# GLOSSARY OF TERMS

**Cementitious Grout.** Grout mixtures which contain cement and water, with or without aggregate, proportioned to produce a pourable consistency without segregation of the constituents; also a mixture of other composition, but of similar consistency.

**Chemical Grouts.** Chemical grouts consist of many non-cement mixtures, including sodium silicate, acrylate, lignin, urethane, and resin.

**Epoxy Resins (EP).** Multi-component liquid chemical converted to a solid when mixed with a curing agent. Resultant material is characterized by significant tensile, compressive and bond strengths. Epoxies are resins that, in the uncured form, contain one or more reactive epoxide or oxirane groups. These epoxide groups serve as cross-linking points in the subsequent curing step, in which the uncured epoxy is reacted with a curing agent or hardener. Cross-linking is accomplished through the epoxide groups, as well as through hydroxyl groups that may be present. Most conventional unmodified epoxy resins are produced from epichlorohydrin (chloropropylene oxide) and bisphenol A. The other types of epoxy resins are phenoxy resins, novolac resins, and cycloaliphatic resins. Typical epoxy resins are two-component mix systems and can be formulated with low to high viscosities.

**Grout.** A substance that has sufficient fluidity to be injected or pumped into a porous body or into cracks, and is intended to harden in place (see “Cementitious Grout”, “Chemical Grout”).

**Grouting.** A process of injecting, filling, and/or displacing a volume with grout.

**Ground Improvement/Stabilization.** Any method used to increase the shear strength properties of subsurface materials.

**Hydrophobic.** A material that repels or displaces water.

**Hydrophilic.** A material that can interact with and absorb water.

**Hydrophilic Gels.** Moisture sensitive polyurethanes that may shrink or crack if subjected to a dry environment. Not applicable to situations when subsurface or injected area may completely dry out. Typically material is low in viscosity and penetrates most soils.

**Injection Ports.** Injection ports can consist of a surface port which is placed or driven into a hole (for low pressure injection) or a mechanical packer (for high pressure injection).

**Polymer.** A chemical mix created by reacting two or more monomers. The resultant large-molecule substances include epoxy, polyester, nylon, acrylic, polyurethane, and others.

**Polymer Grout.** A solution injected into a porous body or a crack that reacts in place to form a gel, foam or solid. Examples include mixtures of polyurethanes and epoxy resins.

**Polyurethane (PU).** Polyurethanes are extremely versatile plastics in terms of the forms in which they are available: flexible or rigid foams, solid elastomers (or rubbers), coatings, adhesives and sealants. Their versatility also extends to chemical structure in that, although the urethanes are generally considered thermosets, there are grades of urethane elastomers that are thermoplastic in nature and are supplied in pellet form for molding, calendering and extrusion. Like all urethanes, the foams are prepared by first reacting two liquid components - polyols and isocyanates. In the form of elastomers, polyurethanes offer abrasion resistance and toughness. The commonly used isocyanates for manufacturing polyurethanes are toluene diisocyanate, methylene diphenyl isocyanate, and polymeric isocyanates, obtained by the phosgenation of polyamines derived from the condensation of aniline with formaldehyde. Polyols (with hydroxyl groups) are macroglycols, which are either polyester or polyether based. Polyurethane elastomers and resins take the form of liquid castings systems, thermoplastic elastomers and resins, microcellular products, and millible gums.

**Polyurethane Resin (PUR).** In a review of the recent literature, it is sometimes difficult to distinguish polyurethane (PU) products from polyurethane resin (PUR) products. Typically, PU products can be injected as either a one-stage or two-stage component mixing process and may or may not have a resin component. PUR products are typically considered a two-stage component mixing process and generally have a resin component. In general, PUR is considered a higher strength injection grout used for rock stabilization. PU single stage grouts are generally lower in strength and are considered more as a water sealant (especially for hydrophilic type grouts) than a stabilization product.

**Resin.** Any of a class of amorphous solids or semi-solids. Although generally a naturally occurring substance, PUR is a manufactured product.

**Rigid Cellular Plastics.** Typically these are plastic foams, but some literature refers to PUR with this term as well.

**Sodium Silicate.** The most commonly used chemical grouts are sodium silicate based. Sodium silicates have been developed into a variety of different grout systems, and are based on reacting a silicate solution to form a gel that binds soil or sediment particles together and fills voids.

**Thixotropic.** Property of a material that is a gel at rest, becoming fluid when agitated.

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