

EVALUATION OF MINE DRAINAGE LIABILITY DURING PREAQUISITION SITE ASSESSMENTS¹

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Abstract: Preaquisition site assessments of coal mining property have recently evolved to include evaluation of potential liability of mine drainage from pre- Surface Mining Control and Reclamation Act (SMCRA) mine sites in addition to SMCRA regulated sites. Implementation of the Total Maximum Daily Loads (TMDL) program of the Clean Water Act will only increase regulatory scrutiny of streams impacted by mine drainage, thus only increasing the risk that an “innocent landowner” will purchase a pre-SMCRA mine drainage liability. Evaluation of mine drainage liability during preaquisition site assessments includes extensive records review, regulatory official interviews, and field and laboratory testing. A recently completed typical project identified \$80,000 in capital cost and \$144,000 in annual cost to treat acid mine drainage (AMD) from SMCRA sites and \$43,000 in capital cost and \$84,000 in annual costs to treat AMD from pre-SMCRA sites.

Key Words: Coal Mine Site Assessments, Acid Mine Drainage, TMDLs

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Introduction

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (same statute that created “Superfund”) regulates past and present releases of hazardous substances into the environment. CERCLA, among other things, makes the current property owner liable for such releases, whether or not the property owner caused the release. The Superfund Amendments and Reauthorization Act (SARA) of 1986 allowed purchasers to qualify for the “innocent landowner defense”. The “innocent landowner defense” (also known as the “innocent purchaser defense”) allowed a defense to liability provided that the landowner “made all appropriate inquiry into the previous ownership and use of the property consistent with good commercial or customary practice”. Based on SARA, purchasers of property began making preaquisition site assessments (PSA’s, also known as Phase I Environmental Site Assessments) in an attempt to identify CERCLA liability prior to

property purchase. In 1993, the American Society of Testing and Materials (ASTM) developed a standard for conducting PSA's. Other entities also developed standards. By the early to mid-1990's, PSA's of coal mining property had become common. PSA's of coal mining property had evolved to typically include evaluation of environmental liability under such environmental statutes as the Surface Mining Control and Reclamation Act (SMCRA) and the Clean Water Act (CWA). Evaluation of SMCRA and CWA liabilities typically included review of SMCRA/CWA permits, field reconnaissance of SMCRA/CWA sites, and discussions with regulatory agencies regarding such sites. Little evaluation was completed with respect to potential CWA liabilities from discharges from pre-SMCRA (i.e. pre-1977) mines, and many coal operators have assumed that they have no liability for pre-SMCRA discharges. As a result of increasing regulatory scrutiny and potential landowner liability under water laws, some recent purchasers of properties have chosen to evaluate potential liability of discharges from pre-SMCRA mine workings as part of the PSA. (For additional discussion of mineral and landowner liability for coal mine drainage, see R. McLusky and S. Harvey, *Recent Permitting and Enforcement Measures to Combat Acid Mine Drainage - Are They in Contravention of SMCRA?*, 17 EMLF [1996].) While there is little/no case history of liability for such pre-SMCRA discharges being assigned to purchasers, the implementation of the Total Maximum Daily Loads (TMDL's) program of the CWA (as is occurring in West Virginia) only increases the potential that an "innocent landowner" will be identified as a "deep pocket", and thus may purchase a significant pre-SMCRA mine drainage liability. (Note: While CERCLA has the "innocent landowner defense", the CWA has no such provisions. Thus evaluating for mine drainage liability during PSA's does not necessarily relieve the purchaser from liability, although it can allow development of data for assessing risks versus benefits. Recent purchasers have typically assessed risks for pre-SMCRA mine drainage liabilities by including factors that take into account the presumed probability that regulators will identify the property as needing regulatory enforcement, and the presumed probability that the current landowner [instead of the entities that benefitted from the mining] will be held liable.) The intention of this paper is to describe the current level of effort for evaluating mine drainage liabilities during PSA's, via description of a typical project, based on several recently completed projects.

Typical Project



A PSA was performed on an approximate 25,000 acre tract of coal mining property in West Virginia. The property included multiple pre-SMCRA and SMCRA deep mines, surface mines, coal preparation facilities, and coal refuse disposal areas. Potential mine drainage liability evaluation was completed via the following tasks:

- a. Records Review;
- b. Interviews with Regulators; and
- c. Field Reconnaissance, Water Sampling, Treatability Studies, and Estimation of Treatment Costs.

Records Review

Records were reviewed to identify/confirm sources of Acid Mine Drainage (AMD), to identify existing SMCRA bond amounts associated with SMCRA permits with AMD liability, and to identify streams draining the property that have been impacted by mine drainage. Records

researched included:

-  **SMCRA Permit Search:** A total of 66 SMCRA permits were reviewed to identify permits with AMD liabilities and to identify existing bond amounts associated with SMCRA permits with AMD liability. Four SMCRA permits (with a total of eight AMD treatment sites) were noted where the coal mine operator was treating for AMD. This included two coal refuse disposal areas and two surface mines. The SMCRA permits were also reviewed to obtain maps of mine workings (for later use during the field reconnaissance), to identify mine drainage impacted streams and sources of AMD (via the baseline water quality monitoring required for SMCRA permits), and to assist in the delineation of SMCRA versus pre-SMCRA sites during the field reconnaissance.
-  **Other Records:** The 303(d) Stream Sublist, Mine Drainage Impacted Waters [303(d) Sublist], a list required to be developed as part of the CWA TMDL program, was reviewed to identify streams believed to be impacted by mine drainage.

Such streams would presumably be receiving the most regulatory attention as TMDLs are developed and implemented. Six mine drainage impacted streams were noted on the 303(d) Sublist that either directly or indirectly drained the property.

Other records that could help identify AMD and mine drainage impacted streams and typically available for review during PSA's include reports on water quality generated by the United States Geological Survey (USGS) and West Virginia Division of Natural Resources, and Abandoned Mine Lands (AML) water quality studies.

Interviews with Regulators

Interviews were conducted with SMCRA regulatory officials to confirm the presence and location of AMD treatment facilities on the property, the likelihood of continued AMD treatment at such sites, and the SMCRA inspector's knowledge of pre-SMCRA mine drainage discharges on the property and of nearby mine drainage impacted streams.

Field Reconnaissance, Water Sampling, Treatability Studies, and Estimation of Treatment Costs

Field reconnaissance and water quality sampling was conducted to:

- a. Identify and characterize mine drainage from pre-SMCRA and SMCRA mining operations.
- b. Assess the quality of surface waters draining the property.

SMCRA sites were located based on the records review. Pre-SMCRA sites were located based on the records review, review of United States Geological Survey mapping, interviews with regulatory officials and other people familiar with the property, by chance encounter during the field reconnaissance, and by "chasing" low pH and/or high specific conductivity field readings and/or stream discoloration up a stream until a mine drainage source was identified.

Streams and mine drainage sources were assessed via intensive field sampling including field sampling of most "unnamed tributaries" with follow-up water quality sampling/analyses of

certain streams and mine drainage sources via a laboratory.

Field sampling primarily consisted of field readings of pH, specific conductivity, temperature, and visual estimates of flow. Laboratory analysis primarily consisted of pH, acidity, alkalinity, total iron, total aluminum, total manganese, total dissolved solid, total suspended solids, and sulfates.

A total of 245 field readings were taken (190 on streams and 55 of mine drainage), with a follow-up 60 samples being collected for laboratory analyses. The field water quality sampling confirmed pre-SMCRA AMD (defined as pH <6.0), at 22 sites, and at eight discharge points where AMD was being treated under a SMCRA/CWA permit. Pre-SMCRA mine drainage was noted from surface mines, refuse disposal areas, deep mines, and auger holes. The preponderance of pre-SMCRA AMD discharges were from deep mine workings and auger holes. While some of the AMD drainage was low pH/high metals, much of the AMD was low pH/low metals. Since much of the AMD was from pre-SMCRA sites, it discharged in a relatively uncontrolled fashion (i.e. little consideration had been given during mining to collect mine drainage and direct it to centralized locations). Streams were sampled, and 16 were noted as being out of compliance with presumed state water quality standards for pH, iron, manganese and aluminum. (The presumed standards were pH ³ 6.0 and £ 9.0, total iron £ 1.5 mg/l, total manganese £ 1.0 mg/l, and total aluminum £ 0.75 mg/l). The primary violation was for pH, and impacted streams primarily were small unnamed tributaries of larger streams. (Of the 16 streams, three were streams identified on USGS mapping as streams while others were presumed wet weather streams not identified on USGS mapping.) The laboratory analysis confirmed that some of the 303(d) Sublist streams draining the property were indeed out of compliance with state water quality standards, while other streams on the 303(d) Sublist did not appear to be out of compliance for state water quality standards. It should be noted that only one sample event was used to characterize the streams.







Upon identifying and characterizing potential mine drainage liabilities, an AMD consultant visited the SMCRA sites and a significant (and believed representative) portion of the pre-SMCRA sites. Water samples were collected and titrated. Based upon those results estimates of chemical usage, labor, etc. were determined. Evaluation for the applicability of passive treatment system technology was also made. Cost estimates were then developed for treating the sites. The costs presented were based upon the following assumptions:

- a. Treatment would be to assumed “worst case” future TMDL limits (i.e. pH ³ 6.0 to 9.0, iron and manganese at near non-detectable levels) for most of the SMCRA sites.
- b. Most pre-SMCRA sites would be treated by addition of chemicals only (i.e. the analytical results indicated that the preponderance of sites did not contain metals at concentrations to develop significant amounts of sludge, thus collection ponds were assumed not necessary and sludge removal/disposal costs were not applicable). Some pre-SMCRA sites were assumed to be treated by passive treatment technology such as successive alkalinity systems (SAPS) and limestone drains.
- c. Annual AMD maintenance costs were distributed over the entire property, thus allowing for “economics of scale” for maintenance costs.
- d. Limited capital costs were calculated based on the existence of AMD treatment facilities at the SMCRA sites and due to “b” above.
- e. No permitting, legal work, compliance analytical data, or engineering was included.

The AMD consultant estimated the eight SMCRA permitted sites to have a treatment cost of \$80,000 in capital cost (to convert one site from a chemical treatment system to a passive treatment system) and \$144,000 in annual operation costs. Pre-SMCRA mine drainage discharges were noted to require \$43,000 in capital cost (to install passive treatment system technology at some sites) and \$84,000 in annual operation costs.

Summary

Preacquisition site assessments of coal mining property have recently evolved to include evaluation of potential liability of mine drainage from pre- Surface Mining Control and Reclamation Act (SMCRA) mine sites in addition to (SMCRA) regulated sites. Implementation of the TMDL program of the Clean Water Act will only increase regulatory scrutiny of streams impacted by mine drainage, increasing the risk that an “innocent landowner” will purchase a pre-SMCRA mine drainage liability. Evaluation of mine drainage liability during preacquisition site assessments includes extensive records review, regulatory official interviews, and field and laboratory testing. A recently completed typical PSA of approximately 25,000 acres in West Virginia included:

-  Review of 66 SMCRA permits;
-  245 field readings;
-  60 laboratory analyses;
-  Identification of 22 pre-SMCRA AMD sites;
-  Identification that certain streams were out of compliance for state water quality standards; and
-  Estimation of the following potential AMD treatment costs:

	Capital	Annual
SMCRA sites	\$80,000	\$144,000
Pre-SMCRA sites	\$43,000	\$84,000

Literature Cited

1. 1998 303(d) List, West Virginia Division of Environmental Protection.
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