings during coal remining operations have exceeded the baseline loading. Both a monthly (single-observation) procedure and an annual procedure shall be applied.

(b) At least one sample result per month shall be obtained for a period of 12 months to characterize pollutant loadings for:

(1) baseline determination

(2) each annual monitoring period, it is required that at least one sample be obtained per month for a period of 12 months.

(c) Calculations described in this subchapter shall be applied to pollutant loadings.

(d) Each loading value shall be calculated as the product of a flow measurement and pollutant concentration taken on the same date at the same discharge sampling point, using standard units of flow and concentration.

(e) If the baseline concentration in a baseline sample is below the daily maximum effluent limits established in §88.92, §88.187 or §88.292, the baseline sample concentration

may be replaced with daily maximum effluent limit for the purposes of some of the statistical calculations in this subchapter.

(f) The substituted values should be used for all methods in this subchapter except for

(1)The calculation of the interquartile range (R) in Method 1 for the annual trigger (Step 3),

(2)In Method 2 for the single observation trigger (Step 3).

(g) The interquartile range (R) is calculated as the difference between the quartiles M_{-1} and M_1; the values for quartiles M_{-1} and M_1 should be calculated using actual loadings (based on measured concentrations) when they are used to calculate the interquartile range (R).

§88.512 Procedure for Calculating and Applying a Single-Observation (Monthly) Trigger

Two alternative methods are provided for calculating a single-observation trigger. One method must be proposed by the applicant to be approved and applied by the Department for any given remining permit.

(a) Method 1 for Calculating a Single Observation Trigger (L) is accomplished by completing the following steps:

(1) Count the number of baseline observations taken for the pollutant of interest. Label this number n. In order to sufficiently characterize pollutant loadings during baseline determination and during each annual monitoring period, it is required that at least one sample result be obtained per month for a period of 12 months.

(2) Order all baseline loading observations from lowest to highest. Let the lowest number (minimum) be $x_{(1)}$, the next lowest be $x_{(2)}$, and so forth until the highest number (maximum) is $x_{(n)}$.

(3) If fewer than 17 baseline observations were obtained, then the single observation trigger (L) will equal the maximum of the baseline observations ($x_{(n)}$).

(4) If at least 17 baseline observations were obtained, calculate the median (M) of all baseline observations: If n is odd, then M equals $x_{(n/2+1/2)}$.

(5) Next, calculate M_1 as the median of the subset of observations that range from the calculated M to the maximum $x_{(n)}$; that is, calculate the median of all x larger than or equal to M.

(6) Next, calculate M_2 as the median of the subset of observations that range from the calculated M_1 to $x_{(n)}$; that is, calculate the median of all x larger than or equal to M_1.

(7) Next, calculate M_3 as the median of the subset of observations that range from the calculated M_2 to $x_{(n)}$; that is, calculate the median of all x larger than or equal to M_2.

(8) Finally, calculate the single observation trigger (L) as the median of the subset of observations that range from the calculated M_3 to $x_{(n)}$.

(9) When subsetting the data for each of steps (a) (1) through (a) (4), the subset should include all observations greater than or equal to the median calculated in the previous step. If the median calculated in the previous step is not an actual observation, it is not included in the new subset of observations. The new median value will then be calculated using the median procedure, based on whether the number of points in the subset is odd or even.

(b) Method for applying the single observation trigger (L) to determine when the baseline level has been exceeded

(1) If two successive monthly monitoring observations both exceed L, immediately begin weekly monitoring for four weeks (four weekly samples).

(2) If three or fewer of the weekly observations exceed L, resume monthly monitoring

(3) If all four weekly observations exceed L, the baseline pollution loading has been exceeded.

(c) Method 2 for Calculating a Single Observation Trigger (L) is accomplished by completing the following steps:

(1) Follow Method 1 above to obtain M_1 (the third quartile, that is, the 75th percentile).

(2) Calculate M_{-1} as the median of the baseline data which are less than or equal to the sample median M.

(3) Calculate interquartile range, $R = (M_1 - M_{-1})$.

(4) Calculate the single observation trigger L as $L = M_1 + 3 * R$

(5) If two successive monthly monitoring observations both exceed L, immediately begin weekly monitoring for four weeks (four weekly samples).

(6) If three or fewer of the weekly observations exceed L, resume monthly monitoring

(7) If all four weekly observations exceed L, the baseline pollution loading has been exceeded.

§88.513 Procedure for Calculating and Applying an Annual Trigger

Two alternative methods are provided for calculating the annual trigger. One method must be proposed by the applicant to be approved and applied by the Department for any given remining permit.

(a) Method 1 for Calculating and Applying an Annual Trigger (T) is accomplished by completing the following steps:

(1) Calculate M and M_1 of the baseline loading data as described above under Method 1 for the single observation trigger.

(2) Calculate M_{-1} as the median of the baseline data which are less than or equal to the sample median M.

(3) Calculate the interquartile range, $R = (M_1 - M_{-1})$.

(4) The annual trigger for baseline (Tb) is calculated as:

Tb=M+(1.815*R)/SQRT(n)

where n is the number of baseline loading observations.

(5) To compare baseline loading data to observations from the annual monitoring period, repeat steps 1-3 for the set of monitoring observations. Label the results of the calculations M′ and R′. Let m be the number of monitoring observations.

(6) The subtle trigger (Tm) of the monitoring data is calculated as:

Tm=M-(1.815*R)/SQRT(n)

(7) If Tm > Tb, the median loading of the monitoring observations has exceeded the baseline loading.

(b) Method 2 for Calculating and Applying an Annual Trigger (T) is accomplished by completing the following steps:

(1) Let n be the number of baseline loading observations taken, and let m be the number of monitoring loading observations taken. In order to sufficiently characterize pollutant loadings during baseline determination and during each annual monitoring period, it is required that at least one sample result be obtained per month for a period of 12 months.

(2) Order the combined baseline and monitoring observations from smallest to largest.

(3) Assign a rank to each observation based on the assigned order: the smallest observation will have rank 1, the next smallest will have rank 2, and so forth, up to the highest observation, which will have rank n + m. If two or more observations are tied (have the same value), then the average rank for those observations should be used.

(4) Sum all the assigned ranks of the n baseline observations, and let this sum be S_n.

(5) Obtain the critical value (C) from Table 1.

(6) Compare C to S_n. If S_n is less than C, then the monitoring loadings have exceeded the baseline loadings.

Critical Values for the Wilcoxon-Mann-Whitney Test

(a) When n and m are less than 21, use Table 1. In order to find the appropriate critical value, match column with correct n (number of baseline observations) to row with correct m (number of monitoring observations).

Table 1—Critical Values (C) of the Wilcoxon-Mann-Whitney Test (for a one-sided test at the 0.001 significance level)

nm	10	11	12	13	14	15	16	17	18	19	20
10	66	79	93	109	125	142	160	179	199	220	243
11	68	82	96	112	128	145	164	183	204	225	248
12	70	84	99	115	131	149	168	188	209	231	253
13	73	87	102	118	135	153	172	192	214	236	259
14	75	89	104	121	138	157	176	197	218	241	265
15	77	91	107	124	142	161	180	201	223	246	270
16	79	94	110	127	145	164	185	206	228	251	276
17	81	96	113	130	149	168	189	211	233	257	281
18	83	99	116	134	152	172	193	215	238	262	287
19	85	101	119	137	156	176	197	220	243	268	293
20	88	104	121	140	160	180	202	224	248	273	299

(b) When n or m is greater than 20 and there are few ties, calculate an approximate critical value using the following formula and round the result to the next larger integer. Let N = n + m.

$$\text{Critical Value}=0.5*n(N+1)-3.0902*\sqrt{n*M(N+1)/12}$$

(c) When n or m is greater than 20 and there are many ties, calculate an approximate critical value using the following formula and round the result to the next larger integer. Let S be the sum of the squares of the ranks or average ranks of all N observations. Let N = n + m.

$$\text{Critical Value}=0.5*n(N+1)-3.0902*\sqrt{V}$$

In the preceding formula, calculate V using:

$$V=(n*m*S)/(N*(N-1)-(n*m*(N+1)^2/(4*(N-1))$$

CHAPTER 90. COAL REFUSE DISPOSAL

Subchapter F. COAL REFUSE DISPOSAL ACTIVITIES ON AREAS WITH PREEXISTING POLLUTIONAL DISCHARGES

* * * * *

§ 90.302. Definitions.

The following words and terms, when used in this subchapter, have the following meanings, unless the context clearly indicates otherwise:

[*Abatement plan*—Any individual technique or combination of techniques, the implementation of which will result in reduction of the base line pollution load. Abatement techniques include, but are not limited to: Addition of alkaline material, special plans for managing toxic and acid-forming material, regrading, revegetation and relocating coal refuse to a coal refuse disposal area that includes systems to prevent adverse impacts to surface and groundwater and to prevent precipitation from contacting the coal refuse.]

* * * * *

Coal refuse disposal activities—The storage, dumping or disposal of any waste coal, rock, shale, slurry, culm, gob, boney, slate, clay, underground development wastes, coal processing wastes, excess soil and related materials, associated with or near a coal seam, that are either brought above ground or otherwise removed from a coal mine in the process of mining coal or are separated from coal during the cleaning or preparation operations. The term does not include the removal or storage of overburden from surface mining activities.

Coal remining operation **-- a coal mining operation at a site on which coal mining was previously conducted and where the site has been abandoned or the performance bond has been forfeited.**

Encountered Discharge **-- A preexisting discharge intercepted in the course of active surface mining activities, including but not limited to overburden removal, coal extraction and backfilling, or that occurs in the pit, any mining-related conveyance, sedimentation pond or treatment pond. Encountered discharges do not include diversions of surface water and shallow groundwater flow from areas undisturbed by the implementation of the pollution abatement plan which would otherwise drain into the affected area so long as they are designed, operated and maintained in accordance with § 90.104(b)-(g).**

Excess soil and related material—Rock, clay or other material located immediately above or below a coal seam and which are extracted from a coal mine during the process of mining coal. The term does not include topsoil or subsoil.

Pollution abatement area—The part of the permit area that is causing or contributing to the baseline pollution load. The term includes adjacent and nearby areas that must be affected to bring about significant improvements of the baseline pollution load and may include the immediate locations of the discharges.

Pollution abatement plan**—Best management practices (BMPs), the implementation of which will result in reduction of the baseline pollution load. BMPs include but are not limited to: addition of alkaline material, special handling plans for managing toxic and acid forming material, regrading, revegetation and daylighting.**

Pre-existing discharge **-- any discharge resulting from mining activities that have been abandoned prior to the time of a remining permit application. This term shall include a pre-existing discharge that is relocated as a result of the implementation of best management practices (BMPs) contained in the pollution abatement plan.**

Steep slope **-- any slope, including abandoned mine land features, above twenty degrees or such lesser slope as may be defined by the Department after consideration of soil, climate, and other characteristics of a region. This term does not apply to those situations in which an operator is mining on flat or gently rolling terrain, on which an occasional steep slope is encountered and through which the mining operation is to proceed, leaving a plain or predominantly flat area.**

§ 90.303. Applicability.

* * * * *

(c) This subchapter applies to pre-existing discharges that are located within or are hydrologically connected to pollution abatement areas of a coal remining operation.

(d) Where coal remining operations seek reissuance of an existing remining permit with best professional judgment limitations and the Department determines that it is not feasible for a remining operator to re-establish baseline pollutant levels in accordance with the statistical procedures contained in this subchapter, pre-existing discharge limitations at existing remining operations shall remain subject to baseline pollutant levels established during the original permit application.

§ 90.304. Application for authorization.

(a) An operator who requests authorization under this subchapter shall comply with the permit application requirements of Chapter 86 (relating to surface and underground coal mining: general) and Subchapters A—D, except as specifically modified by this subchapter. The operator shall also:

(1) Delineate on a map the proposed pollution abatement area, including the location of the preexisting discharges.

(2) Provide a description of the hydrologic balance for the proposed pollution abatement area that includes:

(i) Results of a detailed water quality and quantity monitoring program, including seasonal variations, variations in response to precipitation events and modeled baseline pollution loads using this monitoring program.

(ii) Monitoring for **flow,** pH, alkalinity, acidity, total iron, total manganese, **total** aluminum, sulfates, total suspended solids and other water quality parameters the Department deems relevant.

(3) Provide a **[description of the] pollution** abatement plan **[that represents best technology and includes the following] which shall**:

(i) Describe the pollution abatement area

(ii) Be designed to reduce the pollution load from pre-existing discharges and must identify the selected best management practices (BMPs) to be used

(iii) Describe the design specifications, construction specifications, maintenance schedules, criteria for monitoring and inspection, and expected performance of the BMPs

(iv) Represent best technology and include:

(**[i]A**) Plans, cross-sections and schematic drawings describing the abatement plan proposed to be implemented.

(**[ii]B**) A description and explanation of the range of abatement level that is anticipated to be achieved, costs and each step in the proposed abatement plan.

(**[iii]C**) A description of the standard of success for revegetation necessary to ensure success of the abatement plan.

(v) Provide a description of an information on the pre-existing discharges hydrogeologically connected to the remining area.

(4) Determine the baseline pollution load.

(5) Provide background data that are the bases for the baseline pollution load. The baseline pollution load shall be reported in lbs/day.

(b) The operator seeking this authorization **[shall] may** continue the water quality and quantity monitoring program required by subsection (a)(2) after making the authorization request. The operator **[shall] may** submit the results of this continuing monitoring program to the Department on a monthly basis until a decision on the authorization request is made.

* * * * *

§ 90.306. Operational requirements.

(a) An operator who receives an authorization under this subchapter shall comply with Chapter 86 (relating to surface and underground coal mining: general) and Subchapters A—D except as specifically modified by this subchapter. The operator shall also:

(1) Implement the approved water quality and quantity monitoring program for the pollution abatement area until the requirements of § 90.309 (relating to criteria and schedule for release of bonds on pollution abatement areas) are met. **The monitoring program shall conform to the following:**

(i) Sampling shall be conducted on a monthly basis for the preexisting discharges and should adequately represent the seasonal range in loading rates as well as the median loading rate from each pre-existing discharge or combination of discharges.

(ii) Results shall be submitted on a quarterly basis

(iii) Data shall include the flow measurements and loading calculations.

(2) Implement the approved **pollution** abatement plan.

(3) **[Notify the Department immediately prior to the completion of each step of the abatement plan.**

(4) Provide a progress report to the Department within 30 days after the completion of each step of the abatement program that includes a statement signed by the operator, and if required by the Department, a statement signed by the supervising engineer, that all

work has been performed in accordance with the terms and conditions of the pollution abatement authorization, the approved maps, plans, profiles and specifications.]

Notify the Department when more frequent sampling is required.

(a) Weekly sampling of the preexisting discharges shall begin if any two consecutive monthly samples of pollution load at any of the monitoring points or hydrologic units exceed one or more of the triggers established by the baseline data.

(b) Weekly sampling requirements shall continue until two consecutive weekly sample analyses indicate that all parameters which triggered weekly sampling have dropped below the trigger established by the baseline data.

§ 90.307. Treatment of discharges.

(a) Except for preexisting discharges that are not encountered during coal refuse disposal activities or the implementation of the abatement plan, the operator shall comply with § 90.102 (relating to hydrologic balance: water quality standards, effluent limitations and best management practices).

(b) **Except as provided under 90.310(d), relating to discharges for which a baseline pollution load cannont be established, the[The]** operator shall treat the preexisting discharges that are not encountered during coal refuse disposal activities or implementation of the abatement plan to comply with the effluent limitations established by best professional judgment. The effluent limitations established by best professional judgment may not be less than the baseline pollution load. If the baseline pollution load, when expressed as a concentration for a specific parameter, satisfies the effluent limitation in § 90.102 for that parameter, the operator shall treat the preexisting discharge for that parameter to comply with either effluent limitations established by best professional judgment or the effluent limitations in § 90.102.

* * * * *

(g) If four (4) consecutive weekly determinations of pollution load, as required under § 86.306(3)(a), exceed one or more triggers, the permittee shall notify the Department and commence treatment within thirty (30) days of the fourth sample in accordance with the treatment limits established in the permit.

(h) If the Department determines, through analysis of any data submitted pursuant to the monitoring requirements or any data collected by the Department that there has been pollution loading degradation at any of the monitoring points or hydrologic units, the Department will notify the permittee accordingly. The permittee shall then commence treatment within thirty (30) days, in accordance with the treatment limits established in the permit.

(i) Any pre-existing pollutional discharge which is an encountered discharge shall be treated to the effluent limitations set forth in the permit until such time as the discharge is no longer encountered.

(j) For the purposes of determining applicable effluent limitations, a discharge shall continue to be deemed to be an encountered discharge until such time as the surface mining area which has been disturbed and which contributes to the discharge has been backfilled and regraded, and revegetation work has commenced.

* * * * *

§ 90.310 Effluent limitations

(a) The pollution abatement plan for the pollution abatement area must be approved by the Department and incorporated into the permit as an effluent limitation.

(b)The best management practices (BMPs) in the pollution abatement plan must be implemented as specified in the plan.

(c) (1) Except as provided in subsection (d) of this section, the following effluent limits apply to pre-existing discharges:

Parameter	Effluent Limit
Total Iron	May not exceed baseline loadings (as determined by this subchapter)
Total Manganese	May not exceed baseline loadings (as determined by this subchapter)
Acidity, Net	May not exceed baseline loadings (as determined by this subchapter)
Suspended Solids	During remining and reclamation, may not exceed baseline loadings (as determined by this subchapter). Prior to bond release, the pre-existing discharge must meet the applicable standards for Suspended Solids or Settleable Solids at § 90.102.

(2) A pre-existing discharge is exempt from meeting standards in § 90.102 for Suspended Solids and Settleable Solids when the Department determines that the standards are infeasible or impractical based on the site-specific conditions of soil, climate, topography, steep slopes, or other baseline conditions provided that the operator demonstrates that significant reductions of Suspended Solids and Settleable Solids will be achieved through the incorporation of sediment control BMPs into the pollution abatement plan as required by subsection (a) of this section.

(d) (1)If the Department determines that it is infeasible to collect samples for establishing the baseline pollutant levels pursuant to this subsection, and that remining will result in significant improvement that would not otherwise occur, then the permit applicant may

establish an in-stream baseline concentration at a suitable point downstream from the remining operation and the numeric effluent limitations in subsection (c)(1) of this section do not apply.

(2) The in-stream baseline period shall include, at a minimum, twice monthly monitoring for a minimum of a one-year period and shall adequately represent the seasonal range and median pollutant concentrations.

(3) Upon issuance of a surface mining permit, the operator will continue, at a minimum, monthly monitoring of pollutant concentrations at the in-stream monitoring point referenced in subsection (d)(1), and make a determination as to whether or not there has been degradation of in-stream water quality.

(i) This determination shall be made on a quarterly basis and for each year defined as each consecutive 12-month period.

(ii) The operator is not required to treat individual preexisting sources of pollution except as may be needed to maintain the in-stream baseline concentration.

(iii) Unless the operator can demonstrate to the satisfaction of the Department that the degradation was the result of factors that are not related to the remining , the operator shall treat one or more preexisting pollutional discharges or undertake other pollution abatement measures to restore or improve the in-stream pollutant concentration to its baseline conditions .

(4) Pre-existing discharges for which it is infeasible to collect samples for determination of baseline pollutant levels include, but are not limited to:

(i) Discharges that exist as a diffuse groundwater flow that cannot be assessed via collection of samples.

(ii) A base flow to a receiving stream that cannot be monitored separate from the receiving stream.

(iii) A discharge on a steep or hazardous slope that is inaccessible for sample collection.

(iv) A number of pre-existing discharges so extensive that monitoring of individual discharges is infeasible.

(5) Where in-stream monitoring are not indicative of the impact of remining, the in-stream monitoring requirement may be waived by the Department. In-stream monitoring is not indicative of the impact of remining in circumstances including, but not limited to the following:

(i) Remining sites in drainage areas exceeding 10 square miles.

(ii)Remining sites in watersheds where there are other influences on the in-stream water quality that make it impossible to establish the cause of water quality changes.

(iii)Remining sites where the $Q_{7\text{-}10}$ stream flow is zero.

(e) Pollutants for which there are not effluent limitations established in § 90.102 may be eligible for limits established under this subchapter.

(f) The provisions of § 90.102 (relating to Hydrologic balance: effluent standards) apply to:

(1) A pre-existing discharge that is intercepted by surface mining activities.

(2) A pre-existing discharge that is commingled with waste streams from operational areas for the purposes of water treatment.

(g) The provisions of § 90.102 (relating to Hydrologic balance: effluent standards) cease to apply to a pre-existing discharge described in subsection (f) when the pre-existing discharge is no longer intercepted by surface mining activities or is no longer commingled with waste streams from operational areas for the purposes of water treatment.

(h) The effluent limitations in this subchapter apply to pre-existing discharges until bond release under the procedures in Chapter 86.

§ 90.311 Baseline Determination and Compliance Monitoring for Pre-existing Discharges at Remining Operations.

(a) The procedures described in this section shall be used for determining site-specific, baseline pollutant loadings, and for determining whether discharge loadings during coal remining operations have exceeded the baseline loading. Both a monthly (single-observation) procedure and an annual procedure shall be applied.

(b) At least one sample result per month shall be obtained for a period of 12 months to characterize pollutant loadings for:

(1) baseline determination

(2) each annual monitoring period, it is required that at least one sample be obtained per month for a period of 12 months.

(c) Calculations described in this subchapter shall be applied to pollutant loadings.

(d) Each loading value shall be calculated as the product of a flow measurement and pollutant concentration taken on the same date at the same discharge sampling point, using standard units of flow and concentration.

(e) If the baseline concentration in a baseline sample is below the daily maximum effluent limits established in § 90.102, the baseline sample concentration may be replaced with daily maximum effluent limit for the purposes of some of the statistical calculations in this subchapter.

(f) The substituted values should be used for all methods in this subchapter except for:

(1)The calculation of the interquartile range (R) in Method 1 for the annual trigger (Step 3),

(2)In Method 2 for the single observation trigger (Step 3).

(g) The interquartile range (R) is calculated as the difference between the quartiles M_{-1} and M_1; the values for quartiles M_{-1} and M_1 should be calculated using actual loadings (based on measured concentrations) when they are used to calculate the interquartile range (R).

§90.312 Procedure for Calculating and Applying a Single-Observation (Monthly) Trigger

Two alternative methods are provided for calculating a single-observation trigger. One method must be proposed by the applicant to be approved and applied by the Department for any given remining permit.

(a) Method 1 for Calculating a Single Observation Trigger (L) is accomplished by completing the following steps:

(1) Count the number of baseline observations taken for the pollutant of interest. Label this number n. In order to sufficiently characterize pollutant loadings during baseline determination and during each annual monitoring period, it is required that at least one sample result be obtained per month for a period of 12 months.

(2) Order all baseline loading observations from lowest to highest. Let the lowest number (minimum) be $x_{(1)}$, the next lowest be $x_{(2)}$, and so forth until the highest number (maximum) is $x_{(n)}$.

(3) If fewer than 17 baseline observations were obtained, then the single observation trigger (L) will equal the maximum of the baseline observations ($x_{(n)}$).

(4) If at least 17 baseline observations were obtained, calculate the median (M) of all baseline observations: If n is odd, then M equals $x_{(n/2+1/2)}$.

(5) Next, calculate M_1 as the median of the subset of observations that range from the calculated M to the maximum $x_{(n)}$; that is, calculate the median of all x larger than or equal to M.

(6) Next, calculate M_2 as the median of the subset of observations that range from the calculated M_1 to $x_{(n)}$; that is, calculate the median of all x larger than or equal to M_1.

(7) Next, calculate M_3 as the median of the subset of observations that range from the calculated M_2 to $x_{(n)}$; that is, calculate the median of all x larger than or equal to M_2.

(8) Finally, calculate the single observation trigger (L) as the median of the subset of observations that range from the calculated M_3 to $x_{(n)}$.

(9) When subsetting the data for each of steps(a) (1) through (a)(4), the subset should include all observations greater than or equal to the median calculated in the previous step. If the median calculated in the previous step is not an actual observation, it is not included in the new subset of observations. The new median value will then be calculated using the median procedure, based on whether the number of points in the subset is odd or even.

(b) Method for applying the single observation trigger (L) to determine when the baseline level has been exceeded

(1) If two successive monthly monitoring observations both exceed L, immediately begin weekly monitoring for four weeks (four weekly samples).

(2) If three or fewer of the weekly observations exceed L, resume monthly monitoring

(3) If all four weekly observations exceed L, the baseline pollution loading has been exceeded.

(c) Method 2 for Calculating a Single Observation Trigger (L) is accomplished by completing the following steps:

(1) Follow Method 1 above to obtain M_1 (the third quartile, that is, the 75th percentile).

(2) Calculate M_{-1} as the median of the baseline data which are less than or equal to the sample median M.

(3) Calculate interquartile range, $R = (M_1 - M_{-1})$.

(4) Calculate the single observation trigger L as $L = M_1 + 3 * R$

(5) If two successive monthly monitoring observations both exceed L, immediately begin weekly monitoring for four weeks (four weekly samples).

(6) If three or fewer of the weekly observations exceed L, resume monthly monitoring

(7) If all four weekly observations exceed L, the baseline pollution loading has been

exceeded.

§90.312 Procedure for Calculating and Applying an Annual Trigger

Two alternative methods are provided for calculating the annual trigger. One method must be proposed by the applicant to be approved and applied by the Department for any given remining permit.

(a) Method 1 for Calculating and Applying an Annual Trigger (T) is accomplished by completing the following steps:

(1) Calculate M and M_1 of the baseline loading data as described above under Method 1 for the single observation trigger.

(2) Calculate M_{-1} as the median of the baseline data which are less than or equal to the sample median M.

(3) Calculate the interquartile range, $R = (M_1 - M_{-1})$.

(4) The annual trigger for baseline (Tb) is calculated as:

$Tb=M+(1.815*R)/SQRT(n)$

where n is the number of baseline loading observations.

(5) To compare baseline loading data to observations from the annual monitoring period, repeat steps 1-3 for the set of monitoring observations. Label the results of the calculations M' and R'. Let m be the number of monitoring observations.

(6) The subtle trigger (Tm) of the monitoring data is calculated as:

Tm=M-(1.815*R)/SQRT(n)

(7) If Tm > Tb, the median loading of the monitoring observations has exceeded the baseline loading.

(b). Method 2 for Calculating and Applying an Annual Trigger (T) is accomplished by completing the following steps:

(1) Let n be the number of baseline loading observations taken, and let m be the number of monitoring loading observations taken. In order to sufficiently characterize pollutant loadings during baseline determination and during each annual monitoring period, it is required that at least one sample result be obtained per month for a period of 12 months.

(2) Order the combined baseline and monitoring observations from smallest to largest.

(3) Assign a rank to each observation based on the assigned order: the smallest observation will have rank 1, the next smallest will have rank 2, and so forth, up to the highest observation, which will have rank n + m. If two or more observations are tied (have the same value), then the average rank for those observations should be used.

(4) Sum all the assigned ranks of the n baseline observations, and let this sum be S_n.

(5) Obtain the critical value (C) from Table 1.

(6) Compare C to S_n. If S_n is less than C, then the monitoring loadings have exceeded the baseline loadings.

Critical Values for the Wilcoxon-Mann-Whitney Test

(a) When n and m are less than 21, use Table 1. In order to find the appropriate critical value, match column with correct n (number of baseline observations) to row with correct m (number of monitoring observations).

Table 1—Critical Values (C) of the Wilcoxon-Mann-Whitney Test (for a one-sided test at the 0.001 significance level)

nm	10	11	12	13	14	15	16	17	18	19	20
10	66	79	93	109	125	142	160	179	199	220	243
11	68	82	96	112	128	145	164	183	204	225	248

12	**70**	**84**	**99**	**115**	**131**	**149**	**168**	**188**	**209**	**231**	**253**
13	**73**	**87**	**102**	**118**	**135**	**153**	**172**	**192**	**214**	**236**	**259**
14	**75**	**89**	**104**	**121**	**138**	**157**	**176**	**197**	**218**	**241**	**265**
15	**77**	**91**	**107**	**124**	**142**	**161**	**180**	**201**	**223**	**246**	**270**
16	**79**	**94**	**110**	**127**	**145**	**164**	**185**	**206**	**228**	**251**	**276**
17	**81**	**96**	**113**	**130**	**149**	**168**	**189**	**211**	**233**	**257**	**281**
18	**83**	**99**	**116**	**134**	**152**	**172**	**193**	**215**	**238**	**262**	**287**
19	**85**	**101**	**119**	**137**	**156**	**176**	**197**	**220**	**243**	**268**	**293**
20	**88**	**104**	**121**	**140**	**160**	**180**	**202**	**224**	**248**	**273**	**299**

(b) When n or m is greater than 20 and there are few ties, calculate an approximate critical value using the following formula and round the result to the next larger integer. Let N = n + m.

$$\text{Critical Value}=0.5*n(N+1)-3.0902*\text{SQRT}(n*M(N+1)/12)$$

(c) When n or m is greater than 20 and there are many ties, calculate an approximate critical value using the following formula and round the result to the next larger integer. Let S be the sum of the squares of the ranks or average ranks of all N observations. Let N = n + m.

$$\text{Critical Value}=0.5*n(N+1)-3.0902*\text{SQRT}(V)$$

In the preceding formula, calculate V using:

$$V=(n*m*S)/(N*(N-1)-(n*m*(N+1)^2/(4*(N-1))$$