

## Chapter 24.18

### MINE HAZARD AREA

#### Sections:

- 24.18.010 Mine hazard area – General purposes.**
- 24.18.020 Mine hazard area – Applicability – Permitted uses.**
- 24.18.030 Mine hazard area – Maps.**
- 24.18.040 Mine hazard area – Development standards and review.**
- 24.18.050 Mine hazard area – Standards for mine hazards studies.**

#### **24.18.010 Mine hazard area – General purposes.**

The purposes of this chapter are to:

- A. Protect public health and safety given current information on mine hazards;
- B. Minimize damage to property due to mine hazards; and
- C. Identify approximate locations of mine hazard areas.

#### **24.18.020 Mine hazard area – Applicability – Permitted uses.**

- A. Mine hazard areas in Thurston County are generally limited to coal mines in south central Thurston County.
- B. This chapter applies to areas in Thurston County that may be designated as a mine hazard area as defined in Chapter 24.03 TCC, which include those areas within 100 horizontal feet of a mine opening at the surface or which are underlain at a depth of 300 feet or less by mine workings.
- C. Permitted uses in mine hazard areas shall be the same as the underlying zoning district except that critical facilities listed in Table 24.15-2 shall not be permitted.

#### **24.18.030 Mine hazard area - Maps.**

Mine workings are identified in the Washington State Department of Natural Resources, Division of Geology and Earth Resources, Open File Report 94-7 “The Washington State Coal Mine Map Collection: A Catalog, Index, and User’s Guide,” Open File Report 84-6 “Inventory of Abandoned Coal Mines in the State of Washington,” and specific maps and surveys of mine workings on file with the Department of Natural Resources. General areas of coal mines have been delineated on maps provided by the Washington State Department of Natural Resources. These maps relied on annual reports submitted by mining companies since about 1900. Mines abandoned prior to 1900, and some small and unregistered mines are not documented in filed reports. Maps note broad areas suspected of posing coal-mine hazards and may not show individual mines. Because the lack of a full historic record for coal mines leaves uncertainties on the location of all coal mine hazards, Thurston County cannot guarantee that all coal mine hazard areas are noted on maps. This chapter is not a guarantee against damage or injury due to coal mine hazards.

**24.18.040 Mine hazard area – Development standards and review.**

- A. Development on or near a mine hazard area requires the applicant to first demonstrate that no hazards to health or safety exist at the proposed site.
- B. Development within mine hazard areas shall be accompanied by technical studies by qualified professionals that assess the potential risk from mine entries, shafts and ventilation facilities; investigate potential future trough subsidence or sinkhole development due to collapse of abandoned coal mines; and identify specific measures to mitigate the risk in accordance with the criteria below:
1. Mine entries and shafts shall be permanently sealed using controlled backfill and/or grouting, or an approved, engineered seal and shall include permanent diversion of surface drainage away from the shaft or mine entry; and
  2. Existing sinkholes and shallow prospect excavations shall be backfilled to surface using controlled placement of suitable backfill and shall include permanent diversion of surface drainage away from existing sinkholes and prospect excavations; and
  3. Potential sinkhole hazards shall be assessed by a qualified professional utilizing direct subsurface investigations that demonstrate coal mine workings either do not exist, or that the workings have fully collapsed so that there is no remaining potential for sinkhole development, or show that the hazards associated with any voids that are identified are fully mitigated by backfilling, grouting, or other approved means such that the potential for sinkhole development is eliminated; and
  4. Any coal mine waste dump shall be demonstrated to be stable through analysis by a qualified professional. If the coal mine waste dump does not meet the stability criteria, it shall be regraded or otherwise mitigated to meet stability criteria. If springs or seeps discharge from the coal mine waste dump, materials shall be removed or be covered with a minimum of two feet of clean soil and be revegetated with native vegetation. Development shall not be permitted within 100 feet of any coal mine waste dump that shows evidence of current or past combustion. Development may be permitted over coal mine waste material only if an investigation and analysis by a qualified professional identifies feasible construction criteria for foundation stability and performance; and
  5. Mine gas hazards shall be mitigated by backfilling all mine entries, shafts and sinkholes and providing appropriate venting; and
  6. Mine fire potential shall be assessed through analysis by a qualified professional. Development shall not be permitted within 100 feet of mine workings where investigations indicate the possibility of combustion or the possible presence of existing combustion in the underlying seam or seams.

- C. As a result of geotechnical investigations, the director may require special studies to ensure proposed buildings, utilities, and roads are constructed to adequate engineering specifications to address subsidence effects, strains, tilts and other issues associated with mine hazards areas.

**24.18.050 Mine hazard area – Standards for mine hazard studies.**

In addition to the geologic hazard assessment requirements in Chapter 24.35 TCC for special reports, the following are also required in mine hazard areas:

- A. A mine hazard assessment shall contain all available documentary information about mine workings and the results of a surface reconnaissance that shall identify any public safety mine hazards, mine waste dumps, or evidence of mine subsidence or sinkholes and shall include:
1. Historical mining data, including available copies of original mine records for mine workings; and
  2. A map showing property boundaries, mine hazard boundaries, and any potential hazards identified within 100 feet of the property.
- B. Shallow hazards such as entry portals, shaft collars, ventilation shafts, prospects, and mine waste dumps may be investigated by test pits or trenching, provided the method enables an investigation to an adequate depth for the hazard being investigated.
- C. Site-Specific Evaluation of Potential Trough Subsidence:
1. Review of available records of original mine workings that could potentially influence the site by trough subsidence shall include:
    - a. Locations, depths and thicknesses of such seams and workings; and
    - b. Mine workings that could potentially influence the site shall be determined by projecting the downdip limit angle from the lowest limit of the documented workings to the ground surface. Mine workings are considered to potentially influence the property if the property lies within the line at which the limit angle intersects the ground surface.
  2. Subsurface conditions may be evaluated by drilling. Drilling is the most acceptable method for providing information for reducing the remaining mine height value used in subsidence calculations to less than the height of the original workings. For these evaluations:
    - a. Drillholes shall be logged continuously from 100 feet above to 20 feet below mine working, including lithology at five-foot intervals, drill fluid circulation, penetration rate, and free fall of the drill string; and

- b. Greater confidence will be placed in core drilling logs than rotary drilling logs; and
  - c. As a guidelines, a minimum of one drillhole penetrating each seam that could potentially cause trough subsidence at the site should be drilled for each 200-foot length of the adit; and
  - d. Surface geophysics, or other indirect means, may be used to assist in projecting information between and beyond drillholes, but shall not be accepted as the sole method for evaluating the condition of underground mine workings and calculating remaining mine height.
3. Calculation of trough subsidence magnitudes, tilt and strains shall be in accordance with the empirical function method of the British National Coal Board, as presented in their Subsidence Engineers Handbook, adjusted to reflect the effects of inclined seams and downdip limit angles encountered, and shall be based on a conservative evaluation of site conditions developed from the review of available records, site investigation, and subsurface exploration. Calculations shall consider the following:
  - a. Calculations shall calculate the subsidence factor, and the downdip limit angle with direct field evidence or a review of detailed mine records; and
  - b. Remaining mine height shall be presumed to be equal to the seam thickness for the subsidence calculations unless evidence from drilling justifies modification; and
  - c. The calculation of potential tilts and strains shall consider effects of individual panel widths and barrier pillar widths. If direct subsurface investigation indicates that the mine workings are fully collapsed, an estimate of potential surface settlements due to consolidation of rubble and loose material shall be made for the cumulative effect of all seams that could induce trough subsidence at the site.
4. Site plans shall be prepared showing the proposed development and calculated magnitudes of potential subsidence, strains, and tilts at the property boundaries and at the location of any proposed structures. This also includes the following:
  - a. A map showing contours of potential subsidence magnitudes, strains, and tilts throughout the property shall be submitted for use in design of roads and utilities; and
  - b. Appropriate recommendations shall be provided for structural and civil design requirements.

- D. Site-specific evaluation for potential sinkhole hazards:
1. Review of available records shall be as in subsection A (1) of this section.
  2. Subsurface conditions for workings located within 200 feet of the ground surface shall be investigated by drilling. For this investigation:
    - a. Drillhole sites shall be selected at representative locations and at representative working depths. A minimum of five drillholes shall be drilled along the alignment of any linear structure, such as proposed roads or utility lines designed to cross a mine hazard area. No fewer than one drillhole per acre shall be provided for a site.
    - b. Core drilling is preferred, but is not compulsory. Rotary drilling is an acceptable method, provided it is used in combination with downhole geophysical logging, including caliper logs. Drilling shall penetrate immediately above and through the predicted mine workings locations to facilitate interpretation of the conditions of the mine workings.
    - c. Drillholes shall be logged continuously throughout their length, including lithology at five-foot intervals for rotary drillholes, drill fluid circulation, penetration rate, and free fall of the drill string.
- E. The director may waive or reduce engineering study and design requirements for alterations in mine hazard areas for the following:
1. Additions or alterations to legally existing structures meeting the requirements in place at the time of construction that do not increase occupancy or significantly affect the risk of structural damage or injury; and
  2. Buildings that are defined as agricultural buildings in 14.46.010 TCC.