

# 24

# *Subsidence Control Plan*

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<b>SUBJECT:</b>	<b>Subsidence</b>
<b>DATE:</b>	<b>May 22, 1996</b>

This procedure supersedes the March 23, 1993 memorandum and is in response to The Energy Policy Act of 1992 and the March 31, 1995 Federal Register.

1.
  - a. ***Subsidence Survey Map:*** The map described in 3.12 of the June 1, 1995 Surface Mining Reclamation Regulations must identify structures, location and type of domestic water sources, perennial and intermittent streams or renewable resource lands both on the permit area and adjacent areas within an angle draw of at least 30°. However, an angle other than 30-degree can be used based upon results of site specific analyses and demonstration that a different angle of draw is justified. Computer program packages predicting surface movement and deformation caused by underground coal extraction can be utilized.
  - b. ***Pre-subsidence Structural Survey:*** The survey described in Series 16 of the I & E Handbook shall be submitted and acknowledged by DEP prior to any underground extraction within the area defined by the angle shown in 1.a. above for any structure for which a survey is required. Structural surveys are required for all non-commercial or residential dwellings and structures related thereto. No mining shall take place in any area for which a structural survey is required until such survey is completed and acknowledged by DEP.

For areas of extraction that is less than or equal to 60 percent, a pre-subsidence structural survey exemption may be requested by the permittee; provided, it is demonstrated that damage to the structure(s) will not occur (adequate support).

In areas of developmental mining (*less than or equal to 60 percent extraction*), a postponement of the pre-subsidence structural survey may be requested by the permittee; provided, it is demonstrated that damage to the structure(s) will not occur. No mining (*extraction greater than 60 percent*) within the angle of draw shall occur until the pre-subsidence structural survey is completed.

In areas for which a pre-subsidence structure survey exemption and/or postponement is granted and the percent extraction exceeds 60 percent, the exemption and/or postponement for the structural survey is voided for the entire underground mining operation. In addition, the presumption of causation will apply to any damage to structure(s) as a result of earth movement within a 30-degree angle of draw from any underground extraction.

If water supply is any other than a public utility, the permittee must submit information described in Series 16 of the I & E Handbook with the request for exemption or postponement.

**NOTE: 30-degree angle of draw is only for survey purpose. 15-degree angle of critical deformation is for protection zone and must be clearly denoted on the subsidence map.**

**c. *Schedule of Compliance:***

- **Not-started Permits:** Both a. and b. above must be submitted to and acknowledged by DEP prior to initiation of any mining activities. No mining shall take place in any area for which a structural survey is required until such survey is submitted to and acknowledged by DEP.
- **Existing Permits with Reserves:** Both a. and b. above must be submitted to and acknowledged by DEP **no later than August 1, 1996**. However, both a. and b. above are required for previously mined areas **only** if second mining is contemplated.
- A permittee may submit for review existing surveys if the permittee believes they have surveyed an area previous to this policy to the extent that it complies with this policy. This information may be deemed acceptable provided it satisfies the intent of this policy, provides sufficient information to adequately investigate complaints, and the affected party has been notified and concurs.
- **Previously mined areas:** Both a. and b. above are **not required** for areas where mining was completed prior to **August 1, 1996**. However, both a. and b. above are required for previously mined areas **only** if second mining is contemplated.

**2. *Presumption of Causation:*** If alleged subsidence damage to any non-commercial or residential dwellings and structures related thereto occurs as the result of earth movement within the area which a pre-subsidence structure survey is required, a rebuttable presumption exists that the underground mining operation caused the damage.

- a. If the permittee was denied access to the land or property for the purpose of conducting the pre-subsidence survey, no presumption of causation will exist.
- b. The presumption will be rebutted if, for example, the evidence establishes that:
  - the damage predated the mining in question

- the damage was proximately caused by some other factor or factors and was not proximately caused by subsidence; or
  - the damage occurred outside the surface area within which subsidence was actually caused by the mining in question.
- c. In any determination whether damage to protected structures was caused by subsidence from underground mining, all relevant and reasonably available information will be considered by the DEP.

**3. *Liability:*** Regardless of the date of issuance, permittee is liable for subsidence damage caused by underground mining that occurred after October 24, 1992.

**4. *Maintenance Cost of Replacement Water Supply:*** Replacement of water supply includes an equivalent water delivery system. Therefore, the permittee is responsible for payment of operation and maintenance cost of the equivalent water delivery system which is in excess of customary and reasonable delivery cost for the premining water supply. Upon agreement by the permittee and the water supply owner, the obligation to pay such operation and maintenance costs may be satisfied by a one-time payment in the amount which covers the present worth of the increased annual operation and maintenance cost agreed to by the permittee and the water supply owner.

**5. *Bonding for Subsidence Damage:*** When subsidence related damage occurs to lands, structures, or water supply, and if DEP issues violation(s), the DEP may extend the 90-day abatement period to complete repairs, but shall not exceed one year from date of violation notice. Provided, however, the permittee demonstrates, in writing, that it would be unreasonable to complete repairs within the 90-day time period. If extended beyond 90-days, as part of the remedial measures, the permittee shall post an escrow bond to cover the estimated costs of repairs.

**NOTE: Memorandums dated March 7, 1995 and April 24, 1995 regarding groundwater wells and protection of streams remain in effect. (*copies attached*)**

**SUBJECT: Groundwater Well Monitoring Plans**

**DATE: March 7, 1995**

The West Virginia Surface Mining Reclamation Regulations at 38-2-3.12.(a)(8) require that an application for an underground coal mining permit contain a subsidence control plan which includes a description of monitoring plans to determine the commencement and degree of subsidence so that other appropriate measures can be taken to prevent, reduce or correct material damage. Additionally, the Regulations at 38-2-3.22(b)(4) require that if the determination of the probable hydrologic consequences (PHC) indicates that a currently used or significant groundwater resource is likely to be contaminated, diminished, or interrupted, additional information shall be provided as necessary to fully evaluate such probable hydrologic consequences as water availability and suitability for both the premining and postmining land use in order to plan remedial and reclamation activities such as alternative water sources.

With respect to groundwater wells which have been determined to have the potential to be adversely impacted by underground coal mining, it shall be the position of this agency to require that the permit contain a groundwater well monitoring plan which includes at a minimum, the following:

- Which wells, if not all, that must be monitored in order to determine if any adverse impacts are occurring. The decision as to which wells must be monitored shall be made by the Secretary during a review of the permit/application. If the Secretary determines that the necessary data cannot be obtained from existing residential groundwater wells, then the permittee/applicant shall be required to install an adequate number of properly designed monitoring wells.
- The frequency, duration and parameters of monitoring for all applicable wells, will be determined by the Secretary.
- An acknowledgement by the permittee that for any well that is determined to have been adversely impacted by their mining operation, an alternative source of water will be supplied to the well user within 24 hours of the determination. The monitoring plan shall clearly identify proposed alternative water sources.
- For existing permitted underground mining operations, the I & E Inspector, in consultation with Permit Review, shall review the subsidence control and groundwater well monitoring plans to determine their adequacy. This

determination may necessitate that a permit revision application by submitted by the permittee.

<b>SUBJECT:</b>	<b>Protection of Perennial and Intermittent Streams</b>
<b>DATE:</b>	<b>April 24, 1995</b>

The West Virginia Surface Mining Reclamation Regulations at 38-2-3.12(a)(8) require that an application for an underground coal mining permit contain a subsidence control plan which includes a description of monitoring plans to determine the commencement and degree of subsidence so that other appropriate measures can be taken to prevent, reduce or correct material damage. Additionally, the Regulations at 38-2-3.22(c)(4) require that if the determination of the probable hydrologic consequences (PHC) indicates that a currently used or significant surface water resource is likely to be contaminated, diminished, or interrupted, additional information shall be provided as necessary to fully evaluate such probable hydrologic consequences as water availability and suitability for both the premining and postmining land use in order to plan remedial and reclamation activities.

With respect to perennial streams and significant intermittent streams (whose loss could cause material damage to the hydrologic balance) which have been determined to have the potential to be adversely impacted by underground coal mining, it shall be the position of this agency to require that the permit contain a subsidence plan which includes at a minimum, the following:

1. A survey that identifies all perennial and intermittent streams within the critical angle of deformation. The survey shall also identify which streams that could be materially damaged by subsidence.
2. A stream monitoring plan in order to determine if any adverse impacts are occurring. The decision as to which streams must be monitored shall be made by the Secretary during a review of the permit/application. The frequency and duration of monitoring will be determined by the Secretary.
3. A mining plan that clearly defines the measures that will be taken to prevent or minimize material damage to perennial and significant intermittent streams prior to mining. This could include but is not limited to stream lining and in some cases prohibition of mining if prevention of material damage can not be adequately documented to the satisfaction of the Secretary.
4. A contingency plan which defines the mitigative/remedial measures and timetable.

For existing permitted underground mining operations, the I & E Inspector, in consultation with Permit Review, shall review the subsidence plans to determine their adequacy. This determination may necessitate that a permit revision application be submitted by the permittee.

**Subject: Underground Mine Outcrop Barriers and Post Mining Hydrology Evaluation**

**Date: May 22, 1996 Revised: November 15, 2012**

**Approval: Lewis Halstead**

**Purpose:** This procedure is intended to prevent the occurrence of a “mine blowout,” and to prescribe the requirements for the evaluation of post underground mining hydrologic impacts prior to bond reduction for operations that proposes underdrainage mining and/or where the Secretary has determined the application has an elevated risk of blowout or offsite impacts. “Blowouts” are a rapid release of large volume of water impounded in underground mine workings to the land surface due to the failure of outcrop barrier pillar.

1. The permit applicant must leave an unmined section of coal where the coal seam approaches the land surface so as to create an outcrop barrier pillar except:
  - a. Where the applicant has demonstrated in the permit application that based upon the geologic and hydrologic conditions in the permit area no accumulation of water in the underground workings will occur;
  - b. In those locations where the applicant has proposed mine entries for ventilation and transportation of men and materials.
  - c. Areas where a determination has been made that hydrologic head relief is required.
2. The permit applicant must demonstrate the outcrop barrier is of sufficient width to support the overburden and prevent its failure and sudden release of water due to water pressure against the unmined coal. The applicant must provide an outcrop barrier pillar design based on sound engineering principles. An overburden blow out and stability analysis must be performed and included in the permit package.
3. When the overburden blow out and stability analysis indicates that the coal seam is the weakest point, the permit applicant may use the Empirical Formula (commonly known as the Rule of Thumb) which states that the width of the outcrop barrier  $W = 50 + H$  where  $W$  is the width of the coal barrier in feet and  $H$  is the maximum hydrostatic head that can be built on the outcrop barrier.
4. The outcrop barrier design must also consider seepage analysis in estimating the flow that will be expected from the barrier. The outcrop barrier may be lengthened if estimated flow rates are such that surface water hydrology is likely to be adversely impacted. Alternatively, methods to decrease seepage by use of impermeable materials behind the barrier including curtain grouting may be prescribed.

5. Where underground mining is proposed to be conducted to an adjacent abandoned waterlogged mine, the effect of additional head of water must be considered by the permit applicant in the design of internal and outcrop barriers. For this purpose, the accuracy of maps of the abandoned mine must be verified by additional borings or by the use of geophysical survey techniques when determined necessary.
6. The width of all outcrop barriers as determined from the design computations must be plotted on the topographic map and included in the permit application. The seam elevations along the outcrop line, location and elevations of springs and seeps must also be plotted on the topographic map. Methods to conduct the water flows safely from seeps downstream of the barrier must be incorporated in the permit.
7. Where multi-seam mining is proposed, the permittee must demonstrate that outcrop barriers in the upper seam are underlain by solid coal barriers in the lower seam, except as provided under item 1.b or where the stability analysis shows that partial mining can occur and that remaining pillars in the lower seam will support the outcrop barriers in the upper seam. The permittee must demonstrate that developmental maps for multi-seam mining include information relating to proposed underground barriers, where mining has already occurred and where it is planned.
8. The permit applicant must demonstrate that procedures for the prevention of buildup of hydrostatic head beyond the designed water level is assured by drilling relief wells or using angled boreholes into the hillside at a point in the overburden for direct passage of mine water to the surface are included in the permit. However, the uses of these methods which result in gravity discharge from acid producing coal seam are prohibited. Alternatively, pumping of water from deep mine workings to the surface may be included in the permit package. Where such procedures for prevention of the buildup of water beyond the designed water level are used, the permittee must demonstrate that appropriate water treatment methods are included in the permit.

Applications that proposes underdrainage mining and/or where the Secretary has determined the application has an elevated risk of blowout or other adverse offsite impacts applicant must provide monitoring plans to include measurements on hydraulic head, quality and quantity of water discharged from workings and verification of outcrop barriers on a regular basis, as determined by the reviewer and/or the inspector. This information shall be used by the permittee to perform an analysis of surface and groundwater quantity and quality that will be prior to granting bond reduction. This analysis must be submitted at least 180 days prior to submittal of initial release request. The analysis will include an assessment of the data to show that material damage has

been prevented. The analysis can include an evaluation of any trends which may exist in the available data that which demonstrate the elevated risk of blowout or other adverse offsite impacts have been minimized and material damage have been prevented.

**This policy is in the I & E Handbook**

<b>SUBJECT:</b>	<b>Presubsidence Structure Survey Procedures</b>
<b>DATE:</b>	<b>June 30, 1995</b>

The survey process begins with the operator informing in writing all residents or owners of manmade dwellings or manmade structures located within a thirty (30) degree angle of draw projected from the mining limits. This notification must state the reason for the survey and that denial of access will mean that no presumption of causation will exist. The notification must be mailed or delivered to the resident/owner via certified mail or signed and witnessed receipt. The certification number will be referenced on the letter.

Surveys must be submitted and acknowledged by this agency prior or simultaneously to owners and residents receiving the Notice (6 month notice) described in 38-2-16.1 of the West Virginia Surface Mining Reclamation Regulations. No mining may take place in any area for which a survey is required until such survey is completed, and acknowledged by this office.

The list of residents and owners shall be reviewed and updated by the permittee at a minimum annually for new structures and residents. Within fifteen (15) days of becoming aware of any changes to the original survey (new residents/structures/etc.) the permittee must complete and submit to this agency a revised survey. Any new individuals and /or structures must have a survey if mining (mineral extraction) in the area is not completed.

A copy of the notice of the right to a survey along with the return receipt must be submitted to the appropriate Regional Office. A "Notice" will be mailed to the permittee advising the permittee that these surveys must be conducted for the insurance carrier who has indemnified the permittee for subsidence related damages. If carrier elects to engage the services of another entity to conduct the survey, the carrier must certify, in writing, that this person or entity is qualified to do such work.

Once the Regional Office receives the surveys, they shall be logged in and date stamped. Then, one copy of each survey will be submitted to Headquarters for review.

Upon review by headquarters staff, if the survey is found to be complete and adequate, it will be sent back to the regional office. The regional office will then notify

the permittee that the survey has been reviewed and appears to be of sufficient detail to identify the condition of the structure. The permittee shall provide a copy to the owner/resident at this time.

A "log" will be kept at each Regional Office to track each survey during the process. Each survey shall be entered in the log book at the Regional Office and contain the following information:

- 1.) Resident/Owner
- 2.) SMA or Permit Number
- 3.) Permittee name
- 4.) Date Notification received by owner/resident
- 5.) Date "Notice" sent to permittee
- 6.) Date "Notice" received by permittee
- 7.) Date survey received
- 8.) Date survey acknowledged (accepted)
- 9.) Date acknowledgment letter sent

The following guidelines must be adhered to when reviewing a presubsidence survey. The inspector must perform the initial review with final review being conducted by the supervisor. The guidelines are provided to assist in evaluating whether the survey adequately documents pre-subsidence damage and other physical conditions which could be affected by subsidence. Each survey of a building and structures related thereto should be bound or stapled together and shall conform to the following format:

- Name of owner
- Name of tenant (if applicable)
- Permittee and SMA# or Permit #
- A copy of the Notification for the Presubsidence Survey. If access is denied, include documentation.
- Address of structure, description of structure and location identifier keyed to the subsidence survey map
- Mailing address of owner and tenant
- Plan view of the relative location of structures surveyed (scale not required)
- General description of structure (number of stories, construction materials for frame, construction material for exterior finish and approximate age, if available).
- A general description of the survey methods and direction of progression of the survey, including a key to any abbreviations used.
- Sufficient exterior photographs (equal to the standard 35 mm negative film format) to illustrate a wide angle full frame view of each exterior wall, close-up photographs to illustrate any pre-subsidence damages noted, and

mid-range photographs to illustrate relationships of close-up photos to wide angle photos. Exterior photos should also illustrate the condition of visible foundation walls, sidewalks, steps, porches, chimneys, well houses, fences, utilities, garages, out buildings and other exterior structures.

- Information on the type of water supply (public utility, private multi-dwelling water systems, well(s) spring, cistern).
- If water supply is any other than a public utility, survey must include water analysis (tds or spec. cond. at 25 degrees centigrade, pH, acidity, alkalinity, total Fe, total manganese, and sulfates) and a description of the type of system and treatment being used. For wells, give type (drilled or dug) and, if available well log, depth, age, depth and type of casing or lining, static water level, flow data, pump capacity, drilling contractor and indicate source of data.
- Documentation of the conditions of each interior room to include comments on type of finishing material for each interior wall, ceiling and floor, and notations on the location and approximate dimensions of any defect or unusual condition. Interior condition may be illustrated by drawings, sketches, narrative description and/or 35 mm (or equivalent) photographs.
- A notation of any unusual construction technique or method, especially extra-ordinary or sub-standard ("not-to-code") materials or spacings, absence of footer or foundations, pre-fabricated or modular construction, previous relocation of the structure, unusual lot construction or foundation preparation and similar unusual conditions.
- A notation describing any portion of the structure not documented and explanation of why.
- Signature of the person conducting the survey, name and address of person or firm conducting the survey and a copy of insurance carrier documents certifying that the person or firm is qualified to conduct presubsidence surveys.

Photographs submitted with a survey may be contact prints of 35 mm negatives if information on how to obtain full size prints is provided. Videos can be used as a supplement only. Items marked with “••” above may be entirely documented by photographs if sufficient photographs are included to adequately illustrate the required information.

**NOTE: This policy is also in the I & E Handbook, Series 16, page 1.**

<b>SUBJECT:</b>	<b>Clarification of Subsidence Memo and/or New Regulations</b>
<b>DATE:</b>	<b>July 22, 1997</b>

Since the DEP/OMR procedure for “Subsidence Survey Maps” and “Presubsidence Surveys” were signed on May 28, 1996, there has been debate over “whether the 30° angle of draw is measured from mining limits or from limits of 60% extraction or both.” Also, the question arose as to where the 15° angle of critical deformation is measured? The 15° angle of critical deformation has always been measured from any underground mining.

The Federal Regulations 817.121(c)(4) state: “within an area determined by projecting a 30 degree angle of draw from the outermost boundary of any underground mine working to the surface of the land.”

The following is the clarification of the policy and/or new regulations.

- 1) A survey map is required showing 30° from any underground mining.
- 2) An I & E or permitting exemption from pre-subsidence surveys, if less than 60% extraction, may be requested by the company. This demonstration has to satisfy the agency that subsidence will not impact a structure within the 30° angle of draw measured from any coal removal and the 30° angle of draw from the >60% extraction area. This area will be exempt from pre-subsidence surveys if the exemption is approved.
- 3) The presumption of causation will apply within 30° angle of draw from >60% extraction, if an exemption is granted. If no exemption, then presumption of causation is within 30° from any mining.
- 4) For alleged damage in areas outside of the 30° angle of draw of any coal removal, and for any damage in exempted areas, investigations will be undertaken (by DEP) to determine if subsidence caused the damage and who is liable for damage.

<b>SUBJECT:</b>	<b>Water Rights and Replacement</b>
<b>DATE:</b>	<b>July 1, 1995</b>

Upon receipt of notification that a water supply was adversely affected by mining, the permittee shall provide drinking water to the user within twenty-four (24) hours.

Within two (2) weeks, the permittee shall have the user hooked up to a temporary water supply. The temporary supply shall be hooked up to existing plumbing, if any, to allow the user to conduct all normal activities associated with domestic water use. This includes drinking, cooking, bathing, washing, non commercial farming, and gardening.

Within two (2) years of notification the permittee shall have the user connected to a permanent water supply.

The permittee is responsible for payment of operation and maintenance costs on a replacement water supply in excess of reasonable and customary delivery costs that the user incurred.

Upon agreement by the permittee and the user (owner), the obligation to pay such operation and maintenance costs may be satisfied by a one-time lump sum amount agreed to by the permittee and the water supply user (owner).

**This policy is also in the I & E Handbook, Series 14**