

## FOREWORD

Under an agreement with the Federal Water Pollution Control Administration, five areas within the Susquehanna River Basin were studied in 1967 by Gannett Fleming Corrdry and Carpenter, Inc. , (GFC&C). The purposes of this study were to determine the causes and extent of mine drainage and to establish abatement plans (with associated costs) that would be capable of meeting all of the mine drainage discharge limitations established by the Pennsylvania Sanitary Water Board. The findings, conclusions, and recommendations of this study were presented in a 1968 report entitled "Acid Mine Drainage Abatement Measures For Selected Areas Within The Susquehanna River Basin referred to herein as the FWPCA Report.

One of the five areas studied included a portion of the Pennsylvania Bituminous Coal Field in southeastern Tioga County in the upper reaches of the Tioga River. This area, which is designated as the Morris Run Study Area, is drained by three tributaries of the Tioga River, namely, Morris Run, Coal Creek, and Bear Creek. Although coal has been mined in other areas of the Tioga River watershed, the

Morris Run Study Area is virtually the sole source of acid mine drainage pollution of the Tioga River. The abatement plan recommended for construction proposed the elimination or treatment of all AMD discharges. Following submission of the FWPCA Report in May of 1971, the PA Department of Environmental Resources submitted a demonstration grant to contract preventative measures comprising the recommended abatement plan. The primary purpose of the demonstration project was to show the effectiveness of certain construction techniques in the abatement of AMD. Other objectives proposed for achievement under the grant included the initial effort to abate AMD pollution in the Tioga River watershed and the collection of water quality data on the affected streams as required for a closer evaluation of the need for further AMD abatement measures to attain desired water quality in the Tioga River. Any AMD abatement work in the Tioga River watershed will benefit the flood control project proposed by the US Corps of Engineers for construction on the Tioga River near Tioga, PA. This project, known as the Tioga-Hammond Lake, is being designed to provide a combination of two reservoirs in adjacent valleys connected

by a channel. One reservoir (Tioga Lake) will impound the Tioga River, which is currently acid at the site of the proposed reservoir under low flow conditions due to AMD pollution. The second reservoir (Hammond Lake) will impound Crooked Creek, which is alkaline under all flow conditions. A control structure in the proposed connecting channel will regulate the flow between the two impoundments in order to minimize adverse AMD effects on Hammond Lake and on the Tioga River downstream from the impoundments.

In a 1971 report entitled "Investigative Survey -- Occurrence And Effects Of Mine Drainage In The Tioga River Watershed", the Corps concluded that Tioga Lake could be maintained in an alkaline condition under all flow conditions in the Tioga River \*by the implementation of AMD abatement measures which would supplement the preventive measures proposed for construction under the demonstration project. The Corps estimated that such a program would eliminate the need to provide the control structure in the connecting channel between the Hammond and Tioga Lakes, and would result in cost savings estimated at nearly \$1.6 million. Furthermore, alkaline water more consistently entering Tioga Lake would enhance the recreational usage of the lake and provide a greater potential public use of the river above and below the impoundment as the result of better water quality.

At a meeting held on December 4, 1970, between the Department of Environmental Resources and the Corps, it was agreed that an engineering study was required to determine the extent of abatement measures necessary to meet the Corps' objective of maintaining an alkaline pool in the Tioga-Hammond Lake under the stipulated flow conditions. Accordingly, on September 22, 1971, an agreement was entered into between the Department and GFC &C under which GFC &C was authorized to: (1) study the various acid load reductions from point sources on Morris Run, Coal Creek, and Bear Creek that will be required to achieve alkalinity in the Tioga Lake at low flow and high flow conditions using information supplied by the Corps; (2) present ways to achieve objectives by providing additional AMD abatement projects supplementing the proposed AMD abatement projects recommended under the EPA demonstration project; (3) develop cost estimates of construction to achieve these goals; (4) assess land and mineral rights problems associated with the recommended construction; and (5) recommend priorities of construction.

The findings, conclusions, and recommendations resulting from this study are presented in this report.