

# 1. INTRODUCTION

Streams across the West Branch Susquehanna River (WBSR) watershed, which encompasses about 7,000 square miles in central Pennsylvania, are still polluted from abandoned mine drainage (AMD) from old coal mines (Figure 1). Cleaning up these impaired waters will cost millions of dollars, but these expenditures will provide a tremendous boost to the largely rural local economy. This report describes and quantifies the local and statewide economic benefits stemming from remediation of the WBSR watershed.

## Green-collar Jobs

Among other economic benefits, remediating AMD in the WBSR watershed will create numerous green-collar jobs, in which local residents design, build, and maintain treatment systems.

Green-collar jobs are “well paid, career track jobs that contribute directly to preserving or enhancing environmental quality.”

“Green-collar jobs tend to be local because many involve work transforming and upgrading the immediate built and natural environment.”

“Green-collar jobs are in construction, manufacturing, installation, maintenance, agriculture, and many other sectors of the economy.”

“...[S]purring the creation of green-collar jobs... means building a sustainable economy, where environmental goals go hand in hand with social and economic goals.” (Apollo Alliance and Green For All, 2008, p. 2)

**Picture 1: The West Branch Susquehanna River**



Photo credit: Amy Wolfe.

The WBSR Task Force plays a leading role in working toward the remediation of the region's AMD. The Task Force is composed of state, federal, and regional agencies, Trout Unlimited (TU), and other conservation and watershed organizations. Soon after its inception in 2004, the Task Force published a state of the watershed report (WBSR Task Force, 2005). The Task Force has also played a key role in the recent AMD remediation strategy (SRBC, 2008) and has provided valuable data for this local economic benefit analysis.

### **Trout Unlimited's Role**

In 1998, TU—a national non-profit organization whose mission is to conserve, protect, and restore North America's trout and salmon fisheries and their watersheds—acknowledged the significance of AMD problems in the Kettle Creek watershed in Clinton County as a component of its nationally renowned Kettle Creek Home Rivers Initiative. In 2004, TU took its AMD remediation work to the next level and launched the West Branch Susquehanna Restoration Initiative, which is aimed at the restoration of coldwater streams and the ultimate recovery of the WBSR.

As the lead nonprofit organization for this initiative, TU is working with numerous local, state, and federal government and non-government partners on a coordinated, strategic, and cost-effective AMD cleanup approach for the entire river basin. TU is also providing organizational support to the West Branch Susquehanna Restoration Coalition, a group that represents the collective efforts of watershed groups, TU chapters, county conservation districts, businesses, and others that are working to address AMD problems throughout the WBSR watershed.

Building upon the initial efforts of the WBSR Task Force, the Susquehanna River Basin Commission (SRBC) predicts a range of costs for remediating the numerous AMD sources in the WBSR watershed (SRBC, 2008). Based on SRBC's recent calculation, full remediation of AMD pollution in the WBSR watershed may require one-time capital investments of between \$110 and \$453 million, along with annual operation and maintenance (O&M) costs of up to \$16 million.<sup>1</sup> The high end of this range could ultimately be reduced if re-mining or reclamation projects are successfully implemented. Savings can also be found if further analysis demonstrates that the watershed can recover without remediating every small pollution source. Additional costs would be incurred to fully restore non-AMD issues at AMLs.

To make the most informed decisions possible, policymakers must consider not just the costs, but also the benefits from making investments to protect and restore watersheds (Schueler, 2000). In fact, assessments of local economic benefits are becoming more common. As detailed in the box below, recent analyses have calculated the local benefits of efforts as large as restoring

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<sup>1</sup> SRBC estimates that remediating the 40% of the watershed for which sufficient data are available would require capital construction investments of between \$43 and \$165 million dollars (SRBC, 2008). Additional communications with SRBC staff clarify that this range is based on the use of passive or active treatment technologies at different sites. Additional site-specific analyses will be required to choose the most appropriate technologies for each site. For the purpose of this report, capital expenditures of between \$110 and \$453 million are assumed to be required to remediate AMD across the entire watershed. This estimate is broadly consistent with the 2005 estimate from the WBSR Task Force, which suggested a need for capital investments of between \$279 and \$464 million (WBSR Task Force, 2005). SRBC estimates O&M costs of between \$5 and \$8 million per year to remediate 40% of the watershed (SRBC, 2008). Based on further communications with SRBC, O&M costs across the entire watershed might total up to \$16 million per year, depending on the choice of passive or active technologies at each site. This estimate is somewhat lower than the WBSR Task Force's 2005 estimate of between \$22 and \$55 million (WBSR Task Force, 2005).

the Great Lakes (Austin et al., 2007a and b), to efforts as small as remediating AMD-impaired watersheds in West Virginia (Schrecongost and Hansen, 2005; Williamson et al., 2007).

The most obvious benefit of AMD remediation to the local community is that funds are pumped into the local economy to design, build, and maintain treatment systems. Many goods and services are provided by local businesses, jobs are created, and these dollars circulate through the economy as workers spend their paychecks on other local goods and services. A restoration economy with “green-collar” jobs is then created in which people work toward environmental restoration that supports local communities over the long term.

Remediation of AMD streams leads to a host of other benefits for local communities and those outside the watershed. Inside the watershed, property values that have been depressed near AMD-impaired streams should rise once remediation is accomplished. Drinking water supply options, now limited or more expensive due to AMD, will expand or become cheaper with cleaner source water. Remediation of polluted streams improves recreational opportunities for local residents and will lead to increased recreational spending by tourists. Finally, remediation improves the aquatic habitat of streams in the watershed, leading to environmental improvements about which many citizens feel passionately.

### **Economic Benefit Analyses**

Economic benefit analyses, like the one performed in this report, have been completed for other watershed improvement efforts, both large and small.

For example, a recent analysis of \$26 billion of proposed water pollution control investments in the Great Lakes region estimates a return of more than \$50 billion in long-term benefits. These benefits include dollars from tourism, fishing, and recreation; increased property values; and other harder-to-quantify benefits. An additional \$30 and \$50 billion in short-term multiplier benefits would also be expected (Austin et al., 2007a and b).

At a much smaller scale, an analysis in the Deckers Creek watershed in north-central West Virginia calculates that about \$10 million of investments in AMD remediation would generate more than \$14 million in economic benefits to local businesses and workers from spending outside funds on remediation projects. Additional annual benefits of more than \$2 million per year would be realized through local expenditures by visitors and by increased non-market quality-of-life value (Schrecongost and Hansen, 2005).

In the nearby Cheat watershed, also impaired by AMD, a recent study estimated willingness-to-pay for remediation, and found that properties located near restoration sites would benefit by \$1.7 million (Williamson et al., 2007).

Table 1 describes each of these types of local economic benefits, and Sections 3 through 6 provide detailed analyses. Section 7 expands this analysis to estimate the benefits that all Pennsylvania residents—both inside and outside the WBSR watershed—receive from remediating AMD in the WBSR watershed. These benefits are based on a willingness-to-pay (WTP) study and provide a broader estimate that includes portions of those benefits quantified elsewhere, as well as other benefits not quantified in Sections 3 through 6.

**Table 1: Types of local economic benefits addressed in this report**

<b>Type of benefit</b>	<b>Description</b>
Money spent locally on remediation	To build remediation projects, money is spent on engineers and contractors, alkaline materials and construction equipment. Local demand for these goods and services stimulates the local economy, strengthening businesses and creating jobs, which in turn become a new source of local purchasing power.
Increased recreation spending	Cleaner streams mean more recreation spending. In the watershed, remediation of AMD-impacted streams will result in increased sport fishing revenues of \$22.3 million. Benefits over and above sport fishing revenues are not calculated but would add to this total.
Higher property values	Property values near AMD-impacted streams are depressed and will increase if AMD is remediated. In Clearfield County alone, the total value lost by owners of the 2,734 parcels within 200 feet of AMD-impacted streams is estimated at more than \$4 million, for an average of more than \$2,500 per acre or almost \$1,500 per parcel.
More options for cleaner, cheaper drinking water	Government agencies have already spent more than \$11 million in the watershed on waterline extensions to correct private drinking water problems cause by AMD. Clean streams also provide new options for future public water supplies.
Environmental improvement (WTP)	People living within and outside the watershed are willing to pay for environmental improvements. People value clean water for a range of reasons, including those listed in this table and other non-use values such as aesthetics. Pennsylvania residents both inside and outside the watershed are willing to pay \$73.6 million for environmental improvements, with a range from \$18.1 to \$171.4 million.

If funds spent to remediate AMD in the watershed originate largely from outside the watershed—from fees on mined coal or from federal or state taxes, for example—then the local economic benefits are most clearly evident. But even if remediation funds originate within the watershed, several kinds of local economic benefits like those described in this report are realized.

It is only by considering both the costs and benefits that policymakers and local stakeholders can make the most informed choices possible as they consider their priorities and funding options for such a large and comprehensive remediation project.

Figure 1: The West Branch Susquehanna River watershed

