SORPTIVE MINERALS INSTITUTE

APPENDIX E

MSHA-2023-001

AB36-Comm-145-6 Appendix E -Geology and Map Sorptive Minerals

5.0 GEOLOGY – OCCURRENCE AND MINERALOGY

The materials used in pet litter in the United States are obtained from only a few clay deposits. All of these deposits are sedimentary in origin and range from 1.6 million to 110 million years of age. None of these materials has been exposed to temperatures higher than 150°C, either during formation or after deposition. The total quartz content of the clays mined from these deposits ranges from non-detectable to approximately 9%. Principal among these deposits are:

- The Monterey formation of California
- The diatomite deposits of central Oregon
- The Porters Creek formation of the Mississippi valley
- The Twiggs fullers earth of the southeastern United States
- The Meigs fullers earth of the southeastern United States
- The Wyoming-type sodium bentonite deposits
- The calcium bentonite deposits of north central Florida
- The fullers earth deposits of eastern Virginia

A complete description of the geology and mineralogy of these deposits, along with a map showing their locations (Figure 3) and a geologic time chart (Figure 4) may be found in Reference Section 2.

6.0 REGULATION AND COMPLIANCE

6.1 REGULATION OF QUARTZ DUST

Despite a large amount of scientific research over many years, quartz and other natural silica phases remain an enigma, especially with respect to their bioactivity. This fact was affirmed recently when IARC determined that quartz is not always carcinogenic[23]. It has only been during the past few decades that research has shown the positive link between quartz particles inhaled immediately after fracturing and acute lung damage. In contrast, the United States Environmental Protection Agency (EPA), in a recent comprehensive study of ambient dusts, has shown the exposure to dusts containing crystalline silica from farming and wind blown dusts is not a problem[27].

Despite these recent findings, regulations continue to be based upon research that employed pure, single crystal, recently fractured grains of quartz of high-temperature origin. This practice has had the effect of erroneously indicting all quartz particles, including polycrystalline chert and grains whose surfaces are occluded by aluminosilicate minerals and/or opaline silica, such as clay or non-crystalline silica, as being biologically aggressive.

6.2 METHODS OF DETERMINING COMPLIANCE

Monitoring the air for respirable quartz particles and determining their concentration provides the principal method for regulating health hazards associated with the inhalation of quartz dust.

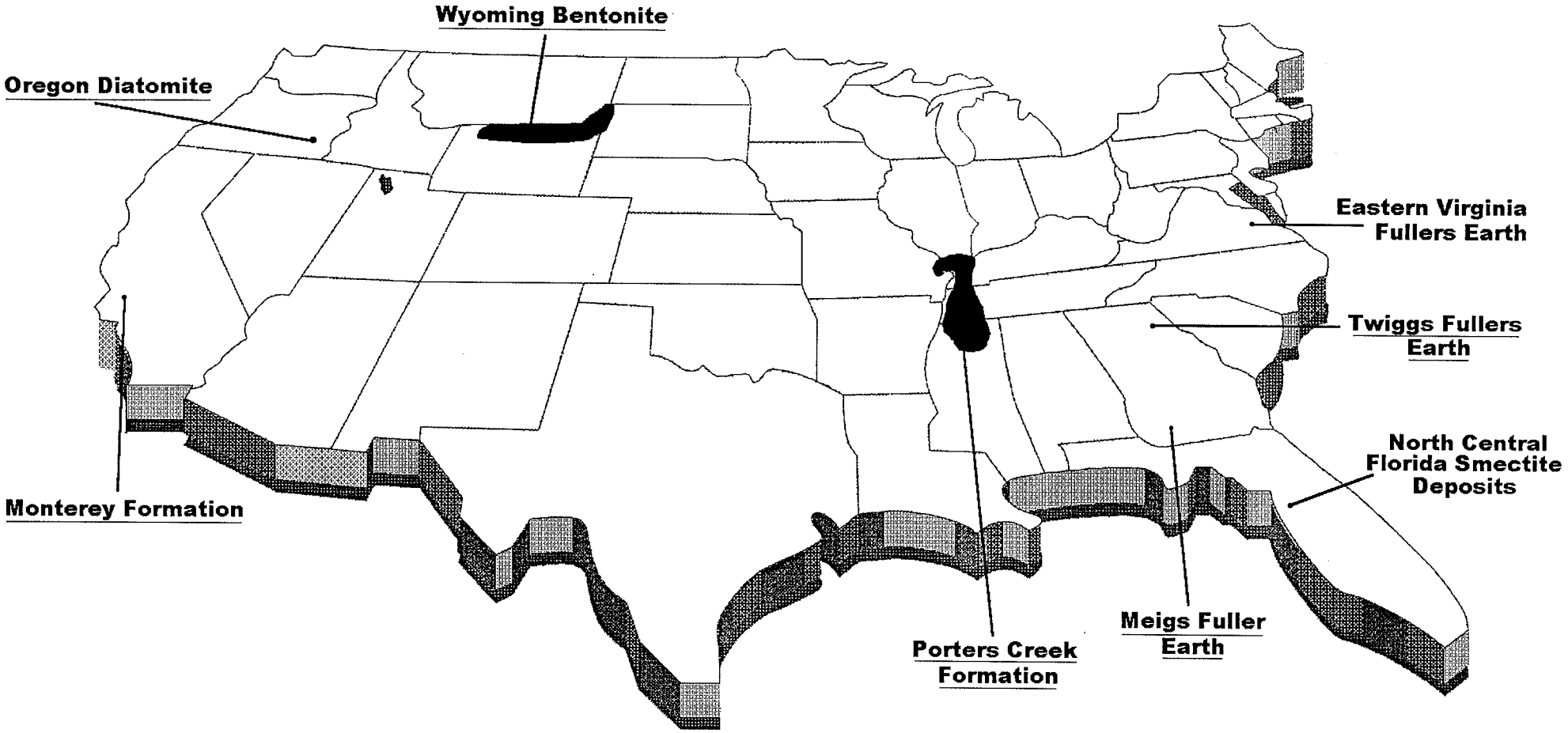

Figure 3. – Map of Members' Geological Deposits for Pet Litter.