



Designation: D8215 – 19a

Standard Practice for Statistical Modeling of Uncertainty in Assessment of In- place Coal Resources¹

This standard is issued under the fixed designation D8215; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

Assessment of coal tonnage in-place is a fundamental factor in evaluating the commercial feasibility of any deposit. Equally important is an appraisal of the reliability that can be placed in the drilling data available for an estimation. Traditional methods for quantitatively expressing uncertainty use reliability categories based simply on the distance between drill-hole data within the boundaries of a coal bed. A significant limitation of the distance approach is the inability to express uncertainty in terms of how close a resource estimate is to the true value.

This practice provides a geostatistical methodology to calculate the uncertainty of an in-place, coal resource estimate, both at the deposit and block level. In addition to examining the drilling pattern both within and outside the coal bed, other factors influencing the complexity in the geology are also considered, resulting in realistic estimates of uncertainty. Most importantly, the uncertainty is expressed directly in tons of coal. Like other coal properties, uncertainty can be used to rank the resources in classes.

1. Scope*

1.1 This practice covers a procedure for quantitatively determining in-place tonnage uncertainty in a coal resource assessment. The practice uses a database on coal occurrence and applies geostatistical methods to model the uncertainty associated with a tonnage estimated for one or more coal seams. The practice includes instruction for the preparation of results in graphical form.

1.2 This document does not include a detailed presentation of the basic theory behind the formulation of the standard, which can be found in numerous publications, with a selection being given in the references (1-3).²

1.3 This practice should be used in conjunction with professional judgment of the many unique aspects of a coal deposit.

1.4 *Units*—The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

¹ This practice is under the jurisdiction of ASTM Committee D05 on Coal and Coke and is the direct responsibility of Subcommittee D05.07 on Physical Characteristics of Coal.

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² The boldface numbers in parentheses refer to the list of references at the end of this standard.

NOTE 1—All values given in parentheses after SI units are stated in inch-pound units.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*³

D621 Test Methods for Deformation of Plastics Under Load (Withdrawn 1994)⁴

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D5549 Guide for Contents of Geostatistical Site Investigation Report

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard