

Soil Water Chemistry of Reforested Mine Site in West Virginia¹

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Abstract: Proper reclamation of surface coal mining sites is essential for adequate restoration of ecosystem services, such as clean water. In this study, we present results of soil water chemistry in reforested experimental site and discuss the underlying conditions and mechanisms governing the system. The effect of Forestry Reclamation Approach practices, namely the use of oxidized vs reduced sandstone spoils as topsoil replacement material, and loose vs compacted placement thereof are evaluated at ca.12 years reclaimed sites. Two large experimental plots (ca. 2.8 hectare each) established in 2005 using brown sandstone or gray sandstone spoils as topsoil replacement material. Each plot was further split into two subplots where the material was compacted or loosely placed. Shallow wells and zero-tension pan lysimeters (30 to 80 cm deep) installed near three random locations within each treatment plot (spoil type x placement practice) during early spring of 2017. Water samples were collected weekly during 2017 and 2018 growing seasons and analyzed for elemental and ionic composition, total alkalinity, total and organic and inorganic carbon, as well as dissolve oxygen, pH, temperature, and redox potential. Results of the two years are discussed and compared to on-site surface runoff water composition and to that of soil water in adjacent, non-disturbed forest.³

Additional Key Words: redox potential, spoil, brown sandstone, Forestry Reclamation Approach.

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 3. Work reported here was conducted near 38° 02' 42" N; 81° 30' 30" W.