UTILIZING MINE WATER FOR AQUACULTURE - AN OVERVIEW OF PRODUCTION FORMATS, 2003[1]

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Abstract. Treated and untreated water originating from coal mines in Appalachia has been utilized to produce harvestable size salmonids for the past decade. Abundant sources of well oxygenated water with a pH between 6.5 and 8.5, and stable water temperatures between 40 and 70 F are required. Stability of water temperature between 55 and 60 F year round allows the grower to feed all year long, something not possible in surface waters. Suitable infrastructure (seed stock, feed, processing plant, market demand) exists to support continued growth of this industry. Rainbow Trout are the predominant species cultured, but brown trout, and arctic char are also grown. It has been estimated that nearly 4 million pounds can be produced if 30 % of available mine water is utilized for this purpose. This presentation will describe the production system at five locations utilizing treated and untreated mine water and the potential use of a retired Acid Mine Discharge (AMD) treatment plant as a marketing tool for farm raised fish.

Acid mine water, found in the northern part of West Virginia (WV), is usually treated with aeration, lime, and flocculants, before passing through a polishing pond. Infrastructure created in this process effectively reduces the investment costs for salmonid production. Net pens have been used successfully by the Maryland Department of Natural Resources at the Mettiki AMD treatment plant near Oakland, Maryland for the past decade. West Virginia University installed a modular composite raceway near Morgantown, WV for research. It utilizes effluent from the polishing pond at Consol Energy's Dogwood AMD treatment plant.

In southern WV, groundwater flowing from coal mines does not require treatment to remove metals and acidity. Two production facilities which rely on gravity flow of aerated mine water to grow food size rainbow trout have been operating near Sophia, WV for about 6 years. High Appalachia, Inc. grows about 200,000 lb of rainbow trout at these facilities for its processing plant near Sophia, WV. West Virginia Aqua, Inc. has two facilities devoted to the production of Arctic Char in southwestern West Virginia which began marketing product in 2002. The capacity of their production facility is estimated to be 500,000 lb and features a design that recirculates mine water with approximately 80% reuse.

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