Policy Memorandum No. 5 to Mine Operators

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TO: All Mine Operators and Lignite Energy Council

FROM: Commissioners Wefald, Hagen and Reinbold

SUBJECT: Suitable Plant Growth Material Removal

The purpose of this memorandum is to let the mine operators know what the Public Service Commission (PSC) inspectors are looking for when approving topsoil and subsoil removal and segregation.

When removing topsoil materials, only the dark-colored topsoil materials should be saved. As a general practice, first lift removal should cease when the lighter-colored subsoil materials start to become **representatively evident** across an area. This may mean leaving a thin, irregular layer (no more than 2-3 inches) of the darker-colored materials in some areas as the lighter-colored materials are first encountered. During an inspection a PSC inspector will be reviewing the degree to which an operator has representatively exposed the subsoil materials across a given area and the overall accuracy of the topsoil removal process. Quite often the change from the dark-colored topsoil materials to the lighter-colored subsoil material will be gradual. However, it should be pointed out that the abruptness of the color change will vary with different soil types. Efforts must be taken to **prevent the mixing** of topsoil materials with subsoil materials since research by the Northern Great Plains Research Center has shown the mixing of these materials has resulted in lower productivity levels when compared to topsoil materials that have not been mixed with other materials. In addition, operators need to avoid placing calcareous soil material at the surface in the reclamation process since it may result in the creation of Highly Erodible Land (HEL) as defined under the federal farm program.

Two exceptions to the procedure to removing topsoil materials to the color change are when sandier-textured soil materials (fine sandy loams, sandy loams, loamy fine sands) or when sodium affected (sodic) soils are present. One of the mapping criteria for topsoil is that the materials have an organic matter content of at least 1 percent. The sandier-textured soil materials are usually dark-colored to a depth considerably greater than the thickness of topsoil materials mapped. For this reason, the thickness of topsoil material removed from areas with sandier-textured soil materials should not be any greater than that specified by the soil survey. If all of the dark-colored materials from these areas were saved as first lift, the organic matter

content would be somewhat less than 1 percent, thus reducing the quality of the top-dressing materials.

Sodium affected (sodic) soils also tend to be dark colored to a depth considerably greater than the thickness indicated for topsoil removal. The B horizon of sodic soils consists of dispersed clay and organic matter giving the B horizon a dark color; however, this material generally does not meet the requirements for topsoil due to the elevated sodium adsorption ratio (SAR). Mixing of this sodic B horizon material will degrade the physical characteristics of the topsoil it is mixed with. The thickness of topsoil material removed from sodic soils should not be any greater than that specified by the soil survey.

If the total soil respread thicknesses for disturbed areas will be based on the graded spoil characteristics as specified in NDAC 69-05.2-15-04(4)(a)(2), the total amount of soil removed (topsoil plus subsoil) must be sufficient to meet these requirements. However, if disturbed areas will be respread according to NDAC 69-05.2-15-04(4)(a)(1), the amount of soil removed should be the total thickness (thickness of topsoil and subsoil added together) indicated by the soil survey.

Exceptions to the above procedures may be granted on a case-by-case basis depending on the conditions involved. They may require sampling the questionable materials by the operator for laboratory analysis.

The removal of frozen soil materials is not prohibited; however, the operator must take special precautions to remove the frozen soil materials properly. These precautions should include more supervision and informing all equipment operators of the soil removal requirements when frozen soil materials are ripped and removed. Steps have to be taken to ensure there is no mixing of the topsoil and subsoil materials and that when the depth of subsoil is limited, that only the suitable materials are removed and saved.

Bruce Hagen	Susan E. Wefald	Leo M. Reinbold
Commissioner	President	Commissioner

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