

MOUNTAINTOP REMOVAL CASE STUDY

SPRUCE MINE NO. 1 SURFACE MINE LOGAN COUNTY, WEST VIRGINIA

PERMIT NUMBERS:

SMCRA: S-5013-97

USACE: 199800436-3 (SECTION 10: COAL RIVER)

NPDES: WV1017032



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ABOUT RAINFOREST ACTION NETWORK

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TABLE OF CONTENTS

BACKGROUND.....	7
HISTORY OF THE SPRUCE NO. 1 SURFACE MINE.....	18
USEPA’S PROPOSED DETERMINATION FOR THE SPRUCE NO. 1 MTR MINE: ANALYSIS AND RECOMMENDATIONS.....	24
SUMMARY AND CONCLUSIONS.....	35

TABLE OF FIGURES

Figure 1: Existing and permitted surface mining operations surrounding the Spruce No. 1 permit area.....	6
Figure 2: Coal production, employment, and surface mining for Logan County, 1983-2009.....	7
Figure 3: Cumulative extent of historical and permitted surface mining in Logan County, West Virginia.....	9
Figure 4: Detailed timeline for the Spruce No. 1 mine permit.....	20
Figure 5: Cumulative impact on the Spruce Fork sub-watershed from historical and permitted surface mines and Spruce No. 1.....	28

ABBREVIATIONS

ARC	Appalachian Regional Commission
CFR	Code of Federal Regulations
CMP	Compensatory Mitigation Plan
CVWA	Clean Water Act
ECP	Enhanced Coordination Procedures
EIA	Energy Information Administration
EIS	Environmental Impact Statement
GIS	geographic information systems
MHSA	Mine Safety and Health Administration
MOU	Memorandum of Understanding
MSHA	Mine Safety and Health Administration
MTR	mountaintop removal
NPDES	National Pollutant Discharge Elimination System
OSMRE	Office of Surface Mining, Reclamation and Enforcement
SMCRA	Surface Mining Control and Reclamation Act
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WVDEP	West Virginia Department of Environmental Protection
µS/cm	micro-Siemens per centimeter

EXECUTIVE SUMMARY

The Spruce No. 1 mountaintop removal coal mine in Logan County, West Virginia, is one of the largest mountaintop removal mines ever proposed in Central Appalachia. Currently, Logan County, located in the southwestern region of West Virginia, is one of the most heavily surface-mined counties, ranking second in both total coal production and production from surface mining in the state.

As a result of the projected impacts to public health, water quality, and forest and wildlife habitat, the United States Environmental Protection Agency (USEPA) is currently considering a veto of the Arch Coal Spruce No. 1 mountaintop removal (MTR) permit. Thus far, the USEPA has exercised its veto authority under the Clean Water Act Section 404(c) by proposing “to prohibit, restrict, or deny the specification, or the use for specification” of three sites that Arch Coal has requested to use for the disposal of fill material associated with the Spruce No. 1 mine: the Pigeonroost Branch, Oldhouse Branch, and the remainder of Seng Camp Creek streams.¹ The USEPA published its Proposed Determination for the Spruce No. 1. mine on April 2, 2010, and a Final Determination is expected by the end of the calendar year.

In April 2010, USEPA issued new guidelines for surface mining permits. The new guidance stated that when Regional Offices review permit applications they should verify that the permit is consistent with Clean Water Act statutes and USEPA regulations. Regional Offices must also show that mining activities will not cause or contribute to violations of water quality standards, contaminate drinking water supplies, or add toxic pollutants that kill or impair stream life. The USEPA Proposed Determination of the Spruce No. 1 mine from April 2 details various ways that the mine permit would, according to the science and analysis of the permit, violate the agency’s new guidelines: elevated conductivity levels (above the proposed maximum of 500 $\mu\text{S}/\text{cm}$); total dissolved solids in the receiving streams and downstream waters; discharge of toxic levels of selenium; and possible promotion of conditions that would support the growth of toxic golden algae. Each of these potential impacts would, in USEPA’s own words, “cause or contribute to significant degradation of water quality” and have “unacceptable adverse impacts [on] fish and wildlife resources.”

This case study finds that the environmental impacts of the Spruce No. 1 mine would result in the destruction of 2,278 acres of temperate rainforest and the construction of six valley fills, which would permanently bury 7.5 miles of streams in the Spruce Fork sub-watershed.² In addition, for a region already devastated by surface mining, the Spruce No. 1 mine would contribute severely to the cumulative impacts on water quality and loss to forest and wildlife habitat in Logan County.

Perhaps of greatest importance for consideration in determining the permit’s ability to meet USEPA guidelines are the existing and potential cumulative impacts of surface mining and the Spruce No. 1 mine on the Spruce Fork sub-watershed. By the time all mining would be completed for the Spruce No. 1 mine, surface mining operations and associated valley fills would directly and permanently impact—or fill—approximately 63 miles of streams, for a total cumulative impact of 22% of the Spruce Fork sub-watershed.

¹ Seng Camp Creek is partially filled, while the Pigeonroost Branch and Oldhouse Branch streams have yet to be impacted. Seng Camp Creek was allowed to be minimally filled as the result of an agreement made in 2007. Pigeonroost Branch and Oldhouse Branch are providing clean freshwater dilution to Spruce Fork.

² The Spruce Fork sub-watershed is part of the Little Coal River watershed, which is part of the greater Coal River sub-basin.

Based on the findings in this case study about the Spruce No. 1 mine's potential impacts on the environment and nearby communities, we recommend that USEPA, in its Final Determination, deny specification of Pigeonroost Branch, Oldhouse Branch, and the yet-to-be impacted portions of Seng Camp Creek as sites suitable for receiving dredged and/or fill material in association with the proposed mining operation. We recommend this action because the mining permit, as proposed, violates USEPA's guidance as published on April 1, 2010.

Summary of conclusions:

The following provides an explanation of the applicable USEPA surface mining permit guidelines as well as an analysis of how the Spruce No. 1 permit pertains to each guideline:

- *Mining activities will not cause or contribute to violations of water quality standards, contaminate drinking water supplies, or add toxic pollutants that kill or impair stream life.*

Each of the potential impacts from the Spruce No. 1 mine permit as described in USEPA Proposed Determinations documents would, in USEPA's own words, "cause or contribute to significant degradation of water quality" and have "unacceptable adverse impacts [on] fish and wildlife resources," thereby violating this guideline.

- *Applicants have evaluated a full range of alternatives to discharging into waters of the US.*

The United States Army Corps of Engineers (USACE) is required to review proposed alternatives to proposed mining operations, as set forth in mining permits, and to require the coal company to revise the permit should USACE determine that the chosen alternative would have unacceptable adverse effects on waters of the US. USEPA has concluded that the chosen and USACE-approved alternative—the current mining plan—would have unacceptable adverse effects.

- *Mining companies have avoided and minimized their direct, indirect, and cumulative environmental impacts to streams, wetlands, watersheds, and other aquatic resources.*

To ensure that permitted valley fills adhere to this guideline, USEPA requires that the permit "demonstrate compliance with applicable water quality standards," and that "there is no significant degradation associated with the first valley fill before the [coal company] may begin construction of subsequent [valley] fills." According to USEPA data, the active Seng Camp Creek valley fill associated with Spruce No. 1 has failed to comply with applicable water quality standards. As a result, the remainder of the proposed valley fill sites—Pigeonroost Branch and Oldhouse Branch—according to USEPA guidelines, cannot be approved for specification as suitable sites for disposing of mining waste..

- *Remaining mining-related aquatic impacts have been effectively mitigated by establishing, restoring, enhancing, or preserving streams and wetlands.*

In relation to the mitigation of mining impacts, USEPA guidance states that "unavoidable mining-related environmental impacts must be effectively mitigated by establishing, restoring, enhancing, or preserving streams and wetlands; improving water quality; addressing drinking water impacts; and reclaiming watersheds when mining is completed." USEPA concludes that the Spruce No. 1

mitigation plan is “unlikely to sustain the biological, chemical, and physical characteristics of the affected streams” because it “fails to recognize the true functioning of healthy headwater streams and so therefore fails to replace the streams’ lost ecological services,” and that “the project may have unacceptable adverse impacts to fish and wildlife resources...”Therefore, USEPA recognizes that the proposed Spruce No. 1 mining operation violates this guideline.

In addition to permit guidelines, USEPA explicitly recognizes that “surface coal mining can have adverse environmental and health impacts on neighboring communities,” and notes that federal statutes and regulations require, during the review of surface mine permits, “consideration of the full range of potential impacts on the environment, human health, and communities,” particularly low-income or minority populations. Logan County qualifies as a low-income population as 24% of its residents live below the poverty line, which exceeds state and national averages. Given the economic status of Logan County residents, and the probable impacts experienced by neighboring communities, this case study concludes that before the Spruce No. 1 mine can be approved “additional analysis of the potential for disproportionately high and adverse effects on the low-income populations (in the vicinity of the Spruce No. 1 mine) needs to be conducted.”

USEPA regulations and Clean Water Act guidelines provide for the protection of public health, water quality, and other environmental resources. The historical application of rules and regulations pertinent to Appalachian surface mining operations has failed to achieve the intended goals. The potential for the operation of the Spruce No. 1 mine to result in adverse and irreversible environmental effects, both individually and cumulatively, requires a strict application of Clean Water Act guidelines as a decision is made on the permit. It is the obligation of USEPA to ensure that the predicted impacts from Spruce No. 1 are avoided, even if doing so requires a veto of the permit, as authorized under Clean Water Act Section 404(c).

Additional Findings of Note:

- Logan County qualifies as a low-income population because 24% of its residents live below the poverty line, exceeding state and national averages.
- In 2009, Logan County produced 16.6 million tons of coal, 60% of which was produced through surface mining
- The Spruce No. 1 mine is expected to produce approximately 2.7 million tons of coal annually over its 15-year lifespan, for a total of 41 million tons of bituminous coal.
- Of the 456 square miles (290,000 acres) of land in Logan County, approximately 81 square miles (51,700 acres)—an area 20% greater than the size of Washington, D.C.—have been impacted by surface mining and valley fills, or are currently permitted for surface mine operations, amounting to 18% of the county land area.
- Twenty-six streams within the Spruce fork watershed have been listed as biologically impaired.
- The Spruce No. 1 mine would increase the cumulative impact by approximately 10 miles to 63 total miles of streams lost, amounting to 22% of the watershed.
- USEPA notes that within the Spruce Fork sub-watershed alone, more than 34 past and present surface mine permits have been issued, which collectively occupy more than 33% of the land area.

1. BACKGROUND

1.1 Overview of the Spruce No. 1 surface mine

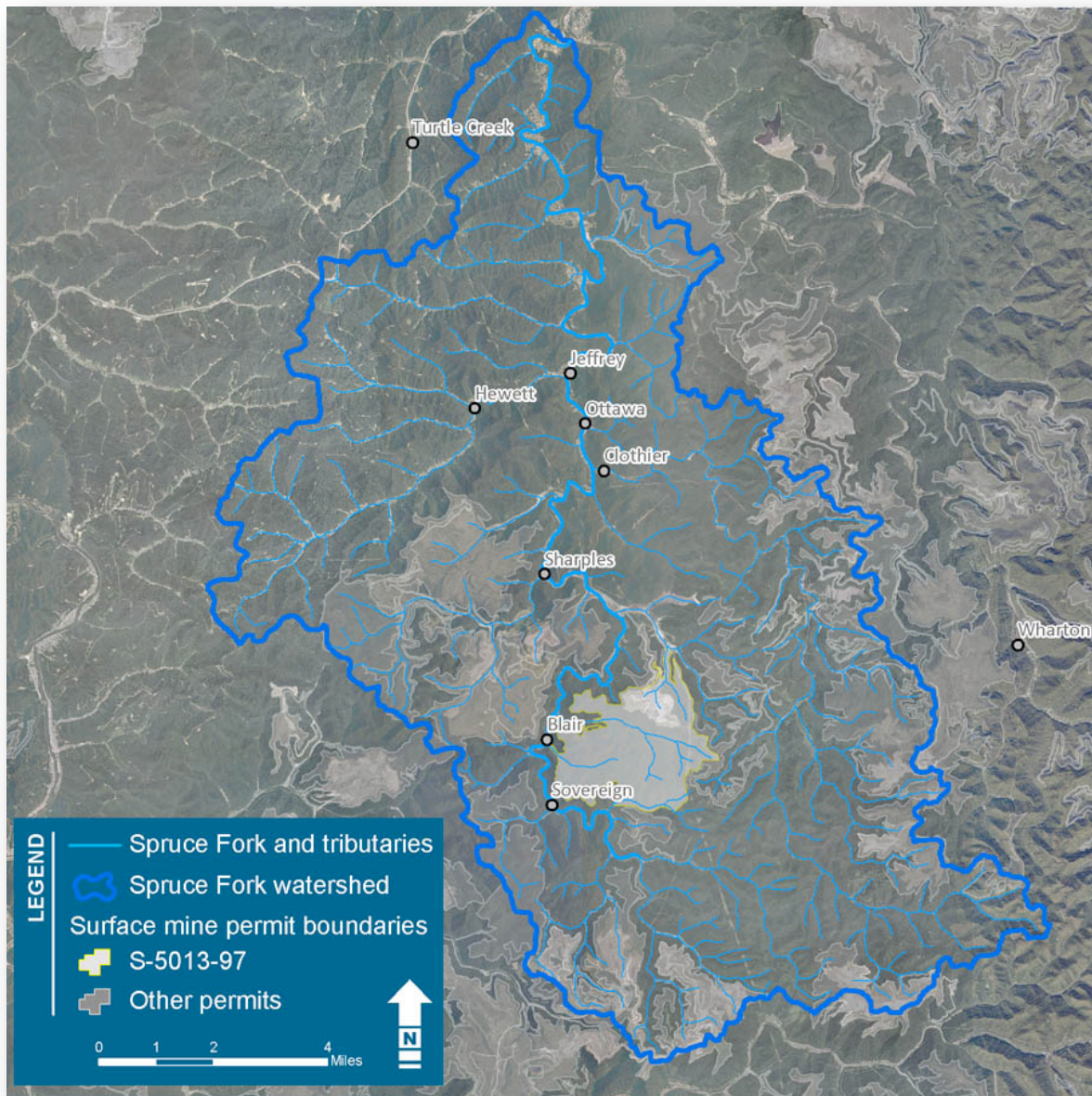
The Spruce No. 1 surface mine in Logan County, West Virginia, is one of the largest mountaintop removal (MTR) coal mines ever proposed in Central Appalachia. As most recently proposed, the mine would destroy 2,278 acres (3.6 square miles) of temperate rainforest, remove 400-450 vertical feet of mountain, and require six valley fills, permanently burying 7.5 miles of streams in the Spruce Fork sub-watershed with 110 million cubic yards of mining spoil, which is enough to fill 33,600 Olympic-sized swimming pools.

Currently permitted to Mingo Logan Coal Co., a subsidiary of Arch Coal, Inc., the mine would serve as an extension of previous and existing Arch Coal-subsidary MTR mines situated just to the northwest, known collectively as the Dal-Tex mining complex. In total, nine mining operations comprise the complex and span an area of approximately 6,700 acres (10.5 square miles). The addition of Spruce No. 1 would increase the impacted area to 8,987 acres (14 square miles) (See Figure 1) (WVDEP, 2010).

As proposed, the Spruce No. 1 MTR mine was expected to produce approximately 2.7 million tons annually over its 15-year lifespan, for a total of 41 million tons of bituminous coal (USEPA, 2010a). The estimated annual production of the mine amounts to approximately 2% of total coal production in West Virginia in 2009, and 16% of total production in Logan County (MSHA, 2010a). However, after thirteen years of regulatory changes, legal challenges, and permit revisions, the Spruce No. 1 mine now awaits a final determination by the United States (US) Environmental Protection Agency (USEPA). Exercising its Clean Water Act (CWA) Section 404(c) veto powers, USEPA is expected to reach a final determination on the permit by the end of the 2010 calendar year.

The remainder of this section of the report provides background information on the historical economic and environmental impacts of coal and surface mining for Logan County. Subsequent sections provide further details on the history of the Spruce No. 1 MTR mine; the potential impacts of the proposed mining to aquatic resources, wildlife, and Appalachian communities; and USEPA's concerns regarding these impacts.

Figure 1: Existing and permitted surface mining operations surrounding the Spruce No. 1 permit area



1.2 Logan County, West Virginia

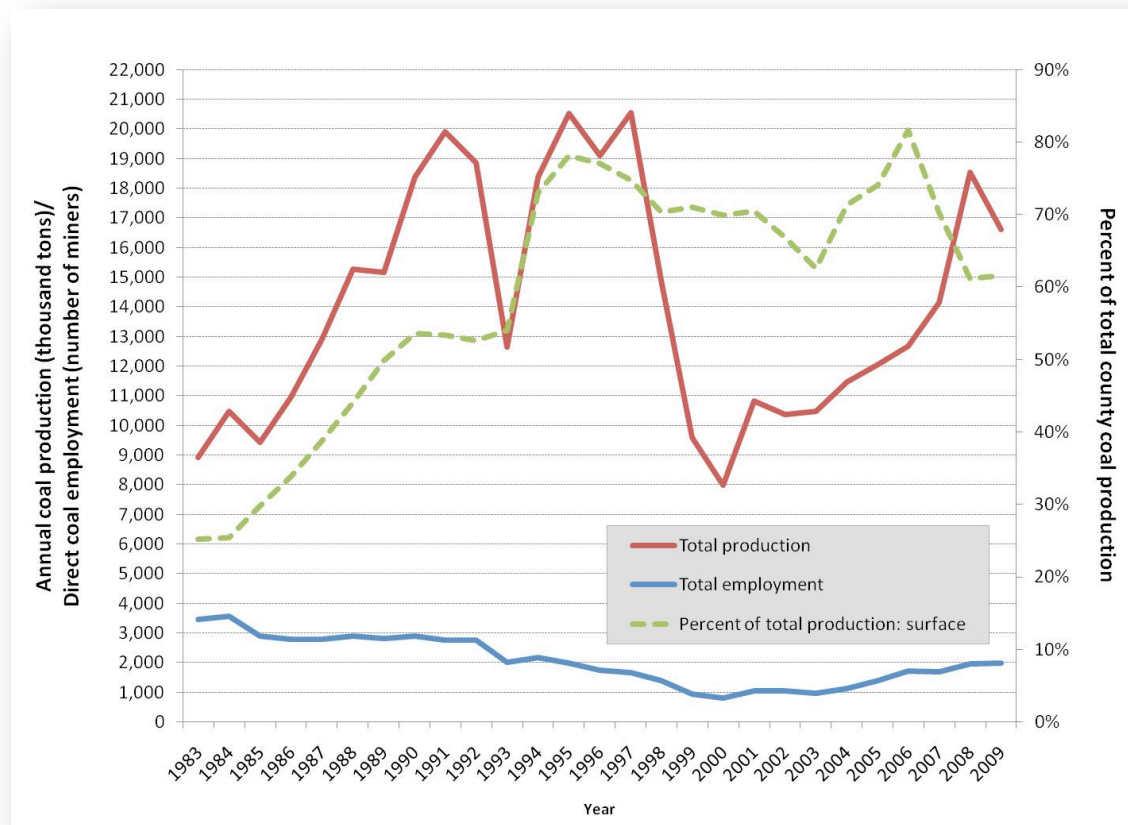
1.2.1 Trends in coal production and employment

Logan County, located in the southwestern region of West Virginia (see the inset in Figure 3), spans an area of 456 square miles, and is one of the most heavily surface-mined counties in West Virginia, ranking second in both total production and production from surface mining. In 2009, the county produced 16.6 million tons of coal, accounting for 12% of total state coal production (MSHA, 2010a). Of that, approximately 10.2 million tons, or 60% of total county coal production, were produced through surface mining.

Between 2006 and 2009, county coal production increased by approximately 4 million tons. As illustrated in Figure 2, the share of total production from surface mining declined over this time period. Notably, this was the result of an increase of 4 million tons of production at underground mines, indicating that underground mining in Logan County, at least to some extent, can provide a boost in coal production when production from surface mining is being inhibited.

Approximately 2,000 miners were directly employed in the coal industry in Logan County in 2009, representing 16% of total county employment. However, between 1990 and 2009, direct coal employment for the county fell by 31%, for a total loss of approximately 900 coal jobs, even though total production was roughly equal in these two years (MSHA, 2010a) (See Figure 2).

Figure 2: Coal production, employment, and surface mining for Logan County, 1983-2009



Source: MSHA (2010a).

1.2.2 Socioeconomic status

Despite the fact that the economy in Logan County is strongly dependent on coal, and that the coal extracted from the county in 2008 generated an estimated \$1.3 billion in gross production value,¹ coal mining has not provided much in the way of economic growth or diversification for the local economy or the residents. In fact, the Appalachian Regional Commission (ARC) designates Logan County as an “At Risk” county in Appalachia, meaning the county is at risk of becoming economically distressed, and that it ranks between the worst 10-25% of the nation’s counties for economic status (ARC, 2010a).

In 2009, Logan County—one of 55 counties in West Virginia—was home to an estimated 35,525 residents, or about 2% of the state population. The county population has been declining since at least 1990. Between 1990 and 2000, county population declined by 5,322, or approximately 12.4%. Coincidentally, during the same period, county coal production fell by over 10 million tons. Between 2000 and 2008, the county lost another 2,185 residents, for an additional decline of 5.8% (ARC, 2010b). However, a resurgence in coal production through 2008, resulting in production levels once again reaching 18.5 million tons, failed to prevent additional population declines.

Additionally, in 2009, Logan County had an unemployment rate of 8.3%, whereas the state’s unemployment rate was 7.9% (USDA, 2010). This is significantly higher—as is the case for many counties around the US as a result of the economic recession—than the average rate of 4.5% for the county between 2006 and 2008. Employment losses were not experienced in the county’s coal industry, however, as direct employment in coal was actually higher in 2009 than in 2008, and stood as the highest level of direct coal employment for the county since 1994.

The per-capita market income of Logan County was only 77% of the state average and approximately 50% of the national average for 2007 (ARC, 2010a). Similarly, in 2008, Logan County experienced a poverty rate of 23.1%, compared to the state average of 17.4% and the national average of 13.2% (USDA, 2010).

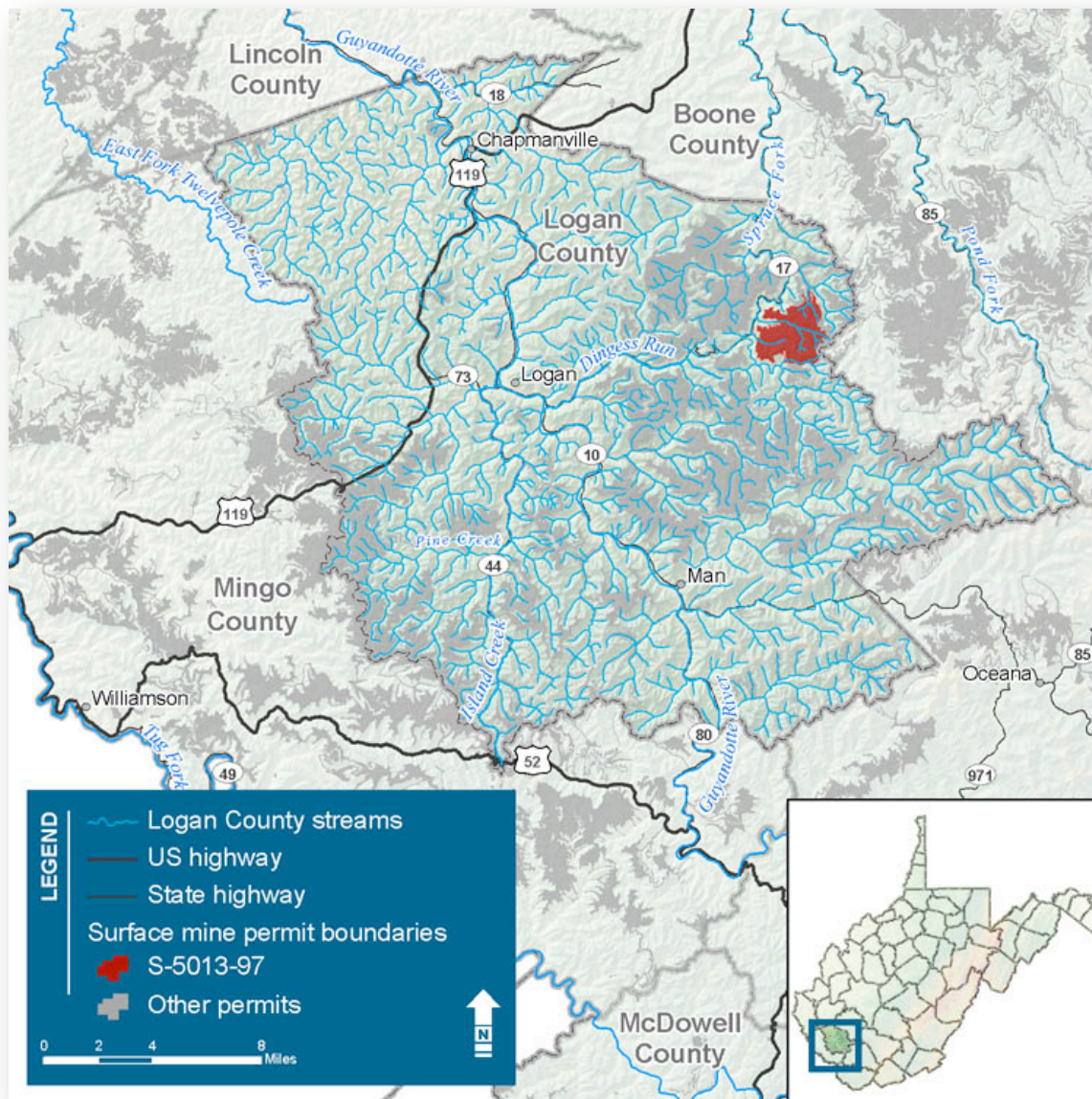
Overall, by most poverty and income parameters, Logan County experiences a lower socioeconomic status than the rest of the state, and a much lower socioeconomic status than the rest of the nation.

1.3 Historical and permitted impacts from surface mining operations in Logan County and the Spruce Fork sub-watershed

Conducting a geographic information system (GIS) analysis of the cumulative land impacts of surface mining in Logan County, as shown in Figure 3, it was calculated that of the 456 square miles (approximately 290,000 acres) of land in Logan County, approximately 81 square miles (51,700 acres)—an area 20% greater than the size of Washington, D.C.—have been impacted by surface mining and valley fills, or are currently permitted for surface mine operations. In other words, historical, active, and permitted surface coal mines will have impacted approximately 18% of the land area in Logan County by the time all of the active and permitted mining has been completed. **These impacts do not include the additional impacts that would result from the proposed mining for the Spruce No. 1 permit, shown in red in Figure 3.**

¹ This estimate is based on total production and average coal prices for 2008 as reported by the Energy Information Administration (EIA, 2009). Coal prices for 2009 were not available.

Figure 3: Cumulative extent of historical and permitted surface mining in Logan County, West Virginia



Even without considering the Spruce No. 1 mine, the impact of surface mining on the watersheds and streams in the region has been expansive. The GIS analysis conducted for this study, along with USEPA's analysis, shows that historical and pending surface mines and associated valley fills will result in significant cumulative impacts to the land and streams lying within the Spruce sub-watershed as well the Little Coal River sub-watershed and the broader Coal River sub-basin. The Spruce Fork sub-watershed, the watershed within which Spruce No. 1 has been proposed, spans an area of approximately 126 square miles. Historical and currently permitted impacts to land within the watershed (also known as the drainage area), not including the Spruce No. 1 surface mine, amount to nearly 31 square miles. In other words, should all permitted surface mines proceed as proposed, total impacts to the Spruce Fork drainage area would amount to 24% of the watershed.

Approximately 286 miles of streams drain the watershed. Historical and permitted surface mining operations, by the time all permitted mining has been completed, will have directly and permanently

impacted—or filled—over 53 miles of streams, cumulatively impacting 19% of the Spruce Fork sub-watershed's streams. These impacts are described in greater detail in Section 3.3.4, as part of the summary of USEPA's findings on the potential cumulative impacts to land and streams that would result from the Spruce No. 1 MTR mine.

Understanding recent actions taken by the USEPA in relation to the Spruce No. 1 mine, as well as the data and information describing the mine's potential impacts to wildlife and aquatic resources, can be facilitated with an upfront overview of the guiding regulations currently being applied to the review of surface mine and valley fill permits in Appalachia. To that end, what follows is a brief summary of USEPA's most pertinent document, the guidance memorandum issued in April 2010.

1.4 USEPA's April 1, 2010 guidance memorandum

1.4.1 Overview

On April 1, 2010, USEPA issued a key memorandum, "Improving USEPA Review of Appalachian Surface Coal Mining Operations under the Clean Water Act, National Environmental Policy Act, and the Environmental Justice Executive Order," to Regions 3, 4, and 5 regarding the coordination of various agencies' statutes that pertain to surface mining and water quality in Appalachia. According to the USEPA press release, this guidance sets "clear benchmarks for preventing significant and irreversible damage to Appalachian watersheds at risk from mining activity" (USEPA, 2010b, p. 1).

The goal of the memorandum is "to identify the steps permittees and implementing state agencies should take to prevent harmful public health, water quality, and other environmental impacts associated with Appalachian Surface Mining and to more effectively consider the voices of adversely affected communities in the Appalachian coalfields" (USEPA, 2010c, p. 1). In order to do so, the guidance "clarifies how [CWA] requirements apply to the disposal of mining overburden in streams to reduce the size and number of valley fills, to limit water quality contamination of streams near mining operations, and to prevent significant environmental degradation of streams and wetlands" (USEPA, 2010b, p. 1).

The memorandum summarizes the commitment made by USEPA in June 2009 as part of an interagency Memorandum of Understanding (MOU)² on MTR and valley fills—"to improve its review of permits issued under [CWA] Section 404 and to bolster coordination with states on both Section 402 permits for pollutant discharge from valley fills and state water quality certifications [Section 401] for mining operations" (USEPA, 2010c, p. 3). Subsequent USEPA publications released since the issuance of the memorandum—summarized in the following sections—review existing CWA permitting practices and provide recommendations for how both state and federal agencies should improve and revise their review of mining permits.

1.4.2 *Supporting science describing the impacts of surface mining on water resources*

The issuance of the memorandum was motivated by recent developments in the science regarding water quality, conductivity, and stream ecosystem function, and by USEPA's conclusion of its review of permitting actions under CWA Sections 402 and 404 for Appalachian surface coal mining.

For instance, a peer-reviewed article by Pond et al. of USEPA characterizes the effects of surface mining on macroinvertebrate communities. The study, completed in 2008, documents these effects in 37 streams in West Virginia, two-thirds of which were mined or impacted by valley fills, and 10 of which were unmined.

The primary findings of the article are as follows:

1. Mining causes shifts in "species assemblage," negatively impacting species richness, diversity, and composition on both the family- and genus-levels. Members of the Ephemeroptera taxa disappear entirely;
2. 93% of mined streams and 0% of unmined streams were biologically impaired by surface mining;
3. Mining has subtle to severe impacts on benthic macroinvertebrate communities; and
4. Mountaintop mining can be causally linked with biological impairment (Pond et al., 2008).

² For more information about the June 2009 interagency MOU, see: <http://water.epa.gov/lawsregs/guidance/wetlands/mining.cfm#mou>

This article is significant in that it links biological impairment and altered benthic communities with increased levels of specific conductance. This linkage may be especially important as state environmental agencies and USEPA consider issuing limits on conductivity levels for surface mine permits.

Similarly, Dr. Margaret Palmer, director of the University of Maryland's Chesapeake Biological Laboratory, and Dr. Emily Bernhardt, assistant professor at Duke University's Department of Biology, issued a white paper in 2009, summarizing key scientific findings on the effects of mountaintop mining and valley fills on local and regional aquatic ecosystems.

In their review of existing scientific literature, the authors found that:

1. Mountaintop mining and valley fills "radically alter" the topography and hydrology of the affected area;
2. Mountaintop mining and valley fills damage stream headwaters by altering stream structure, function, geochemistry, hydrologic processes, and biota communities;
3. Cumulative impacts of mountaintop mining and valley fills include increased levels of conductivity, ions, trace elements, and total or dissolved solids, each of which are highly correlated with biological impairment; and
4. Stream mitigation practices have been under-regulated, do little to restore stream habitat, and rarely attempt to restore stream function or reduce cumulative impacts (Palmer and Bernhardt, 2009).

These studies highlight the growing recognition of the importance of conductivity levels on stream ecosystem function, as described in further detail in Section 3.3.2. In other words, "numerous studies, data submitted to permitting authorities for proposed mining activities, and some state impaired waters lists...have shown that high levels of conductivity, dissolved solids, and sulfates are a primary cause of water quality impairments from downstream mine discharges" (USEPA, 2010c, p. 5).

Soon after the release of the April 1 memorandum, USEPA announced two of its own draft scientific reports in the Federal Register on April 12, 2010. The first, "The Effects of Mountaintop Mines and Valley Fills on Aquatic Ecosystems of the Central Appalachian Coalfields," summarizes current scientific findings related to the environmental impacts of mountaintop mines and valley fills in the Central Appalachian Basin, which covers about 12 million acres in West Virginia, Kentucky, Virginia, and Tennessee. According to the report, "mountaintop mining and valley fill lead directly to five principal alterations of stream ecosystems:

1. Springs, intermittent streams, and small perennial streams are permanently lost with the removal of the mountain and from burial under fill;
2. Concentrations of major chemical ions are persistently elevated downstream;
3. Degraded water quality reaches levels that are acutely lethal to standard laboratory test organisms;
4. Selenium concentrations are elevated, to the point of having caused toxic effects in fish and birds;
5. Macroinvertebrate and fish communities are consistently and significantly degraded" (USEPA, 2010d, p. 1)

The second, "A Field-based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams," summarizes the use and application of conductivity levels in assessing the impact of mountaintop

mining and valley fills on stream aquatic ecosystems. Instead of using “toxicity test results,” the report demonstrates that observable levels of dissolved salts can be used to determine the loss of 5% of genera from aquatic streams in West Virginia and Kentucky (USEPA, 2010e). This finding is significant in that it substantiates establishing a conductivity level or benchmark for the Central Appalachia region. A benchmark for conductivity could have implications for determinations of stream function, and therefore for permit issuance under this new guidance.

Building on the findings of each of these studies, the USEPA provides a series of recommendations to guide each Region’s fulfillment of the tasks outlined in the June 2009 MOU mentioned above in Section 1.4.1.

1.4.3 **USEPA recommendations for the permitting of surface mines with valley fills**

According to the guidance memorandum, when Regional Offices review notices of permits, they should verify, consistent with existing CWA statutes and USEPA regulations, that:

1. **“Mining activities will not cause or contribute to violations of water quality standards, contaminate drinking water supplies, or add toxic pollutants that kill or impair stream life”
(40 CFR 230.10(c))**

USEPA states that no discharge of dredged or fill material may be permitted if it causes or contributes to violations of any applicable state water quality standard or if the nation’s waters would be significantly degraded. USEPA recognizes that increased conductivity levels have a significant impact on stream ecosystem health; therefore, they recommend maintaining levels of conductivity less than 300 micro-Siemens per centimeter ($\mu\text{S}/\text{cm}$), and state that levels above 500 $\mu\text{S}/\text{cm}$ are likely to be associated with “significant degradation of the aquatic ecosystem (USEPA, 2010c, p. 3). To prevent “significant degradation” to waterways, USEPA recommends a coordinated effort among federal agencies and individual mining operators to ensure that conductivity levels remain below 500 $\mu\text{S}/\text{cm}$. Further, USEPA states that mining projects projected to increase conductivity levels above 300 $\mu\text{S}/\text{cm}$ should include permit conditions requiring adaptive action to prevent conductivity levels that exceed 500 $\mu\text{S}/\text{cm}$.

2. **“Applicants have evaluated a full range of potential alternatives to discharging into waters”
(40 CFR 230.10(a))**

This statute requires that coal companies have exhausted all potential alternatives to the discharge of mining-related spoil into nearby streams, particularly as a result of the construction of valley fills. The United States Army Corps of Engineers (USACE) is required to review the proposed alternatives put forth in the permit, and to require the permittee to revise the permit should USACE determine that the chosen alternative would have unacceptable adverse effects on waters of the US.

3. **“Mining companies have avoided and minimized their direct, indirect, and cumulative environmental impacts to streams, wetlands, watersheds, and other aquatic resources”
(40 CFR 230.10(a) and (d))**

The USEPA guidance recommends that regional permitting agencies ensure that mining permits “avoid and minimize their direct, indirect, and cumulative adverse environmental impacts to streams, wetlands, watersheds, and other aquatic resources” (USEPA, 2010f, p. 4). As stated by USEPA, permits that eliminate or significantly reduce the number and size of valley fills associated with their projects, or more specifically, projects with no or few valley fills, are expected to have a greater chance of receiving a permit. Conversely, projects with multiple fills “will generally raise serious questions about their compliance with CWA regulations and may require permit objection” (USEPA, 2010f, p. 4). To ensure that permitted valley fills adhere to this guideline, USEPA recommends that the permitting of valley fills be sequenced, meaning that “only one valley fill should be authorized before subsequent fills may go forward, unless site-specific data suggest no potential downstream water quality concerns.” Additionally, USEPA requires that the permit “demonstrate compliance with applicable water quality standards,” and that “there is no significant degradation associated with the first valley fill before the permittee may begin construction of subsequent fills” (USEPA, 2010f, p. 5).

4. “Remaining mining-related aquatic impacts have been effectively mitigated by establishing, restoring, enhancing, or preserving streams and wetlands” (40 CFR 230.10(d))³

In relation to the mitigation of mining impacts, the USEPA guidance states that “unavoidable mining-related environmental impacts must be effectively mitigated by establishing, restoring, enhancing, or preserving streams and wetlands; improving water quality; addressing drinking water impacts; and reclaiming watersheds when mining is completed” (USEPA, 2010f, p. 5). To ensure effective mitigation, permit applicants should conduct functional stream impact assessments that include biological parameters as well as traditional water quality parameters, and ensure that these assessments are effectively used to quantify the environmental effects of individual mining projects on streams.

Finally, the memorandum highlights USEPA’s strategies for improving the coordination between USEPA and USACE, as agreed to in the previously-mentioned MOU released in 2009. Under the CWA, USEPA has the obligation to develop guidelines with USACE, the option to “review public notices and general permit pre-construction notifications for Section 404 permits for consistency with the Guidelines,” and, as it pertains to this report, **the authority to “‘veto’ a permit if the Administrator determines that a discharge will have an unacceptable adverse effect”** (USEPA, 2010c, p. 17).

The following section presents USEPA’s findings and recommendations pertaining to the Spruce Fork No. 1 mine. The concluding section summarizes USEPA’s findings and how these findings should guide USEPA’s use of its CWA Section 404(c) veto authority given the potential for the Spruce No. 1 mine to cause or contribute to significant adverse effects on waters of the US.

³ For another useful summary of the April 11, 2010 USEPA guidance document, see the MTR case study for the Pine Creek Surface Mine, conducted by Downstream Strategies and released to Rainforest Action Network on July 20, 2010. The document is available at www.ran.org.

2. HISTORY OF THE SPRUCE NO. 1 SURFACE MINE

2.1 Introduction

Mingo Logan Coal Co.'s Spruce No. 1 surface mine is the largest authorized MTR operation in Appalachia, and occurs in a watershed where many streams have been impacted by past mining activities. The mine is one of the most intensely debated MTR mines in Appalachia. Located in Logan County near the town of Blair and along Pigeonroost Hollow, the region surrounding the proposed mine operation bears significance as one of the most intensely mined in the state, and also as the site of one of the most violent labor conflicts in the twentieth century, the Battle at Blair Mountain, a conflict between 10,000 miners and coal companies in 1921. A battlefield in its own right, Spruce No. 1 mine has had a long and contorted history that spans 13 years, three federal agencies, two state agencies, three citizen groups, and countless miners and bystanders. A brief history of the Spruce No. 1 mine follows (also see Figure 4).

2.2 1997-1998: Hobet's Spruce No. 1 mine

As proposed, the Spruce No. 1 mine was to be the largest mountaintop removal mine permit in history, spanning 3,113 acres and creating five valley fills that would permanently fill six miles of streams, and directly impact more than ten miles of streams (USEPA, 2010a). Spruce No. 1 mine was originally permitted by the West Virginia Department of Environmental Protection (WVDEP) to Hobet Mining, Inc., a subsidiary of Arch Coal, Inc., in November 1998. The 404 permit associated with valley fills proposed for the mine was initially approved by USACE in January 1999. However, subsequent events prevented the mine from moving forward in the permit process until 2007.

2.3 1998-2000: Contention brews

From its inception, Spruce No. 1 mine incited contention from local landowners and environmental groups. The initial lawsuit attributable to the mine, Bragg v. Robertson (Bragg v. Robertson, 1998), was one of many that contested the legality of issuing a permit for the construction of valley fills in the streams surrounding Spruce No. 1 mine. Initially, the suit included citizens (Bragg et al.) and the West Virginia Highlands Conservancy as plaintiffs, and USACE (Robertson), WVDEP, and the West Virginia Coal Association as defendants. Later, the suit gained the attention of USEPA, who sided with the plaintiffs, and the United Mine Workers of America and members of the West Virginia political establishment, who sided with the defendants. Chief District Judge Charles H. Haden II in the Southern District Court of West Virginia granted an injunction against USACE in March 2009, preventing the agency from further issuing mining permits, but the injunction was stayed as soon as the decision was appealed. The appeal went to the US 4th Circuit of Appeals, where the appeal was upheld on two counts and remanded back to the applicable district court.

2.4 2000-2006: Compromise begins

Between 2000 and 2006, most activity on Spruce No. 1 revolved around the composition of various iterations of the Environmental Impact Statement (EIS). Per compliance with the National Environmental Policy Act, USACE filed a notice of intent to complete an EIS in February 2000. The next six years were filled with public scoping meetings, rounds of revisions, and dialogue between Arch Coal, the USACE Huntington District Office, the USEPA Region 3 Office, and the public. USACE modified the EIS and Arch Coal modified its various permits. Even though the EIS was formally re-drafted at least twice, both the US Fish and Wildlife Service (USFWS) West Virginia Field Office and USEPA Region 3 Office issued formal letters expressing dissatisfaction with the proposed stream mitigation plans contained in the permit. USACE heeded these and other comments and re-formulated the EIS to

contain other alternatives; simultaneously, WVDEP and Arch Coal formally modified its National Pollutant Discharge Elimination System (NPDES) permit four times.

After rounds of EIS revisions and NPDES modifications, the potential impact from the Spruce No. 1 mine had been reduced to 2,278 acres, six valley fills, and over 42,000 feet of ephemeral, intermittent, and perennial stream channels (USEPA, 2009a). In 2007, NPDES permit modifications authorized 28 different outfalls. The Spruce No. 1 mine also changed hands from Hobet Mining, to another of Arch Coal's subsidiaries, the Mingo Logan Coal Company.

While the Spruce No. 1 EIS and permit applications evolved, regulation of mountaintop removal mining in Appalachia developed in parallel. In 1999, USACE, USEPA, OSMRE, USFWS, and WVDEP filed a notice of intent to prepare a programmatic EIS to standardize the regulation surrounding mountaintop removal in Appalachia. This process was accelerated by the pending suit that contested the legality of valley fills (Bragg v. Robertson, 1998). In February 2005, USACE, USEPA, OSMRE, and USFWS signed a MOU committing to enhanced coordination of valley fill permitting review. Finally, in October 2005, USACE, USEPA, OSMRE, USFWS, and WVDEP released a final programmatic environmental impact statement (PEIS), to "improv[e] agency programs under the Clean Water Act, Surface Mining Control and Reclamation Act, and the Endangered Species Act... to reduc[e] the adverse environmental impacts of mountaintop mining operations and excess spoil valley fills in Appalachia" (USEPA, 2005, p. 1).

2.5 2006-2008: USACE and USEPA cooperative efforts wane

From 2006 to 2008, federal agencies continued to modify the Spruce No. 1 EIS and NPDES permit. On September 22, 2006, USACE issued its final EIS for Spruce No. 1 mine; barely one month following its release, USEPA released comments on the final EIS that express concerns with the inadequacy of the EIS. **In November 2006, USEPA wrote in the Federal Register that it "continues to have environmental concerns about the project's contribution to cumulative impacts,...methods used for the stream functional assessment, and the ability of the proposed mitigation to offset impacts to the aquatic environment"** (USEPA, 2006, p. 1). USEPA formally offered to help USACE to develop a stream functional assessment protocol.

Despite this attempt at continued cooperation, USACE issued the CWA Section 404 permit (199800436-3, Section 10) on January 22, 2007, authorizing the discharge of fill material from the Spruce No. 1 mine, effectively authorizing the commencement of mining on the site. Later that month, Mingo Logan Coal Co. began limited mining activities, and on January 30, 2007, several environmental groups, including the Ohio Valley Environment Coalition, filed suit against USACE for the issuance of the permit (OVEC v. USACE, 2005). While the suit unfolded in federal district court, Mingo Logan Coal Co. agreed to restrict its mining activities while it and the WVDEP modified the NPDES permit for Spruce No. 1 another seven times, totaling eleven different NPDES permit modifications by July 23, 2009.

As noted in USEPA's Proposed Determination published on April 2, 2010 (and described in detail in Section 3), Mingo Logan Coal Co. has, pursuant to the agreement with the plaintiffs, "been operating in a portion of the project in the Seng Camp Creek drainage area, including construction of one valley fill" associated with a limited amount of coal production. Additionally, USEPA notes that Mingo Logan, without objection from the plaintiffs, has expanded operations beyond the area of mining initially agreed upon (USEPA, 2010a). Since 2007, the Spruce No. 1 mine has produced 1.58 million tons of coal and employed an annual average of 24 miners (MSHA, 2010b).

2.6 September 2009 – March 5, 2010: inter-agency cooperation fails

Still unsatisfied with the permit, on September 3, 2009, USEPA formally issued a letter to USACE asking that Huntington District Director use discretionary authority to “suspend, revoke, or modify” the Spruce No. 1 mine permit. In the letter, USEPA highlighted the concern that the permit would degrade downstream waters and “contribute to potential excursions of West Virginia’s narrative water quality standards” (USEPA, 2009a, p. 1).

USEPA highlighted the recent evidence that valley fills are likely to “elevate conductivity and thus negatively affect healthy aquatic communities” (USEPA, 2009, p. 2). USEPA drew attention to the fact that the USACE’s final EIS included the assumption that high conductivity levels would be only temporary, a fact that was recently shown to be not “technically supportable” (USEPA, 2009, p. 2). Recent scientific evidence suggested that not only are elevated conductivity levels “persistent over time,” but also that they “cannot be easily mitigated” and “are strongly related to downstream biological impairment” (USEPA, 2009, p. 2). USEPA recommended that USACE consider this new information, suspend the permit, and prepare an additional EIS.

Demonstrating a renewed interest in MTR, Department of Justice lawyers intervened on behalf of the Obama administration, petitioning US District Judge Robert C. Chambers to allow USACE to revisit the Spruce No. 1 mine permit. Judge Chambers granted the request. However, on September 30, 2009, the USACE Huntington District Director released a statement responding to USEPA’s letter, expressing his refusal to halt the Spruce No. 1 mine permit. He addressed each of the four main concerns expressed by the September 3 letter from USEPA—fill minimization, water quality excursions and significant degradation, cumulative impacts, and compensatory mitigation—by referencing the permit’s history of revisions and modifications, and by consulting with WVDEP to ascertain whether Mingo Logan Coal Co. was currently in compliance. Concerning elevated conductivity levels, USACE added that USEPA’s comments on water quality “are not considered new information that would warrant revisiting the issue” (USEPA, 2009, p. 3), and concluded, “no additional evaluation of the project’s effects on the environment are warranted, the permit will not be suspended, modified, or revoked, and a supplemental EIS will not be prepared” (USEPA, 2009, p. 3).

At the conclusion of the first stay, on October 16, 2009, USEPA responded to USACE threatening to issue a Proposed Determination on Spruce No. 1, which would essentially veto the proposal. USEPA predicted that granting the Spruce No. 1 mine permit would probably result in “unacceptable adverse impacts to fish and wildlife resources” (USEPA, 2009, p. 1). Nothing significant happened after the initial delivery of the threat. Department of Justice lawyers stepped in to stay court proceedings, USEPA requested a stay of proceedings, and Judge Chambers granted these delays three times, effectively granting USEPA more time for a response. Finally, on March 5, 2010, Judge Chambers granted a final stay of proceedings and advised the USEPA to reach a final Proposed Determination.

2.7 March 26, 2010 – September 2010: USEPA proceeds with 404(c) veto process

On March 26, 2010, USEPA issued the landmark “proposed determination to prohibit, restrict or deny the specification, or the use for specification, of an area as a disposal site; Spruce No. 1 surface mine, Logan County, West Virginia” (USEPA, 2010a, p. 1). This is the first time since the CWA’s inception in 1972 that USEPA has initiated the process for using its veto power for a Section 404 permit. By vetoing USACE’s permitting of discharges into the Seng Camp Creek, Pigeonroost Branch, Oldhouse Branch, and tributaries in Logan County, USEPA will effectively prevent the majority of mining in the Spruce No. 1 permit area.

Following CWA procedure, USEPA issues the Proposed Determination and then conducts an investigative process that could result in a withdrawal of the permit, restrictions to the permit, or a declaration of permit sufficiency (USEPA, 2009c). The issuance of the Proposed Determination effectively reopened the EIS process to evaluate new information related to conductivity and narrative water quality standards, in addition to the information already contained in the final EIS. Following this landmark event, Judge Chambers further stayed the legal proceedings to allow time for public feedback on the Proposed Determination. At the conclusion of the public comment period and public hearings, more than 4,000 comments had been posted. Finally, on July 12, 2010, USEPA published in the Federal Register that it would delay a Recommended Determination until September 24, 2010.

2.8 Current status

Even though limited mining has commenced on the Spruce No. 1 permit area, and despite the fact that Mingo Logan Coal Co. has already begun filling the Seng Camp Creek of the Spruce Fork, USEPA has proceeded with exercising its veto authority under CWA Section 404(c).

The basics of the veto process and how it pertains to Spruce No. 1 mine are outlined below:

1. **Intent to issue Notice of Proposed Determination.** The USEPA Regional Administrator notifies USACE and the coal company of his/her intent to issue a public Notice of Proposed Determination to withdraw, prohibit, deny, or restrict the specification of a defined area for discharge of dredged or fill material.

In relation to the Spruce No. 1 mine, the Administrator for USEPA Region 3 provided notification of their intent in their letter to USACE dated October 16, 2009.

2. **Notice of Proposed Determination.** If the Regional Administrator is not satisfied that no unacceptable adverse effects will occur, a notice of the Proposed Determination is published in the Federal Register. The Notice of Proposed Determination begins the process of exploring whether unacceptable adverse effects will occur.

Following "extended discussions with [Mingo Logan Coal Co.]," which "failed to produce an agreement that would lead to a significant decrease of the environmental and health impacts of the Spruce No. 1 mine," (USEPA, 2010g, p. 1), USEPA Region 3 published its Proposed Determination in relation to the Spruce No. 1 permit on April 2, 2010 (USEPA published a press release announcing the Proposed Determination on March 26, 2010).

3. **Public Comment Period.** The publication of the Proposed Determination initiates a 30-60 day comment period in which interested stakeholders may submit comments related to the Proposed Determination. A public hearing on the Proposed Determination is normally held during the comment period.

For the Proposed Determination on the Spruce No. 1 mine, the comment period ended June 4, 2010, and a public hearing was held on May 18, 2010.

4. **Recommended Determination or Withdrawal.** The Regional Administrator prepares a Recommended Determination to withdraw, prohibit, deny, or restrict the specification of a defined area for disposing of dredged or fill material, and forwards it along with the administrative record to the USEPA Assistant Administrator for Water. Alternatively, the Regional Administrator withdraws the Proposed Determination.

USEPA Region III is expected to submit its Recommended Determination or notice of withdrawal by September 24, 2010.

5. **Corrective Action.** Within 30 days of receiving the Recommended Determination, the USEPA Assistant Administrator contacts USACE and the coal company and provides them with 15 days in which to take corrective action to prevent unacceptable adverse effects.

For Spruce No. 1, this time schedule—should the Region 3 Administrator submit the Recommended Determination as scheduled—means that USACE and Mingo Logan Coal Co. would have until November 9, 2010 to take corrective action.⁴

5. **Final Determination.** Within 60 days of receiving the Recommended Determination from the Region 3 Office, the USEPA Assistant Administrator affirms, modifies, or rescinds the Recommended Determination and publishes notice of the Final Determination in the Federal Register (USEPA, 2009c).

This schedule would result in the publication of USEPA's Final Determination by no later than November 23, 2010.⁵

In its Proposed Determination, USEPA describes the three possible outcomes of the 404(c) process for the Spruce No. 1 mine:

1. USEPA could withdraw specification of the site as a disposal site and decide to use its discretion to prohibit any discharges from the project, including the construction of valley fills;
2. USEPA could restrict specification of the site as a disposal site and decide the project cannot go forward under the permit as currently issued, but could go forward under a modified permit with more environmentally protective conditions; or,
3. USEPA could decide the permit as currently issued is sufficiently protective (USEPA, 2009c)

⁴ This step in the process may have already occurred. USEPA published their 404(c) Proposed Determination for the Spruce No. 1 mine on April 2, 2010. In the document, the Region 3 Administrator notes that his/her office had taken this step following a failure of Mingo Logan Coal Co. to respond to USEPA's request that the company take corrective action to sufficiently reduce and mitigate the potential impacts from the Spruce No. 1 mining operation. However, it is possible that USEPA Headquarters may offer USACE and Mingo Logan a second opportunity at corrective action before USEPA produces a Final Determination.

⁵ USEPA Region 3 notes that this deadline may be extended should the agency require more time to produce the Final Determination.

3. USEPA'S PROPOSED DETERMINATION FOR THE SPRUCE NO. 1 MTR MINE: ANALYSIS AND RECOMMENDATIONS

3.1 Background

In the September 3, 2009 USEPA letter to the Huntington District of USACE requesting that the agency "use its discretionary authority provided by 33 CFR 325.7 to suspend, revoke, or modify the permit," USEPA argues that new information and data have become available since issuance of the permit in January 2007 that justified reconsideration of the permit.

USEPA's concerns about the Spruce No. 1 permit as expressed in the September 3 letter were that:

1. "Recent data and analyses have revealed that downstream water quality impacts have not been adequately addressed by the permit, **especially in light of clear evidence that effluent from valley fill sedimentation ponds is very likely to elevate conductivity and thus negatively affect healthy aquatic communities.**
2. Studies on water quality impacts of surface mining with valley fills, together with information currently available regarding impairments of streams within the Spruce No. 1 mine project area, strongly suggest that further water quality degradation and water quality exceedances may occur as a result of new mining activities at Spruce No. 1 Mine.
3. The project's consistency with the data and assumptions underlying Total Maximum Daily Load's (TMDL's) approved in 2006 requires further investigation (because) there is a strong likelihood that the project may cause or contribute to a violation of [West Virginia's] water quality standards or anti-degradation policy.
4. The use of sediment ditches as compensation for lost headwater stream channels is an unacceptable method of mitigating stream loss, as the channels are often only evaluated for success utilizing structural performance criteria and not incorporating biological and chemical performance criteria to ensure success. Without ensuring that restored or created streams provide chemical, physical, and ecological functional replacement for streams, "these channels will only serve as conduits for pollutants from the site to downstream waters...[and] **It is unlikely that the proposal as permitted will achieve functional replacement**" (USEPA 2009a, p. 3, emphasis added).

In that initial letter, USEPA recommended that USACE revisit the permit and include in their review:

1. "[Consideration of] additional valley fill minimization techniques, including further backstacking of material on-site where appropriate, the inclusion of sidehill fills with stream relocations, or other design modifications to ameliorate water quality impacts;
2. Consideration of impacts individually and cumulatively, [given that] there is new evidence of potentially significant cumulative impacts within the [Spruce Fork] sub-watershed, and even within the [Coal River] sub-basin, due to mining activities;
3. A more comprehensive and robust cumulative impacts analysis consistent with the requirements of the [CWA] Guidelines and National Environmental Policy Act...given the extent of past, present, and proposed future mining activities within the Coal River sub-basin; and
4. Re-evaluation of the mitigation plan to ensure the achievement of functional replacement of lost aquatic resources...given the available research, data, and information illustrating the

potential for significant cumulative impacts associated with surface mining and valley fills” (USEPA, 2009a, p. 3).

USEPA also recommended that USACE require a new, supplemental EIS that incorporates and considers all new information and data pertaining to the full extent of potential impacts that would result from the operation of the Spruce No. 1 MTR permit.

USACE responded by stating that “there are no factors that currently compel [USACE] to consider permit suspension, modification, or revocation,” and, more specifically, that:

“[USACE] has determined that there were no other practicable alternatives that would have less impacts on the aquatic environment, the proposed discharge would not be expected to cause or contribute to violations of applicable state water quality standards or significant degradation of the environment, and all appropriate steps were taken to minimize potential adverse impacts... Therefore, [USACE] has determined that no additional evaluation of the project’s effects on the environment are warranted, the permit will not be suspended, modified, or revoked, and a supplemental EIS will not be prepared” (USACE, 2009).

In its October 16, 2010 response letter to USACE, USEPA expressed its continued concern “with much of the analysis set forth in the USACE September 30 letter, particularly as it relates to the potential for adverse water quality impacts, further avoidance and minimization measures, the potential for cumulative impacts, and the identification and enforceability of success criteria for [stream] mitigation” (USEPA, 2009b). Citing “very serious concerns” regarding the scale and extent of significant environmental and water quality impacts associated with the Spruce No. 1 mining operation—described in more detail below—USEPA initiated the CWA Section 404(c) veto process described above in Section 2.8. The following sections provide further detail on USEPA’s Basis for Proposed Determination, including its assessment of the potential impacts from the Spruce No. 1 mine and concerns pertaining to those impacts.

3.2 USEPA’s Basis for Proposed Determination in relation to Spruce No. 1

USEPA’s regulations for implementation of Section 404(c) authority “make clear that the Administrator may exercise a veto over the specification by [USACE] or by a state of a site for the discharge of dredged or fill material” (40 CFR 231.1(a), as cited in USEPA, 2010a). USEPA may initiate the veto process even after a permit has been issued, as is the case with the Spruce No. 1 permit. As noted in its Proposed Determination, the CWA requires that use of final 404(c) veto authority be based on a determination of “unacceptable adverse effect” to municipal water supplies, shellfish beds, fisheries, wildlife, or recreational areas (USEPA, 2010a, p. 21). The Proposed Determination details USEPA regulations associated with CWA Section 404 guidelines that are “particularly important in evaluating the unacceptability of environmental impacts” that would result from the Spruce No. 1 mine. As detailed in the following sections, these are:

1. Less environmentally damaging practicable alternatives,
2. Impacts to water quality,
3. Significant degradation of waters of the US,
4. Minimization of adverse impacts to aquatic ecosystems,
5. Impacts on existing indigenous aquatic organisms or communities,
6. Cumulative effects, and

7. Secondary effects (40 CFR 230.10(a-e, g), as cited in USEPA, 2010a, p. 21).

3.3 Adverse impacts of the proposed project

In providing background justification for its actions pertaining to the Spruce No. 1 Proposed Determination, USEPA explains that “an understanding of the adverse impacts of the proposed project requires an understanding of the nature and importance of headwater streams and their contribution to the overall health of the watershed and to wildlife living in the watershed. Headwater streams play a significant role in the ecology of the Appalachian region...The benefit of healthy headwaters are cumulative as the critical ecological functions of many small streams flowing into the same river system are necessary to maintain ecological integrity of the larger stream and river systems. Ecosystem functions performed by headwaters are lost when the headwater stream is buried or removed. These functions are lost not only to the headwater stream itself, but also to downstream ecosystems” (USEPA, 2010a, p. 22)

In relation to the Spruce No. 1 mine, USEPA asserts that the mine would not only eliminate the ecosystem functions performed by the impacted forests and streams, but would also convert those areas into sources of pollutants and downstream degradation. That assertion was informed by a comparison of Spruce No. 1 to other MTR operations in the Coal River sub-basin, including the Mingo Logan Dal-Tex mine immediately to the northwest. USEPA asserts, as supported by the Spruce No. 1 EIS, that the impacts from Spruce No. 1 “are likely to be similar to those caused by the Mingo Logan Dal-Tex operation” (USEPA, 2010a, p. 23).

Concluding, USEPA states that, unless the permit is modified, “the predicted impacts from the Spruce No. 1 mine, if constructed as currently authorized, could have unacceptable effects on wildlife and fisheries. **Consistent with the agency’s regulations, EPA has given consideration to the relevant portions of the Guidelines and we also believe that the project is inconsistent with the 404(b)(1) Guidelines**” (USEPA, 2010a, p. 23).

3.3.1 *Impacts to wildlife and fisheries*

USEPA grounds potential impacts to wildlife and fisheries in the loss of the headwater streams of Right

the Spruce Fork of the Little Coal River. This loss will eradicate wildlife that live in those streams within the footprint of the valley fills. These wildlife may include ecologically valuable aquatic organisms such as macroinvertebrates and salamanders. USEPA notes that the impact on the headwater streams may cause permanent loss of ecosystems, affecting ecological processes downstream, including nutrient cycling and the provision of species diversity. Additionally, USEPA notes that the loss of Pigeonroost Branch and Oldhouse Branch as sources of freshwater dilution, in combination with the discharge of contaminants from the valley fills, “could adversely affect downstream water chemistry, which in turn could have an adverse impact on aquatic and water-dependent wildlife” (USEPA, 2010a, p. 23). Finally, USEPA asserts that the destruction of 2,278 acres of highly biodiverse deciduous forest associated with the mining could have adverse effects on terrestrial wildlife, while eliminating the services the forests provide to the overall ecosystem.

Further detail on impacts of the proposed mining on freshwater macroinvertebrates, salamanders, fish, birds, and bats is provided in the Proposed Determination, as well as an explanation of how impacts to each of these wildlife categories could result in subsequent impacts on the others, and on the ecosystem as a whole.

3.3.2 *Impacts to water quality*

Regarding water quality, USEPA states that “adverse changes in water chemistry frequently have a corresponding impact on wildlife and fisheries that live in or depend upon the water,” and because “the 404(c) regulations require consideration of whether the project would violate other environmental standards, including applicable water quality standards” (USEPA, 2010a, p. 30). The two impacts to water quality and chemistry detailed in the Proposed Determination include those associated with selenium and with total dissolved solids (TDS), which are correlated with the conductivity of streams.

In relation to selenium, USEPA asserts that discharges from Spruce No. 1 will likely increase the selenium concentration in waters downstream from the mine, and notes that excessive amounts of selenium can have toxic effects, including birth defects, abnormal development, or death for fish and other aquatic life. USEPA notes that elevated selenium concentrations in fish eggs, increased larval deformity rates, and increased deformity rates in mature fish are associated with elevated water column selenium, **indicating unacceptable adverse effects on fisheries**, and that sedimentation ponds used for treating mine discharges are generally not effective in removing selenium from those discharges (USEPA, 2010a, p. 31, emphasis added).

Citing exceedances of West Virginia’s numeric water quality standard for selenium within the Coal River sub-basin and Spruce Fork sub-watershed, as identified by WVDEP, USEPA concludes that disturbance of the geology within the Spruce No. 1 mine area is likely to result in the release of selenium during mining. USEPA further cites WVDEP, which reports that coal seams in the vicinity of the Spruce No. 1 permit have some of the highest selenium concentrations. Discharges from mines in these seams have chronically exceeded state selenium numeric water quality standards. In addition, NPDES discharge monitoring reports show that the valley fill being constructed in Seng Camp Creek as part of the Spruce No. 1 mining operation has been discharging selenium at levels exceeding the state numeric water quality standard.

USEPA concludes that “these data strongly suggest that the Spruce No. 1 mine is likely to cause exceedances of the Selenium water quality criterion and lead to significant degradation of water quality” and that the mine “has the potential to cause or contribute to discharges of selenium that could cause unacceptable adverse impacts to fish and wildlife resources” (USEPA, 2010a, p. 31).

In relation to TDS and conductivity, USEPA asserts that discharges from the Spruce No. 1 mine “are likely to include high levels of total dissolved solids, which will increase instream specific conductivity downstream of the project and adversely affect the naturally occurring aquatic communities” by causing acute toxicity in native aquatic organisms, and possibly even supporting the growth of toxic golden algae (USEPA, 2010a, p. 32-34). According to USEPA, conductivity is a strong indicator of the mixture of ions in a stream, and is a good predictor of aquatic life use impairment. **Importantly, “increases in conductivity impair aquatic life use, are persistent over time, and cannot be easily mitigated or removed from streams”** (USEPA, 2010a, p. 32).

USEPA notes that natural waters in the Spruce No. 1 project area—such as Pigeonroost Branch and Oldhouse Branch—have very low conductivity (50-100 $\mu\text{S}/\text{cm}$), as well as very low TDS, and are considered fresh water resources. Thus, these streams help prevent conductivity levels in Spruce Fork from being elevated above current levels. On the other hand, mine drainage from the Dal-Tex mine have resulted in elevated conductivity levels. Samples taken from Rockhouse Creek show an average

2,426 $\mu\text{S}/\text{cm}$. Figure 1 shows the location of each of these four streams in relation to the Dal-Tex and Spruce No. 1 permit areas.

Strong scientific evidence indicates which levels of conductivity are likely to protect aquatic life, and, according to USEPA, these data can be used to predict effects from Spruce No. 1. As a result of that research, USEPA has set maximum conductivity limits for streams below proposed surface mines and valley fills at 500 $\mu\text{S}/\text{cm}$, the level at which there is an identified high probability of impairment to the biological community. USEPA notes also that the level at which conductivity can be ruled out as a possible stressor to aquatic life is 327 $\mu\text{S}/\text{cm}$, and has thus set a target water quality standard for Appalachian streams at 300 $\mu\text{S}/\text{cm}$.

Overall, water samples from Spruce Fork show that average conductivity in the mainstem of Spruce Fork is as much as ten times the natural levels expressed in unimpacted streams such as Oldhouse Branch, and that the average conductivity at almost every monitoring site exceeded 500 $\mu\text{S}/\text{cm}$. However, conductivity values for several streams draining the proposed Spruce No. 1 mine site currently indicate excellent water quality, and that “discharges from valley fills into Pigeonroost Branch and Oldhouse Branch would both remove sources of freshwater dilution to Spruce Fork and create new sources of TDS and conductivity” (USEPA, 2010a, p. 34).

3.3.3 ***Proposed mitigation may not offset anticipated impacts to an acceptable level***

USEPA describes compensatory mitigation as involving “actions taken to offset unavoidable adverse impacts to wetlands, streams, and other aquatic resources authorized by [CWA] Section 404 permits and other [USACE] permits” (USEPA, 2010a, p. 36). In relation to the Spruce No. 1 mine, while recognizing the existence of a mitigation plan proposed by Mingo Logan and approved by USACE, USEPA asserts that **“the quality and function of the impacted resources were not appropriately assessed and accounted for in the mitigation plan...[and] EPA is therefore concerned that the mitigation proposed for the Spruce No. 1 project may not offset the anticipated impacts to an acceptable level”** (USEPA, 2010a).

Additionally, USEPA is concerned that:

1. The proposed mitigation underestimates impacts to perennial and intermittent streams by misclassifying them, resulting in an insufficient baseline for designing adequate stream compensation.
2. The approved delineation of stream-types in the project area may not accurately reflect the stream-types exhibited on-site.
3. The proposed valley fills will likely impact a greater quantity (by thousands of feet) of intermittent and perennial stream channels than is proposed to be compensated by the project’s Compensatory Mitigation Plan (CMP).
4. The calculation of (stream) debits (losses) and credits (additions or restorations) calculated using the Stream Habitat Method as presented in the Spruce No. 1 CMP inadequately quantifies the mitigation needed for the project, as it only accounts for the physical aspects of stream condition and completely ignores the interrelationship of water chemistry and biological resources in stream functioning; as such, the mitigation plan does not meet the requirements of a “functional” assessment, as is required for developing a sufficient and acceptable CMP (USEPA, 2010a)

USEPA concludes that the Spruce No. 1 CMP is “unlikely to sustain the biological, chemical, and physical characteristics of the affected streams” because it “fails to recognize the true functioning of

healthy headwater streams and so therefore fails to replace the streams' lost ecological services," and because "the planned control structures are waste treatment systems designed to control poor quality waters and then convey those waters offsite" (USEPA, 2010a, p. 38). **Most importantly, USEPA asserts that "the adverse impacts associated with the Spruce No. 1 project as authorized, are not adequately offset by the CMP and as such...the project may have unacceptable adverse impacts to fish and wildlife resources..."** (USEPA, 2010a).

3.3.4 *Cumulative impacts from Spruce No. 1*

For background purposes, it is useful to re-state that the direct and indirect individual impacts to land and streams that would result from Spruce No. 1 include:

1. The loss of 2,278 acres of high biodiversity, ecologically significant Appalachian hardwood forest,
2. A direct and permanent impact of nearly 7.5 miles of valuable headwater streams as a result of the construction of six valley fills,
3. Indirect impacts to Spruce Fork and potentially other downstream waters in the Coal River sub-basin, with such impacts including, at a minimum, discharges of pollutants from valley fills such as TDS and selenium, and the removal of sources of freshwater dilution currently provided by Pigeonroost Branch and Oldhouse Branch.

Perhaps the most important issue in relation to the Spruce No. 1 MTR mine and USEPA's authority to utilize the Section 404(c) veto process relates to how the individual impacts resulting from Spruce No. 1 would cause or contribute to cumulative adverse environmental effects. The case for arguing that the mine would indeed result in adverse environmental effects is strengthened by the fact that the land and streams lying within the Spruce Fork sub-watershed, the Little Coal River sub-watershed into which the Spruce Fork and its tributaries flow, and the broader Coal River sub-basin have all been or are expected to be significantly impacted by historical and extant permitted surface mining operations and their associated valley fills. The decision being made on the Spruce No. 1 mining permit hinges on a consideration of these existing cumulative impacts, and on how the proposed Spruce No. 1 mine will contribute to further degradation of the Spruce Fork ecosystem.

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7, as cited in USEPA, 2010a, p. 42). It is mandatory for USACE to consider, during its review of mining permits, the individual and cumulative impacts on "conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people" (33 CFR 320.4(a), as cited in Bragg v. Robertson, 2005, p. 6).

Additionally, "cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7, as cited in Bragg v. Robertson, 2005, p. 8). Cumulative actions are actions "which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement" (40 CFR 1508.25 (a)(2), as cited in Bragg v. Robertson, 2005, p. 8, emphasis added). Federal code clarifies that "significance exists if it is reasonable to anticipate a cumulatively significant impact on the

environment,” and “significance cannot be avoided by terming an action temporary or by breaking it down into small component parts” (40 CFR 1508.27(b)(7), as cited in Bragg v. Robertson, 2005, p. 8).

Existing impacts to the Coal River sub-basin, the Little Coal River watershed (a component of the Coal River sub-basin), and the Spruce Fork sub-watershed (which drains into the Little Coal River watershed) are substantial, and the concentration of cumulative impacts increases as the area of analysis decreases. The Coal River sub-basin currently has 743 miles of streams listed as impaired for selenium and biological impairment, representing 30% of the streams within the sub-basin, and USEPA asserts that the character of the impairment indicates a strong relationship between mining and watershed quality (USEPA, 2010a, p. 43). The direct stream impacts from Spruce No. 1 alone would increase the cumulative impact to the Coal River sub-basin by approximately 1%; the indirect impacts would only add to that.

Also, there are eleven additional mining projects proposed within the Coal River sub-basin, including four projects under consideration within the enhanced coordination review process established in the June 2009 MOU. These eleven projects would impact 29.4 miles of stream channels, resulting in additional stream impairments within the sub-basin (USEPA, 2010a, p. 44). There are six other permits authorized by USACE, for which work has not yet commenced due to ongoing litigation, and one new proposal that has been submitted to USACE (USACE, 2009).

The Little Coal River watershed within the Coal River sub-basin—which contains the largest number of impaired streams in the Central Appalachian Ecoregion in West Virginia—has 98 miles of impaired streams, representing 33% of the streams in the watershed. The majority of these impacts have occurred in the Spruce Fork sub-watershed—shown outlined in blue in Figure 5—which spans an area of approximately 126 square miles. The watershed also consists of approximately 286 total miles of streams.

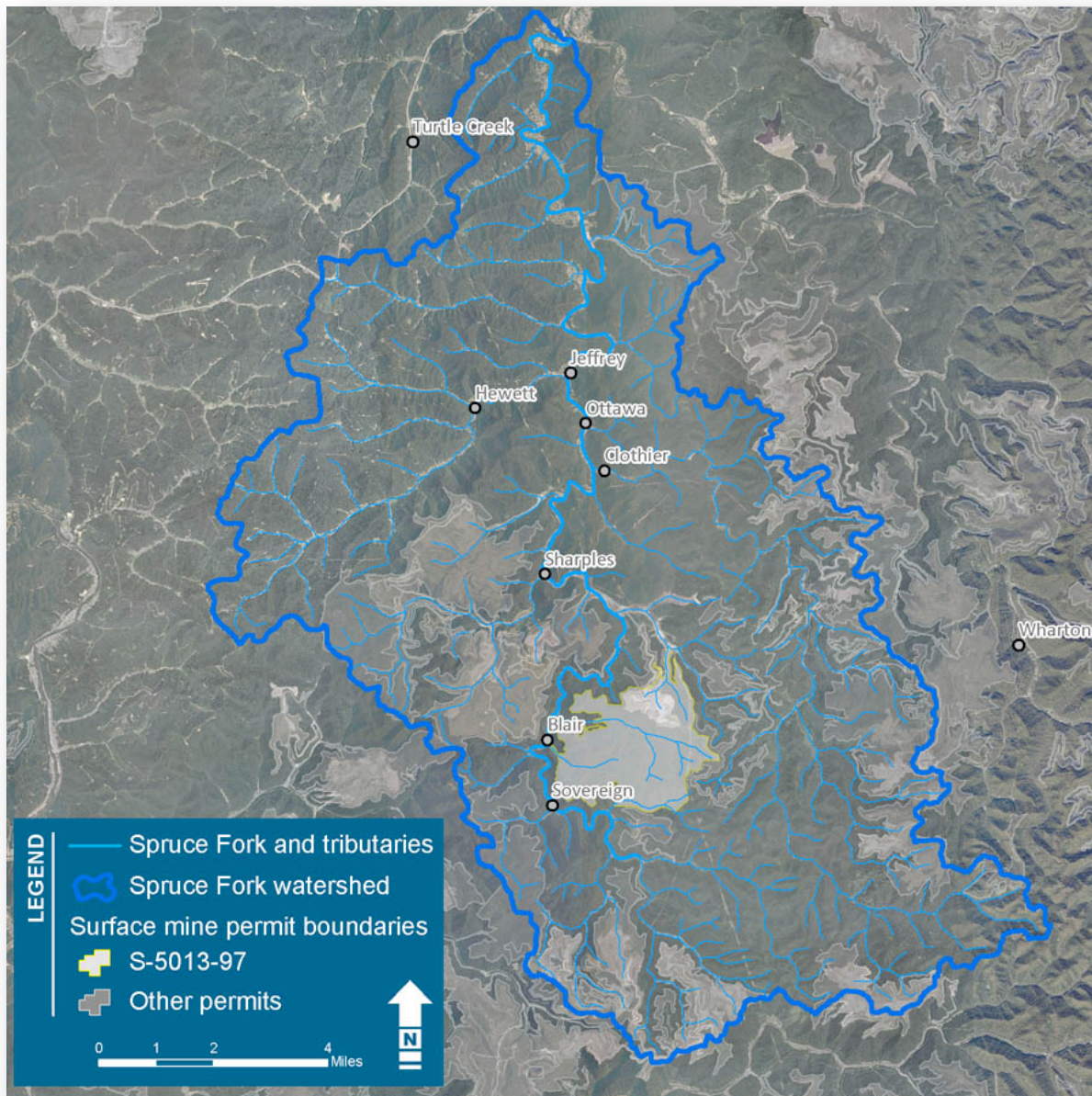
A GIS analysis conducted for this report shows that historical and permitted surface mining operations, by the time all permitted mining is completed, will have directly and permanently impacted—or filled—over 53 miles of streams, for a total cumulative impact of 19% of the Spruce Fork sub-watershed (see Figure 5). Twenty-six streams within the sub-watershed, including Seng Camp Creek (currently being filled with mine spoil), have been listed as biologically impaired. The Spruce No. 1 mine would increase the cumulative impact by 18% to 63 total miles of stream lost (including impacts from sedimentation ponds), amounting to 22% of the watershed (USEPA, 2010a, p. 43). These additional impacts would affect Pigeonroost Branch and Oldhouse Branch, which are not listed for water quality impairments and may be providing clean freshwater dilution to Spruce Fork, which, as described, has measured conductivity readings above 500 $\mu\text{S}/\text{cm}$.

In terms of forest loss, loss of wildlife habitat, and cumulative impacts to watershed drainage areas, USEPA notes that numerous studies have demonstrated that the Central Appalachian Ecoregion is losing ecologically valuable forest at a significant pace, largely due to surface mining. USEPA notes that more than 257 past and present surface mining permits have been issued within the Coal River sub-basin that collectively occupy more than 13% of the land area.

“Within the Headwaters Spruce Fork sub-watershed alone, more than 34 past and present surface mine permits have been issued which collectively occupy more than 33% of the land area” (See Figure 5) (USEPA, 2010a, p. 43). Therefore, any additional forest loss associated with the Spruce No. 1 mine would add to the cumulative impacts on forest and wildlife habitat, as well as on water quality within the headwaters and downstream of the Spruce Fork sub-

watershed. As described in the summary of USEPA's Proposed Determination below, the existing and potential cumulative impacts to each of the three levels of watersheds, particularly the Spruce Fork sub-watershed, provide cause for concern that the discharge of dredged or fill material associated with the Spruce No. 1 mine would result in additional adverse environmental effects to wildlife and aquatic resources.

Figure 5: Cumulative impact on the Spruce Fork sub-watershed from historical and permitted surface mines and Spruce No. 1



3.3.5 ***“Secondary effects”: environmental justice concerns***

USEPA defines environmental justice (EJ) as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA, 2010a, p. 41), and expresses concern that EJ issues were not adequately addressed in the final EIS for the Spruce No. 1 mine.

USEPA explicitly recognizes that “surface coal mining can have adverse environmental and health impacts on neighboring communities,” and notes that federal statutes and regulations require, in the consideration of surface mine permits, “consideration of the full range of potential impacts on the environment, human health, and communities,” particularly low-income or minority populations. USEPA further recognizes that federal laws and regulations “also require that meaningful opportunities be provided for public participation in the permit decision-making process” (USEPA, 2010h, p. 6). In relation to these considerations, USEPA committed in its April 1, 2010 guidance memorandum to working with other federal permitting agencies and the states to “identify and address the potential adverse human health and environmental effects of proposed projects on low-income and minority populations,” and to “ensure that the decision making process is more transparent, with increased opportunities for meaningful community input and broad access to information” (USEPA, 2010h, p. 6).

In the April 1 memorandum, USEPA asserts that, to determine whether an agency’s action raises EJ concerns, the permitting agency should consider whether there will be “disproportionate impacts on minority, low-income, or indigenous populations” (USEPA, 2010h, p. 7). “Disproportionate impacts” could be caused by any combination of the following factors: proximity and exposure to environmental hazards; prevalence of susceptible populations, unique exposure pathways, and multiple and cumulative effects; ability (or inability) to participate in the decision-making process; and properties of the physical infrastructure.

In relation to the Spruce No. 1 mine, USEPA notes that the mine is located in a Census block group where the per capita income is roughly half that of the national average and \$6,000 less than the West Virginia state average. Additionally, according to USEPA, 24% of the residents of Logan County live below the poverty line, which also exceeds state and national averages (USEPA, 2010a). Research conducted for this report on the socioeconomic conditions of Logan County, and presented in Section 1.2.2, were similar to those reported by USEPA, which concludes that “additional analysis of the potential for disproportionately high and adverse effects on the low-income populations (in the vicinity of the Spruce No. 1 mine) needs to be conducted” (USEPA, 2010a, p. 42).

USEPA asserts that additional consideration must be given to:

1. the conditions nearby residents face in association with the proposed mining operation, including proximity to blasting, locations of valley fills, truck traffic, noise, fugitive dust, and habitat loss;
2. the mining activities’ potential impacts on opportunities for and access to subsistence fishing, hunting, foraging, and gardening (USEPA, 2010a, p. 42);
3. potential impacts on sources of drinking water for the affected populations, including municipal water supplies and private sources such as streams and/or wells; and,
4. the cultural impacts of the destruction of the mountains and the various resources and uses made available by the mountains.

Such considerations are past due. In July 1998, when representatives of Hobet Mining, an Arch Coal subsidiary that was operating the Dal-Tex operations just to the northwest, began visiting residents of

Blair and other towns along Pigeonroost Hollow, many residents had already moved out of the area due to the blasting, dust, and noise from mining at the Dal-Tex complex. In addition, company officials had offered to buy out many of the remaining residents (Ward, 1998).

One resident, James Weekley, who along with his wife (until she passed away) has opposed the Spruce No. 1 mine since it was first proposed, was visited at his home by an Arch Coal official in July 2008. Referring to the potential mining on Spruce No. 1, Mr. Weekley pleaded with the official, saying "When you come in here and do this, all I'm going to have left are memories...Money can't buy my memories. Look at all the species of trees and plants that are going to be destroyed. Why? Why? Why?" To which the official responded, **"The reason, Mr. Weekly, is that we have a resource that is valuable and that the market wants. That is coal."** (Ward, 1998).

The towns closest to the proposed mine include Five Block, Spruce Valley, Blair, Sovereign, and Kelly. Census block data from 2000 show that approximately 355 residents lived directly adjacent to or within the boundaries of the Spruce No. 1 permit area. As a result of the mining, the associated conversion of forestland to mined land, and associated stream loss and sediment build-up in the remaining streams, the towns of Blair, Spruce Valley, and Five Block, in addition to the towns of Sharples and Dobra downstream of the mine, would all be at greater risk of rapid and severe flooding events, such as those that occurred in Island Creek on the western side of Logan County in 1996 and 2004.

3.4 Proposed Determination

Based on the information detailed in the Proposed Determination by the Region 3 Administrator, the Administrator asserts, or has "reason to believe," that the Spruce No. 1 MTR mine "as currently authorized" could result in "unacceptable adverse impacts" that can only be reduced or avoided through the modification of the project in a manner that addresses USEPA's various concerns pertaining to the proposed operation.

Given the lack of willingness by USACE and Mingo Logan Coal Co. to take corrective action to address USEPA's concerns, the Region 3 Administrator "proposes to recommend that the discharge of dredged or fill material to Pigeonroost Branch and Oldhouse Branch for the purpose of constructing the Spruce No. 1 Surface Mine as currently authorized (by USACE) be prohibited or restricted" (USEPA, 2010a, p. 41).

As noted in the document, the Proposed Determination is based on "unacceptable adverse impacts to wildlife pursuant to Section 404(c)," as associated with impacts to water quality that would result from the proposed dredge and fill activities. Further, USEPA believes that the project would "cause or contribute to significant degradation of waters of the [US] and violate Section 404(b)(1) Guidelines," by burying wildlife in headwater streams through the construction of valley fills, eliminating habitat upon which all wildlife depends, removing functions performed by buried resources, and transforming the buried areas into sources that may contribute pollutants to downstream waters (USEPA, 2010a, p. 41). Each of these factors will likely result in negative effects on downstream waters and wildlife. In addition, USEPA concludes that the project may "contribute to conditions that would support blooms of golden algae that release toxins that can kill fish and other aquatic life," and that "there will also be an effect from deforestation of the project site on terrestrial wildlife." Finally, and perhaps most importantly, "impacts from the project could contribute to cumulative impacts from multiple surface mining activities in the Coal River sub-basin," and, more specifically, in the Spruce Fork sub-watershed (USEPA, 2010a, p. 41).

4. SUMMARY AND CONCLUSIONS

“That it is necessary in this circumstance to initiate Section 404(c) review reflects the magnitude and scale of anticipated direct, indirect, and cumulative adverse environmental impacts associated with this mountaintop removal mining operation—the largest strip mining operation ever proposed in Appalachia when it was first permitted by the Corps” (USEPA, 2009b, p. 2)

As described by USEPA, the Spruce No. 1 MTR coal mine, in Logan County, West Virginia, would be one of the largest MTR mines ever proposed in Central Appalachia. In addition, the mining and associated valley fills would impact the Coal River watershed, where many streams have already been significantly impacted by past mining activities. For these reasons, the permit has also been one of the most contested, for the potential human and environmental impacts of the mining operation and its associated valley fills would be substantial and irreversible.

First proposed as a 3,113-acre mine in 1997 by Hobet Mining, a subsidiary of St. Louis, Missouri-based Arch Coal, the mine has faced legal and regulatory challenges leading to numerous revisions of its associated permits, and has had an EIS conducted that examined the full range of potential impacts and analyzed various alternatives to the proposed mining plan. As a result, the scale and potential impacts of the mine have been reduced, although they remain substantial: 2,278 acres, six valley fills, and direct impacts to 7.5 miles of stream channels. Despite the reduction, USEPA wrote that it “remained concerned about the project’s potential contribution to cumulative impacts [from surface mining operations]...[the] methods used for functional stream assessment, and the ability of the proposed mitigation to offset impacts to the aquatic environment” (USEPA, 2006, p. 1). Ignoring USEPA’s concerns, USACE proceeded to approve the permit on January 22, 2010.

Since then, new information on the potential impacts from the Spruce No. 1 mine, and emerging research on the human and environmental impacts of MTR and valley fills in general, has prompted USEPA to take stronger action against the proposed permit. Following a series of requests to USACE and Mingo Logan Coal Co.—the current permittee—that they revise and/or modify the permit in a manner that addresses USEPA’s concerns, USEPA has exercised its authority under CWA Section 404(c) and, on April 2, 2010, published its Proposed Determination “to prohibit, restrict, or deny the specification, or the use for specification, of an area as a disposal site” for dredged or fill material (construction of valley fills) associated with the operation (USEPA, 2010a, p. 1). The areas in question include the Pigeonroost Branch, Oldhouse Branch, and Right Branch of Seng Camp Creek, which serve as headwaters of the Spruce Fork of the Little Coal River.

The USEPA Region 3 Administrator is expected to submit his/her Recommended Determination on September 24, 2010. USEPA has given no indication on whether its recommendation will be to prohibit, restrict, or deny specification of the proposed sites as suitable for valley fill construction, or whether it will withdraw its Proposed Determination altogether.

Based on the information on Spruce No. 1 mine and its potential impacts on the environment and nearby communities, we recommend that USEPA, in its Final Determination deny specification of Pigeonroost Branch, Oldhouse Branch, and the yet-to-be impacted portions of Seng Camp Creek as sites suitable for receiving dredged and/or fill material in association with the proposed mining operation.

We recommend this action because the mining permit, as proposed, violates USEPA’s guidance as published on April 1, 2010. USEPA’s guidance memorandum states that when Regional Offices review permit applications, they should verify that the permit is consistent with CWA

statutes and USEPA regulations. The following provides an explanation of the applicable guidelines from USEPA's memorandum, as well as an analysis of how the Spruce No. 1 permit violates each guideline:

1. *Mining activities will not cause or contribute to violations of water quality standards, contaminate drinking water supplies, or add toxic pollutants that kill or impair stream life.*

The USEPA Proposed Determination details various ways that the Spruce No. 1 permit would violate this guideline. These include elevated conductivity levels (above the proposed maximum of 500 $\mu\text{S}/\text{cm}$) and TDS in the receiving streams and downstream waters, discharge of toxic levels of selenium, and possible promotion of conditions that would support the growth of toxic golden algae. Each of these potential impacts would, in USEPA's own words, "cause or contribute to significant degradation of water quality" and have "unacceptable adverse impacts [on] fish and wildlife resources" (USEPA, 2010a, p. 31).

2. *Applicants have evaluated a full range of alternatives to discharging into waters of the US.*

USACE is required to review proposed alternatives set forth in mining permits and to require the permittee to revise the permit should USACE determine that the chosen alternative would have unacceptable adverse effects on waters of the US. USACE argues that the approved mining plan serves as the best available alternative to the original proposal given the full range of required considerations. USEPA has concluded, however, that USACE erred in its determination that the chosen alternative—the current mining plan—would not have unacceptable adverse effects.

3. *Mining companies have avoided and minimized their direct, indirect, and cumulative environmental impacts to streams, wetlands, watersheds, and other aquatic resources.*

As noted in USEPA's guidance memorandum, mining projects with multiple valley fills "will generally raise serious questions about their compliance with CWA regulations and may require permit objection" (USEPA, 2010f, p. 4). There are six valley fills proposed for Spruce No. 1.

To ensure that permitted valley fills adhere to this guideline, USEPA requires that the permit "demonstrate compliance with applicable water quality standards," and that "there is no significant degradation associated with the first valley fill before the permittee may begin construction of subsequent fills" (USEPA, 2010f, p. 5). However, the Proposed Determination notes that NPDES discharge monitoring reports show that the valley fill being constructed in Seng Camp Creek as part of the Spruce No. 1 mining operation has been discharging selenium at levels exceeding the state numeric water quality standard. USEPA also concludes that the loss of Pigeonroost Branch and Oldhouse Branch as sources of freshwater dilution, in combination with the discharge of contaminants from the valley fills, "could adversely affect downstream water chemistry, which in turn could have an adverse impact on aquatic and water-dependent wildlife" (USEPA, 2010a, p. 23).

Therefore, based on the failure of the Seng Camp Creek valley fill to comply with applicable water quality standards alone, USEPA must deny the designation of Pigeonroost Branch and Oldhouse Branch as disposal (valley fill) sites, based on its own guidance.

Perhaps of greatest importance for consideration in determining the permit's ability to meet this guideline are the existing and potential cumulative impacts of surface mining and Spruce No. 1 on the Spruce Fork sub-watershed, the Little Coal River watershed, and the Coal River sub-basin, as described in Section 3.3.4 of this report, and in even greater detail in the Proposed Determination. It is important to note that reducing the potential impacts of a proposed mine does

not equate to a reduction of cumulative impacts. Although reducing potential impacts of a proposed mine indeed equate to a reduction of cumulative impacts compared to those which would have resulted if the mine were not reduced, it is still true that any new mining adds to existing and historical impacts of past and present mining operations, thereby contributing to cumulative impacts resulting from surface mining operations in a given area or watershed.

Even putting aside the potential contributions from Spruce No. 1, USEPA's recognition of the scale of existing cumulative impacts of past surface mining operations in the Spruce Fork and Coal River watersheds requires that USEPA deny specification of Pigeonroost Branch and Oldhouse Branch as suitable sites for the construction of valley fills. The contributions from Spruce No. 1, while in themselves significant, are small compared to the cumulative impacts that have resulted from past mining alone.

4. *Remaining mining-related aquatic impacts have been effectively mitigated by establishing, restoring, enhancing, or preserving streams and wetlands.*

In relation to the mitigation of mining impacts, USEPA guidance states that “unavoidable mining-related environmental impacts must be effectively mitigated by establishing, restoring, enhancing, or preserving streams and wetlands; improving water quality; addressing drinking water impacts; and reclaiming watersheds when mining is completed” (USEPA, 2010f, p. 5). To ensure effective mitigation, permit applicants should conduct functional stream impact assessments that include biological parameters as well as traditional water quality parameters, and ensure that these assessments are effectively used to quantify the environmental effects of individual mining projects on streams.

USEPA concludes that the Spruce No. 1 CMP is “unlikely to sustain the biological, chemical, and physical characteristics of the affected streams” because it “fails to recognize the true functioning of healthy headwater streams and so therefore fails to replace the streams’ lost ecological services,” and because “the planned control structures are waste treatment systems designed to control poor quality waters and then convey those waters offsite” (USEPA, 2010a, p. 38). Most importantly, USEPA asserts that “the adverse impacts associated with the Spruce No. 1 project as authorized are not adequately offset by the CMP and as such...the project may have unacceptable adverse impacts to fish and wildlife resources...” (USEPA, 2010a).

As mining-related aquatic impacts will not be effectively mitigated as a result of Mingo Logan’s proposed mitigation plan, the permit therefore fails to meet the requirements of this guideline and should not be approved.

Finally, while environmental justice concerns lack the force of law, USEPA explicitly recognizes that “surface coal mining can have adverse environmental and health impacts on neighboring communities,” and notes that federal statutes and regulations require, during the review of surface mine permits, “consideration of the full range of potential impacts on the environment, human health, and communities,” particularly low-income or minority populations. As described in Section 1.2.2, Logan County qualifies as a low-income population, because 24% of its residents live below the poverty line, exceeding state and national averages (USEPA, 2010a). Therefore, given the economic status of Logan County residents, and the probable impacts experienced by neighboring communities, we conclude that before the mine can be approved, “additional analysis of the potential for disproportionately high and adverse effects on the low-income populations (in the vicinity of the Spruce No. 1 mine) needs to be conducted” (USEPA, 2010a, p. 42).

USEPA regulations and CWA guidelines provide for the protection of public health, water quality, and other environmental resources. As evidenced by recent scientific data, the historical application of rules and regulations pertinent to Appalachian surface mining operations has failed to achieve the intended goals. The potential for the operation of the Spruce No. 1 MTR mine to result in adverse and irreversible environmental effects, both individually and cumulatively, requires a strict application of CWA guidelines as a decision is made on the permit. Particularly in light of the refusal by USACE and Mingo Logan to revise or modify the permit in a manner that satisfies CWA guidelines, it is the obligation of USEPA to ensure that the predicted impacts from Spruce No. 1 are avoided, even if doing so requires a veto of the permit, as authorized under CWA Section 404(c).

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