
Rules of
Department of Natural Resources
Division 40—Land Reclamation Commission
Chapter 2—Land Reclamation Performance
Requirements for Coal Strip Mining

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Title 10—DEPARTMENT OF NATURAL RESOURCES

Division 40—Land Reclamation Commission

Chapter 2—Land Reclamation Performance Requirements for Coal Strip Mining

10 CSR 40-2.010 Definitions

PURPOSE: This rule defines terms used throughout the land reclamation performance requirements for coal strip mining of this chapter and in keeping with sections 444.510 and 444.535, RSMo.

Editor's Note: The secretary of state has determined that the publication of this rule in its entirety would be unduly cumbersome or expensive. The entire text of the material referenced has been filed with the secretary of state. This material may be found at the Office of the Secretary of State or at the headquarters of the agency and is available to any interested person at a cost established by state law.

- (1) Acid drainage means water with a pH of less than 6.0 discharged from active or abandoned mines and from areas affected by coal mining operations.
- (2) Acid-forming materials means earth materials that contain sulfide mineral or other materials which, if exposed to air, water or weathering processes, will cause acids that may create acid drainage.
- (3) Affected land means the pit area or area from which overburden has been removed, or upon which overburden has been deposited.
- (4) Approximate original contour means that surface configuration achieved by backfilling and grading of the mined area so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls and spoil piles eliminated.
- (5) Aquifer means a zone, stratum or group of strata that can store and transmit water in sufficient quantities for a specific use.
- (6) Coal means combustible carbonaceous rock, classified as anthracite, bituminous, subbituminous or lignite by American Society for Testing and Materials (ASTM) designation 0-388-66.
- (7) Combustible material means organic material that is capable of burning either by fire or through a chemical process (oxidation) accompanied by the evolution of heat and a significant temperature rise.
- (8) Commission means the Land Reclamation Commission.
- (9) Compaction means the reduction of pore spaces among the particles of soil or rock, generally done by running heavy equipment over the earth materials.
- (10) Director means the director of the Land Reclamation Commission.
- (11) Diversion means a channel, embankment or other man-made structure constructed for the purpose of diverting water from one (1) area to another.
- (12) Downslope means the land surface between a valley floor and the projected outcrop of the lowest coalbed being mined along each highwall.
- (13) Embankment means an artificial deposit of material that is raised above the natural surface of the land and used to contain, divert or store water, support roads or railways, or other similar purposes.
- (14) Federal lands means any land, including mineral interests, owned by the United States without regard to how the United States acquired ownership of the lands and without regard to the agency having responsibility for management of those lands.
- (15) Flood irrigation means irrigation through natural overflow or the temporary diversion of high flows in which the entire surface of the soil is covered by a sheet of water.
- (16) Gob means that portion of refuse consisting of waste coal or bony coal of relatively large size which is separated from the marketable coal in the cleaning process of solid refuse material, not readily waterborne or pumpable, without crushing.
- (17) Groundwater means subsurface water that fills available openings in rock or soil materials such that they may be considered water saturated.
- (18) Highwall means that side of the pit adjacent to unmined land.
- (19) Hydrologic balance means the relationship between the quality and quantity of inflow to outflow from, and storage in, a hydrologic unit such as a drainage basin, aquifer, soil zone, lake or reservoir. It encompasses the quantity and quality relationships between precipitation, runoff, evaporation and the change in ground and surface water storage.
- (20) Hydrologic regime means the entire state of water movement in a given area. It is a function of the climate, and includes the phenomena by which water first occurs as atmospheric water vapor, passes into a liquid or solid form and falls as precipitation, then moves along or into the ground surface, and returns to the atmosphere as vapor by means of evaporation and transpiration.
- (21) Impoundment means a closed basin formed naturally or artificially built, which is dammed or excavated for the retention of water, sediment or waste.
- (22) Imminent danger to the health and safety to the public means the existence of any condition, or practice or any violation of a permit or other requirement of this chapter in a coal strip mining and reclamation operation, which condition, practice or violation could reasonably be expected to cause substantial physical harm to persons outside the permit area before that condition, practice or violation can be abated. A reasonable expectation of death or serious injury before abatement exists if a rational person, subjected to the same condition or practice giving rise to the peril, would not expose him/herself to the danger during the time necessary for abatement.
- (23) Intermittent or perennial stream means a stream or part of a stream that flows continuously during all (perennial) or for at least one (1) month (intermittent) of the calendar year as a result of groundwater discharge or surface runoff. The term does not include an ephemeral stream which is one that flows for less than one (1) month of a calendar year and only in direct response to precipitation in the immediate watershed and whose channel bottom is always above the local water table.
- (24) Leachate means a liquid that has percolated through soil, rock or waste and has extracted, dissolved or suspended materials.
- (25) Noxious plants means species that have been included on official Missouri lists of noxious plants.
- (26) Operator means any person, firm or corporation engaged in or controlling a strip mining operation.
- (27) Outslope means the exposed area sloping away from a bench or terrace being constructed as a part of a coal strip mining and reclamation operation.



(28) Overburden, as applied to the strip mining of coal, means all of the earth and other materials which lie above natural deposits of coal and includes earth and other materials disturbed from their natural state in the process of strip mining, excluding topsoil.

(29) Person means any individual, partnership, copartnership, firm, company, public or private corporation, association, joint stock company, trust, estate, political subdivision, or any agency, board, department or bureau of the state or federal government, or any other legal entity whatever, which is recognized by law as the subject of rights and duties.

(30) Pit means the place where coal is being or has been mined by strip mining.

(31) Productivity means the vegetative yield produced by a unit area for a unit of time.

(32) Recharge capacity means the ability of the soils and underlying materials to allow precipitation and runoff to infiltrate and reach the zone of saturation.

(33) Roads means access and haul roads constructed, used, reconstructed, improved or maintained for use in coal strip mining and reclamation operations, including use by coal-hauling vehicles leading to transfer, processing or storage areas. The term includes any such road used and not graded to approximate original contour within forty-five (45) days of construction other than roads used for topsoil removal and coal haulage roads within the pit area. Roads maintained with public funds such as all federal, state, county or local roads are excluded.

(34) Recurrence interval means the precipitation event expected to occur, on the average, once in a specified interval. For example, the ten (10)-year, twenty-four (24)-hour precipitation event would be that twenty-four (24)-hour precipitation event expected to be exceeded on the average once in ten (10) years. Magnitude of these events are as defined by the National Weather Service Technical Paper No. 40, *Rainfall Frequency Atlas of the U.S.*, May 1961, or equivalent regional or rainfall probability information developed from the National Weather Service.

(35) Runoff means precipitation that flows overland before entering a defined stream channel and becoming stream flow.

(36) Safety factor means the ratio of the available shear strength to the developed shear stress on a potential surface of sliding determined by accepted engineering practice.

(37) Sediment means undissolved organic and inorganic material transported or deposited by water.

(38) Sedimentation pond means any natural or artificial structure or depression used to remove sediment from water and store sediment or other debris.

(39) Significant, imminent environmental harm to land, air or water resources is determined as follows:

(A) An environmental harm is any adverse impact on land, air or water resources, including, but not limited to, plant and animal life;

(B) An environmental harm is imminent if a condition, practice or violation exists which—

1. Is causing environmental harm; or
2. May reasonably be expected to cause environmental harm at any time before the end of a reasonable abatement time; and

(C) An environmental harm is significant if that harm is appreciable and not immediately repairable.

(40) Slope means average inclination of a surface, measured from the horizontal. Normally expressed as a unit of vertical distance to a given number of units of horizontal distance (for example, 1v:5h = 20% = 11.3°).

(41) Soil horizons means contrasting layers of soil lying one (1) below the other, parallel or nearly parallel to the land surface. Soil horizons are differentiated on the basis of field characteristics and laboratory data. The three (3) major soil horizons are—

(A) A Horizon. The uppermost layer in the soil profile often called the surface soil. It is the part of the soil in which organic matter is most abundant and where leaching of soluble or suspended particles is the greatest;

(B) B Horizon. The layer immediately beneath the A horizon and often called the subsoil. This middle layer commonly contains more clay, iron or aluminum than the A or C horizon; and

(C) C Horizon. The deepest layer of the soil profile. It consists of loose material or weathered rock that is relatively unaffected by biologic activity.

(42) Spoil means overburden that has been removed during surface mining.

(43) Stabilize means any method used to control movement of soil, spoil piles or areas of disturbed earth and includes increasing bearing capacity, increasing shear strength, draining, compacting or revegetating.

(44) Strip mining means mining by removing the overburden lying above natural deposits of coal and mining directly from the natural deposits exposed by strip mining, and includes mining of exposed natural deposits of coal over which no overburden lies.

(45) Subirrigation means irrigation of plants with water delivered to the roots from underneath.

(46) Surface water means water, either flowing or standing, on the surface of the earth.

(47) Suspended solids means organic or inorganic materials carried or held in suspension in water that will remain on a 0.45 micron filter.

(48) Toxic-forming materials means earth materials or wastes which, if acted upon by air, water, weathering or microbiological processes, are likely to produce chemical or physical conditions in soils or water that are detrimental to biota or uses of water.

(49) Toxic-mine drainage means water that is discharged from active or abandoned mines and other areas affected by coal mining operations and which contains a substance which, through chemical action or physical effects, is likely to kill, injure or impair biota commonly present in the area that might be exposed to it or is detrimental to use of water.

(50) Valley fill and head-of-hollow fill means a structure consisting of any materials other than waste placed so as to encroach upon or obstruct to any degree any natural stream channel other than those minor channels located on highland areas where overland flow in natural rills and gullies is the predominant form of runoff. These fills are normally constructed in the uppermost portion of a V-shaped valley in order to reduce the upstream drainage area (head-of-hollow fills). Fills located farther downstream (valley fills) must have larger diversion structures to minimize infiltration. Both fills are characterized by rock underdrains and are constructed in compacted lifts from the toe to the upper surface in a manner to promote stability.

(51) Waste means earth materials which are combustible, physically unstable, acid- or toxic-forming, wasted or otherwise separated from product coal and are slurried or otherwise transported from coal processing facilities or preparation plants after physical or chemical processing, cleaning or concentrating of coal.

(52) Water table means upper surface of a zone of saturation, where the body of groundwater is not confined by an overlying impermeable zone.

*Auth: sections 444.510 and 444.535, RSMo (1986). *Original rule filed July 13, 1978, effective Jan. 13, 1979.*

**Original authority: 444.510, RSMo (1971), amended 1976, 1979, 1990; 444.535, RSMo (1978), amended 1988.*

10 CSR 40-2.020 General Obligations for Permits, Maps, Signs and Markers

PURPOSE: This rule sets forth general obligations as to permits, maps, signs and markers applicable to the land reclamation performance requirements for coal strip mining and in keeping with sections 444.535 and 444.550, RSMo.

(1) Authorizations to Operate. A copy of all current permits, licenses, approved plans or other authorizations to operate the mine shall be available for inspection at or near the mine site.

(2) Mine Maps. Any person conducting coal strip mining and reclamation operations shall submit to the commission accurate maps, prepared and certified by a registered professional engineer, of the mine and permit area at a scale of one inch to five hundred feet (1" = 500') or a larger scale as follows:

(A) Two (2) copies of a map showing—

1. The lands from which coal has not yet been removed and the lands and structures which have been used or disturbed to facilitate mining;

2. An identification of the area to correspond with the application;

3. The boundaries of surface properties and names of owners of the area of land to be affected and, if known to the operator, adjacent deep mines and the name of the owner(s) of the surface area within six hundred sixty feet (660') of any part of the area of land to be affected;

4. The names and locations of all streams, creeks or other bodies of public water, roads, buildings, cemeteries, oil and gas wells, and utility lines on or within six hundred sixty feet (660') of the area to be mined;

5. The boundaries of the area of land affected shown by appropriate markings, the cropline of the seam or deposit to be mined and the total number of acres involved in the area of land affected;

6. The date on which the map was prepared, the north point and the section, township and range;

7. An identification of pit areas by name or number and the code for those identifications in a legend on the map; and

8. An identification of the permitted area, areas previously affected but not graded, areas previously affected and graded but not reseeded, and areas previously affected and graded and reseeded by a color code or some equally distinguishable code and that the code be shown in a legend on the maps; and

(B) Two (2) copies of a map showing—

1. A comprehensive water management plan for the area of land affected, including the sources of water inflow, the drainage plan on and away from the area of land affected, indicating the directional flow of water, constructed drainways, constructed washing, cleaning or retaining ponds or reservoirs and the construction plans of them, natural waterways used for drainage, and the nearest streams or tributaries receiving the discharge or overflow, the plan for control or prevention of soil erosion as required by section 444.610.1(2), RSMo, and the plan for control of the inflow of water and leaching or discharge of water, acid, oil and other substances required by section 444.610.1(7), RSMo;

2. The location or information on all structures, instruments and water flows required or regulated by 10 CSR 40-2.060; and

3. The date on which the map was prepared, the north point and the section, township and range.

(3) Specifications for Signs and Markers. All signs required to be posted shall be of a standard design that can be seen and read easily and shall be made of durable material. The signs and other markers shall be maintained during all operations to which they pertain and shall conform to local ordinances and codes.

(4) Mine and Permit Identification Signs. Signs identifying the mine areas shall be displayed at all points of access to the permit area from public roads and highways. Signs shall show the name, business address and telephone number of the operator and identification numbers of current mining and reclamation permits or other authorizations to operate. These signs shall not be removed until after release of all bonds.

(5) Perimeter Markers. The perimeter of the permit area shall be clearly marked by durable and easily recognized markers.

(6) Buffer Zone Markers. Buffer zones as defined in 10 CSR 40-2.060 shall be marked in a manner consistent with the perimeter

markers along the interior boundary of the buffer zone.

(7) Blasting Signs. If blasting is necessary to conduct coal strip mining operations, signs reading **Blasting Area** shall be displayed conspicuously at the edge of blasting areas along access and haul roads within the mine property. Signs reading **Blasting Area** and explaining the blasting warning and all-clear signals shall be posted at all entrances to the permit area.

(8) Topsoil Markers. Where topsoil or other vegetation supporting material is segregated and stockpiled according to 10 CSR 40-2.050(4), the stockpiled material shall be marked. Markers shall remain in place until the material is removed.

*Auth: sections 444.535 and 444.550, RSMo (1986). *Original rule filed July 13, 1978, effective Jan. 13, 1979.*

**Original authority: 444.535, RSMo (1978), amended 1988 and 444.550, RSMo (1971), amended 1976, 1990.*

10 CSR 40-2.030 Restoration of Affected Land to Equivalent Prior Use

PURPOSE: This rule complies with section 444.535.1(2), RSMo by setting forth the requirements for operators with respect to strip mining of coal to restore the affected land to a condition capable of supporting as a minimum the use of the land prior to mining.

(1) General. All disturbed areas shall be restored to—

(A) Conditions that are capable of supporting the uses which they were capable of supporting before any mining; or

(B) Higher or better uses achievable under criteria and procedures of section (4) of this rule.

(2) Determining Premining Use of Land. The premining uses of land to which the post-mining land use is compared shall be those uses which the land previously supported if the land had not been previously mined and had been properly managed.

(A) The postmining land use for land that has been previously mined and not reclaimed shall be judged on the basis of the highest and best use that can be achieved and is compatible with surrounding areas.

(B) The postmining land use for land that has received improper management, shall be judged on the basis of the premining use of



surrounding lands that have received proper management.

(C) If the premining use of the land was changed within five (5) years of the beginning of mining, the comparison of postmining use to premining use shall include a comparison with the historic use of the land as well as its use immediately preceding mining.

(3) Land-Use Categories. Land use is categorized in the following groups. Change from one (1) to another land-use category in premining to postmining constitutes an alternate land use and the operator shall meet the requirements of section (4) of this rule and all other applicable environmental protection performance standards of this chapter:

(A) Heavy Industry. Manufacturing facilities, powerplants, airports or similar facilities;

(B) Light Industry and Commercial Services. Office buildings, stores, parking facilities, apartment houses, motels, hotels or similar facilities;

(C) Public Services. Schools, hospitals, churches, libraries, water treatment facilities, solid waste disposal facilities, public parks and recreation facilities, major transmission lines, major pipelines, highways, underground and surface utilities, and other servicing structures and appurtenances;

(D) Residential. Single- and multiple-family housing (other than apartment houses) with necessary support facilities. Support facilities may include commercial services incorporated in and comprising less than five percent (5%) of the total land area of housing capacity, associated open space, and minor vehicle parking and recreation facilities supporting the housing;

(E) Cropland. Land used primarily for the production of cultivated and close-growing crops for harvest alone or in association with sod crops. Land used for facilities in support of farming operations are included;

(F) Rangeland. Includes rangelands and forest lands which support a cover of herbaceous or scrubby vegetation suitable for grazing or browsing use;

(G) Hayland or Pasture. Land used primarily for the long-term production of adapted, domesticated forage plants to be grazed by livestock or cut and cured for livestock feed;

(H) Forest Land. Land with at least twenty-five percent (25%) tree canopy or land at least ten percent (10%) stocked by forest trees of any size, including land formerly having had that tree cover and that will be naturally or artificially reforested;

(I) Impoundments of Water. Land used for storing water for beneficial uses such as stock ponds, irrigation, fire protection, recreation or water supply;

(J) Fish and Wildlife Habitat and Recreation Lands. Wetlands, fish and wildlife habitat and areas managed primarily for fish and wildlife or recreation; and

(K) Combined Uses. Any appropriate combination of land uses where one (1) land use is designated as the primary land use and one (1) or more other land uses are designated as secondary land uses.

(4) Criteria for Approving Alternative Postmining Use of Land. An alternative postmining land use may be approved in the reclamation plan, after consultation by the commission with the landowner or the land management agency having jurisdiction over state or federal lands, if the following criteria are met:

(A) The proposed land use is compatible with adjacent land use and, where applicable, with existing local, state or federal land use policies and plans. A written statement of the views of the authorities with statutory responsibilities for land-use policies and plans shall accompany the reclamation plan. The operator shall obtain any required approval of local, state or federal land management agencies, including any necessary zoning or other changes necessarily required for the final land use;

(B) Specific plans have been prepared which show the feasibility of the proposed land use as related to needs, projected land-use trends and markets, and that include a schedule showing how the proposed use will be developed and achieved within a reasonable time after mining and be sustained. The commission may require appropriate demonstrations to show that the planned procedures are feasible, reasonable and integrated with mining and reclamation and that the plans will result in successful reclamation;

(C) Provision of any necessary public facilities is assured as evidenced by letters of commitment from parties other than the operator, as appropriate to provide them in a manner compatible with the operator's plans;

(D) Specific and feasible plans for financing attainment and maintenance of the postmining land use including letters of commitment from parties other than the operator as appropriate, if the postmining land use is to be developed by those parties;

(E) The plans are designed under the general supervision of a registered professional engineer, or other appropriate professional, who will ensure that the plans conform to applicable accepted standards for adequate land stability, drainage and vegetative cover and aesthetic design appropriate for the postmining use of the site;

(F) The proposed use(s) will neither present actual or probable hazard to public health or safety nor will they pose any actual or probable threat of water flow diminution or pollution;

(G) The use(s) will not involve unreasonable delays in reclamation;

(H) Measures to prevent or mitigate adverse effects on fish and wildlife that have been approved by appropriate state and federal fish and wildlife management agencies;

(I) Proposals to change premining land uses of range, fish and wildlife habitat, forest land, hayland and pasture to a postmining cropland use, where the cropland would require continuous maintenance such as seeding, plowing, cultivation, fertilization or other similar practices to be practicable or to comply with applicable federal, state and local laws, shall assure that—

1. There is a firm written commitment by the operator or by the owner or land manager to provide sufficient crop management after release of applicable performance bonds to assure that the proposed postmining cropland use remains practical and reasonable;

2. There is sufficient water available and committed to maintain crop production; and

3. Topsoil quality and depth are shown to be sufficient to support the proposed use; and

(J) The proposed alternative postmining land use, prior to formal permit filing, shall be submitted to the director at least sixty (60) days prior to formal permit filing and the director shall provide public notice of the proposed alternative postmining land use of not less than forty-five (45) days nor more than sixty (60) days for interested citizens and local, state and federal agencies to review and comment on the proposed land use.

*Auth: section 444.535.1(2), RSMo (1986). *Original rule filed July 13, 1978, effective Jan. 13, 1979.*

**Original authority 1978, amended 1988.*

10 CSR 40-2.040 Backfilling and Grading Requirements

PURPOSE: This rule complies with section 444.535.1(3), RSMo by setting forth the requirements for backfilling and grading in order to restore the approximate original contour of the land.

(1) General. In order to achieve the approximate original contour, the operator, except as provided in this rule, shall transport, backfill, compact (where advisable to ensure stability or to prevent leaching of toxic materials) and grade all spoil material to eliminate all highwalls, spoil piles and depressions.