

## REPORT ABSTRACT

### INTRODUCTION

This report culminates a 12 month investigation of mine drainage pollution in the Newport Creek Watershed, Luzerne County. The study was conducted for the Pennsylvania Department of Environmental Resources under the authority of the "Land and Water Conservation and Reclamation Act (Act 443).

The principal objectives of this study were to: locate and monitor all mine drainage discharges and their affects on stream water quality; locate surface water losses to underground coal mines; describe the origin and cause of acid mine drainage formation; and offer abatement recommendations to eliminate or reduce acid mine drainage pollution in the Newport Creek Watershed. Data used to evaluate the watershed was obtained from: available literature and personal contacts; field reconnaissance and detailed exploration; and water monitoring and sampling.

### THE STUDY AREA

The 15 square mile Newport Creek Watershed.' lies within. the Appalachian Mountain Section of the Valley and Ridge Province and is characterized by intense folding and faulting. Rock units present in the study area represent the Llewellyn and Pottsville Formation of the Pennsylvanian System and the Mauch Chunk and Pocono Formations of the Mississippian System. Pleistocene age

glaciofluvial deposits cover portions of the land surface.

The Llewellyn Formation contains at least twelve persistent anthracite coal seams. Thus, extensive strip and deep coal mining has been conducted throughout the watershed. This mining produced the present pitted topography which results in large infiltration losses of the total annual 39 inches of precipitation.

### THE STUDY

The study was initiated by collecting existing data and performing preliminary field reconnaissance to locate pollution sources and establish water sampling stations. Detailed field exploration was conducted to gather pertinent information for mapping and developing abatement projects.

Deep mine pumps located at sample stations F2 and N5 discharged approximately 67,000 lbs/day acid to the North Branch Newport Creek during the first ten months of this study. Following cessation of mine pumping in April, 1974, only 4,800 lbs/day acid were discharged at the mouth of Newport Creek (sample station N1). The Susquehanna #7 deep mine gravity discharge contributed over 3,000 lbs/day acid during the final two sampling rounds.

A hydrologic balance was performed using sampling and climatological data collected for the initial ten months of the study. Approximately 40% of the total precipitation was lost to deep mines via infiltration. It can be assumed that these infiltrating waters will obtain pollution similar to the pollutant concentrations recorded for mine pump discharges.

## THE ABATEMENT PLAN

The general abatement plan is to eliminate or reduce infiltration losses to abandoned deep mines and therefore, prevent pollution of fresh surface waters. The effectiveness of individual abatement projects was determined by computing acid loadings from measured flows or calculated infiltration losses, and applying acid concentrations equal to the average concentrations recorded at sample stations F2 and N5.

Eleven abatement projects were developed for the Newport Creek Watershed. Project construction includes stream channel lining and relocation, regrading and revegetation of strip mines and refuse piles and channel excavation. Only five of the abatement projects are recommended for construction due to high cost-effectiveness ratios and present or future coal mining plans.

## ACTIVE MINING

Most mining operations in the watershed have been curtailed. The only active deep mining is a small operation extracting coal from above the Wanamie #18 mine pool level. At the completion of this report, strip mining was limited to one operation extracting coal and another mine reclamation operation.

## CONCLUSIONS AND RECOMMENDATIONS

Infiltration losses to abandoned deep mines are equal to 40% of the, total precipitation within the Newport Creek Watershed. Subsequent degra-

ination of these surface waters is the major source of mine drainage pollution in the study area.

Abatement Projects #1, #2, #3, #5 and #6 are recommended for construction. These projects will abate approximately 8,360 lbs/day acid for a cost of \$331,500. The 8, 360 lbs. /day is 10% of the total 82,600 lbs./day load anticipated from the watershed upon final inundation of now abandoned mines.