

**6132.2400 STORAGE PILE DESIGN.**

Subpart 1. **Goals.** Storage piles must be designed and constructed to minimize hydrologic impacts, enhance the survival and propagation of vegetation, be structurally sound, control erosion, promote progressive reclamation, and recognize the conservation of the mineral resources.

Subp. 2. **Requirements.** Storage piles must meet the requirements in items A to D.

A. General design: All storage piles shall be designed and constructed according to the standards in subitems (1) to (4).

(1) When mine waste is deposited on areas with unstable foundations such as peat, muskeg, bedded lacustrine deposits, karst topography, active seismic and flood zones, and areas above or within a mine, a professional engineer, registered in this state and proficient in the design, construction, operation, and reclamation of facilities on unstable foundations, shall examine the foundation and design the storage piles to ensure stability.

(2) Practices such as the use of vegetated buffer strips, hay bale dikes, silt fences, or settling basins shall be used to control erosion.

(3) Rills or gullies shall be observed to determine dominant runoff flow paths, which shall be stabilized to control runoff.

(4) Storage piles containing reactive mine waste must also comply with the requirements of part 6132.2200.

B. Rock storage piles: The final exterior slopes of lean ore, waste rock, and leached ore storage piles shall consist of benches and lifts as follows:

(1) no lift shall exceed 40 feet in height;

(2) no bench shall be less than 30 feet, measured from the crest of the lower lift to the toe of the next lift;

(3) the sloped area between benches shall be no steeper than the angle of repose; and

(4) when vegetation is required under part 6132.2700, subpart 2, item A, subitem (13), the sloped areas between benches shall be prepared to support vegetation.

C. Surface overburden: Surface overburden shall be disposed of according to subitems (1) and (2).

(1) When surface overburden is generated, it shall be placed in layers on the completed tops and benches of lean ore and waste rock storage piles to enhance reclamation potential.

(2) If no completed tops or benches are available, or if such sites are not within economic haul distances of surface stripping activities, surface overburden storage piles shall be created so that the final exterior slopes shall consist of benches and lifts as follows:

- (a) no lift shall exceed 40 feet in height;
- (b) no bench width shall be less than 30 feet wide, measured from the crest of the lower lift to the toe of the next lift;
- (c) the sloped area between benches shall be no steeper than 2.5:1; and
- (d) runoff water shall either be temporarily stored on benches or removed by drainage control structures.

D. Mixed storage piles: Lean ore and waste rock shall not be used to cover surface overburden storage piles to avoid compliance with sloping and vegetation requirements. This shall not preclude the abutting of lean ore or waste rock storage piles with surface overburden storage piles or the placement of lean ore or waste rock lifts on top of surface overburden pads or lifts.

E. Alternative design: Based on acceptable research, the commissioner shall approve other measures that satisfy subpart 1.

**Statutory Authority:** *MS s 93.44 to 93.51; 103G.222*

**History:** *17 SR 2207*

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