VOLCANIC ASH

Volcanic Ash:
Volcanic ash consists of rock, mineral, and volcanic glass fragments smaller than 2 millimeters (mm) (smaller than 0.1 inch) in diameter, which is slightly larger than the size of a pinhead. Volcanic ash is not the same as the soft fluffy ash that results from burning wood, leaves, or paper. It is hard, does not dissolve in water, and can be extremely small -- ash particles less than 0.025 mm (1/1,000th of an inch) in diameter are common. Ash is extremely abrasive, similar to finely crushed window glass, mildly corrosive, and electrically conductive, especially when wet.

Volcanic Hazard:
Volcanic ash is highly disruptive to economic activity because it covers just about everything, infiltrates most openings, and is highly abrasive. Airborne ash can obscure sunlight to cause temporary darkness and reduce visibility to zero. Ash is slippery, especially when wet; roads, highways, and airport runways may become impassable. Automobile and jet engines may stall from ash-clogged air filters and moving parts can be damaged from abrasion, including bearings, brakes, and transmissions.

Created During Explosive Eruptions:
Volcanic ash is created during explosive eruptions by the shattering of solid rocks and violent separation of magma (molten rock) into tiny pieces. Explosive eruptions are generated when ground water is heated by magma and abruptly converted to steam and also when magma reaches the surface so that volcanic gases dissolved in the molten rock expand and escape (explode) into the air extremely rapidly. After being blasted into the air by expanding steam and other volcanic gases, the hot ash and gas rise quickly to form a towering eruption column directly above the volcano.

Bentonite:
Bentonite is a type of clay formed from altered volcanic ash. Most types of bentonite swell when they absorb water.

Volcanic Ash Deposits:
Ash deposits from Yellowtone's powerful eruptions have been mapped as far away as Iowa, Missouri, Texas, and even northern Mexico. White ash erupted from the Teton region accumulated on the sinking floor of Jackson Hole 9 million to 10 million years ago, leaving deposits nearly one mile thick. A thick ash deposit from eruptions in the Rocky Mountains is sandwiched between layers of sandstone in Nebraska. About 760,000 years ago a cataclysmic volcanic eruption in the Long Valley, California, area blew out 150 cubic miles of magma from a depth of about 4 miles beneath the Earth's surface. Rapidly moving flows of glowing hot ash covered much of east-central California, and airborne ash fell as far east as Nebraska. The caldera now filled by Oregon's Crater Lake was produced by an eruption that destroyed a

volcano the size of Mount St. Helens and sent volcanic ash as far east as Nebraska. A series of ash beds, collectively called the Tioga Bentonite, are present in Middle Devonian rocks throughout much of the Appalachian Basin and into the Illinois and Michigan Basins. The Tioga volcanism is thought to have originated from a source in eastern Virginia.

Tephra:
Tephra is a general term for fragments of volcanic rock and lava regardless of size that are blasted into the air by explosions or carried upward by hot gases in eruption columns or lava fountains. Such fragments range in size from less than 2 mm (ash) to more than 1 meter (m) in diameter. Large-sized tephra typically falls back to the ground on or close to the volcano and progressively smaller fragments are carried away from the vent by wind. Volcanic ash, the smallest tephra fragments, can travel hundreds to thousands of kilometers downwind from a volcano.

See also **Tephra**

-- Excerpts from:
USGS Volcano Hazards Program Photoglossary, 2003, U.S. National Park Service Websites, 2003, Kious and Tilling, 1996, This Dynamic Earth: The Story of Plate Tectonics: USGS Special Interest Publication, Ohio State Geological Survey Website, 2001

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