

The Effects of Subsidence Resulting from Underground Bituminous Coal Mining on Surface Structures and Features and Water Resources

February 2001

Supplement to the June 1999 Report

Prepared Under the Authorization of Section 18a of the Bituminous
Mine Subsidence and Land Conservation Act



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Commonwealth of Pennsylvania

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The Secretary

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To Governor Tom Ridge, members of the General Assembly,
Environmental Quality Board and Citizens Advisory Council:

I am pleased to provide you with this copy of DEP's Supplemental Report on the Effects of Underground Coal Mining. The supplement was prepared to fulfill DEP's commitment to address unresolved issues from the 1999 report and to provide additional information on damage claims that originated during the 1993-1998 study period.

Under the 1994 amendments to the Commonwealth's Bituminous Mine Subsidence and Land Conservation Act (Act 54), mine operators are responsible for repairing or compensating for damages to certain structures and water supplies caused by underground mining. The act requires DEP to assess the effects of underground mining every five years. The 1999 report was the first report ever completed on damages caused by deep mine operations, and we are appreciative of the feedback we received regarding that report.

In preparing the supplemental report, DEP again attempted to contact property owners in the study area to develop more information on damage claims that were pending. Through additional investigations and surveys, we are now able to provide a more complete picture of the impacts of underground mining and the resolution rates for damages.

Using this additional data, DEP was able to confirm that damage from underground mining occurred on 173 more properties in the study area than documented in 1999, but the percentage of properties with damage reported decreased by 11 percent overall (from 59 to 48 percent). DEP also found that mine operators are generally complying with their responsibilities under the law to repair damages. At the time the supplemental report was completed, 70 percent of the damages had been resolved, rather than the 58 percent in the original report.

To better clarify the effects of underground mining, DEP is contracting with consultants to perform independent, scientific studies. Three separate studies will evaluate the effects of subsidence on streams, wetlands and riparian areas, forestland, and property values.

The supplemental report is intended to be read in conjunction with the 1999 report to provide the full scope of the study. Included with the supplemental report is an "At A Glance" section that provides a detailed summary of the data. The supplement, as well as the 1999 report, are both available on DEP's website at www.dep.state.pa.us (choose directLINK "Act 54").

Sincerely,

James M. Seif
Secretary

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Executive Summary

Underground coal mining, like many other human activities, cannot be conducted without some impact on the environment. For underground coal mining, particularly longwall mining, obvious impacts are often seen at the surface, in the form of subsidence. When the coal is removed, the resulting void causes the overlying surface to subside, creating the potential for impacts to structures, land, water supplies and streams.

The process of recovering coal has many complications beyond the technical challenges of operating beneath the surface. One of the most important considerations is the temporary disruption to people's lives as the mining progresses. This disruption is rooted in the complicated provisions of Pennsylvania's laws related to property rights.

Pennsylvania law recognizes three separate estates in land: the mineral estate, the surface estate and the support estate. That is, each estate is a distinct property interest. This arrangement is unique because the support estate can be conveyed apart from either the mineral estate or surface estate. The support estate is always owned by either the mineral estate owner or surface estate owner. If the support owner is a mine operator, the support estate is used to facilitate exploitation of the mineral estate. When the surface owner holds the right of support, he can use it to ensure support for that surface and prevent subsidence. Although Pennsylvania recognizes the support estate as a separate property interest, someone who does not also possess either the mineral estate or the surface estate cannot use it profitably.

An expert in property and mineral rights discussed these provisions at an educational hearing sponsored by the Legislative Coal Caucus in November 1999. In describing the three estates, he pointed out that "...Pennsylvania is the only state in the nation that has that creation, the right of support as a separate ownership right that can be owned independently of both the coal and surface."¹ This characteristic of Pennsylvania law, in conjunction with the provisions of the Bituminous Mine Subsidence and Land Conservation Act, lead to the results that are the subject of so much concern. This reality was recognized by a Citizens Advisory Council (CAC) representative who testified that, "I can think of no other parallel where I, as one property owner, can damage my neighbor and just be given approval to do that as long as I do this. I can't do that anywhere else. But in this instance, the mineral rights owners can damage his surface neighbor with the approval of all of us."² These sentiments were echoed by a resident from Indiana County, who also accurately pointed out that although the law permits damage, it also "...provides for remediation and repair of damage and loss."³

¹ Transcript of *Public Hearing on the Matter of Act 54*, Testimony of Cyril Fox, Professor, University of Pittsburgh School of Law, page 148, line 25. Legislative Coal Caucus, Belle Vernon, PA, Nov. 18, 1999.

² *Ibid.*, Testimony of Susan Wilson, Executive Director, Citizens Advisory Council, page 30, line 3

³ *Ibid.*, Testimony of Donald Cardose, page 289, line 14

The Department of Environmental Protection has prepared this report as a supplement to the 1999 report, *The Effects of Subsidence Resulting from Underground Bituminous Coal Mining on Surface Structures and Features and Water Resources*. The supplement was prepared to address comments received on the 1999 report and to provide information on cases that lacked definitive resolutions in the 1999 report, including more detail on impacts to water, structures and land resulting from underground mining.

One of the key issues addressed by the supplement is more comprehensive accounting of circumstances on properties situated above or near mining in a 10-county area in western Pennsylvania between August 1993 and August 1998. At the close of data collection for the 1999 report, DEP had information on 1,060 of 1,884 properties that were identified as proximate to study period mining. Through additional data collection and analysis, DEP has compiled additional information on 671 properties, bringing the total number of properties accounted for to 1,731 (see Table 1).

Table 1
Statistical Summary

Categories	Properties	
	1999	2000
Total properties	1884	1855
Properties accounted for	1060 (56%)	1731 (93%)
Properties with definitive information	1060 (56%)	1677 (90%)
Properties reporting damage	629	802
Damage (% of total properties)	33%	43%
Damage (% of properties with definitive information)	59%	48%
Damage cases resolved	367 (58%)	558 (70%)
Damage cases in process/Other status	262 (42%)	244 (30%)

As a result, DEP is now able to provide a current account of circumstances on 90 percent of the properties that were proximate to mining during the study period.

There were reports of damage associated with 802 properties. To provide the most accurate picture, this accounting includes all reports of damage, some of which were ultimately found to be unrelated to mining. Not surprisingly, the largest percentage of reported impacts was found to be associated with longwall mining. There were, however, a significant number of reported water supply impacts associated with room-and-pillar mining. As a class, water supply impacts were the most frequently reported type of effects for both longwall and room-and-pillar mines.

Many cases of reported impacts were resolved or in the process of being resolved. In 49 cases, mine operators were identified to be the owners of the properties at the time of mining. Many of

the findings regarding case resolutions were the result of follow-up inquiries and investigations conducted by DEP.

The supplement also presents information on two cases that were not included in the 1999 report. One of these cases involved damage to a segment of railroad in Washington County. The other case involved damage to a large-diameter water transmission line serving the city of Washington. Upon discovering the omission of the Washington water line incident, DEP investigated to see if damage to other privately operated community water systems was excluded. DEP's research revealed 12 privately operated water systems that may have been missed by previous survey efforts. Communications with the operators of all 12 systems turned up no additional impacts to report.

As a final area of investigation, DEP looked into the matter of confidentiality clauses in agreements between mine operators and property owners. Speculation about the impact, if any, that these so-called "gag orders" might have on data collection was expressed at the November 1999 Legislative Coal Caucus hearing. This investigation focused on the issue of whether these clauses may have prevented many property owners from reporting information to DEP.

During the course of the 1999 telephone survey, DEP encountered eight cases where there were not confirmed reports of confidentiality clauses but property owners were unwilling to provide information. DEP had previously identified only seven property owners who reported having confidentiality agreements with mine operators. As is discussed in more detail on page 27, confidentiality agreements did not prove to be a factor in DEP's ability to obtain information on nearly 93 percent of the 1,884 properties in the original survey population. Circumstances among the remaining seven percent of the properties cannot be stated with certainty; although many of these are situations where the property owners did not respond to DEP's survey efforts or the mine operators had gone out of business, leaving no available sources of information.

Like the 1999 report, this supplement relies heavily on statistics to describe the nature and extent of effects caused by underground mining. DEP acknowledges that information relating to the number of impacts reported and the number of cases resolved does not capture the emotional effects that mining impacts have on the lives of area residents and property owners. These emotional effects are real, but are beyond the scope of this report. In addition, these effects would be difficult, if not impossible, to quantify in a scientific manner.

Purpose of the Supplement

This supplement has been prepared as an addition to DEP's June 1999 report, *The Effects of Subsidence Resulting from Underground Bituminous Coal Mining on Surface Structures and Features and Water Resources*. It addresses issues that were raised by reviewers of the 1999 report and cases that were left unresolved at the close of the period covered by the report.

The need for a supplement was acknowledged in the 1999 report. After analyzing the data that had been obtained at that time, DEP recognized that many cases were at an inconclusive stage of resolution and in need of follow-up investigations. DEP surveys conducted during 1998 revealed many cases that had not previously been reported to either the mine operator or the department. There were also cases where determinations of no liability had been reached without DEP involvement. In addition, there were cases that appeared to be stalled because the mine operator and property owner could not come to terms on the means of resolution and also cases where circumstances were unclear. As a result, DEP committed to conducting additional investigations and publishing a supplementary report.

Following the release of the 1999 report, DEP received comments from the Citizens Advisory Council and various citizens' groups. In addition, the Coal Caucus of the Pennsylvania General Assembly held an educational meeting in November 1999, where interested individuals presented commentary on the 1999 report and the Bituminous Mine Subsidence and Land Conservation Act in general. After receiving these comments, DEP decided to expand the scope of the supplement to address, to the extent possible, the additional issues raised.

This supplement is organized into several sections. Following the *Executive Summary* and this section, a discussion of issues raised as part of the commentary of the 1999 report is presented in *Issues Resulting from Comments on the 1999 Report*. The section includes a summary that incorporates information obtained since June 1999. Following that, the section titled *Improvements to Data Gathering Systems* describes the steps DEP has taken to improve data collection and track unresolved cases. Finally, *Follow-up on Issues Identified in the 1999 Report* presents findings on the cases that were targeted in the 1999 report for follow-up investigation.

Issues Resulting from Comments on the 1999 Report

Introduction

This section of the supplement has been prepared to address comments on the 1999 report. Although the information does not address all the issues raised by commentators, DEP has attempted to address those items that could be covered through short-term data collection efforts. The objective was to address as many issues as possible without unduly delaying the release of the supplement.

Additional Details Regarding the Survey Population and Data Sources

The first item addressed by this supplement is an updated accounting of information on the 1,884 properties that made up the survey population for the 1999 report. Table 2 illustrates that the survey population was made up of properties identified through three sources. One group consisted of properties that had study-period mining within 200 feet of their boundaries as depicted on six-month mine maps. This was the group targeted by direct mailing during DEP's 1998 property owner survey.

The second group consisted of property owners who requested property owner survey questionnaires in response to DEP's public outreach efforts. These properties were not within 200 feet of study-period mining and, therefore, outside the range of DEP's direct mailings. Together, these two groups made up the 1,603 properties identified in Table IX.1 of the 1999 report.

The third group consisted of properties identified through DEP's Claims Database. (The Claims Database consists primarily of properties with impacts reported by mine operators and does not include information on properties that had no impacts). Many of the properties in the Claims Database were included in the combined group of 1,603 properties discussed above; however, 281 were not. Consequently, these 281 properties were added to the 1,603 properties to create a total survey population of 1,884.

Table 2
Summary of Properties in Survey Population

Category	Properties	
Identified from six-month mine maps	1568	
Questionnaires requested by property owners	35	
<i>Identified properties, Table IX.1, 1999 report</i>		<i>1603</i>
Records from claims database not included in other groups		281
Total		1884

Some commentators questioned the extent to which DEP had obtained definitive data on the 1,884 properties included in the study population. From the report, they could identify only 779

properties as having associated responses from the 1998 property owners' survey. These commentators further questioned whether it was appropriate to assume that a property had experienced no adverse effects if it did not have an associated survey form or claim record.

After reviewing this matter, DEP recognized that the commentators' concerns were due, in part, to the fact that the 1999 report did not present a detailed discussion of the information obtained from the Claims Database. The Claims Database is the primary repository for reports filed by operators, and the information represented by these records was incorporated into the tabulation of effects reported. DEP gave greater prominence to the efforts made to gather supplementary information from property owners over the routine reports made by operators for two reasons. First, information gathered from property owners was provided voluntarily since property owners are not required to submit such reports. Second, information gleaned from these reports provided a means to crosscheck information that DEP had previously collected and was continuing to collect from operators. Consequently, the 1999 report did not specifically highlight the 493 records from the Claims Database (281 of which were not duplicated elsewhere) that were also used in the data analysis. In many cases, a claim record was available to provide information on a property even though the property owner had not returned a questionnaire. By the time data collection was closed for the 1999 report, information was available in one form or another for 1,060 of the 1,884 properties.

Additional Data Collection Efforts

Even though information was available on 1,060 properties, several commentators questioned the validity of extrapolating observations to the entire survey population. In response, DEP took steps to obtain information on the remaining 824 properties that were unaccounted for at the time of the 1999 report. Databases were reviewed to identify data gaps and updated to include additional information from the 1998 property owners' survey. DEP conducted an additional telephone survey targeting the property owners that had not responded to previous survey efforts. DEP queried mine operators about properties on which it had no available information. In addition to these activities, DEP made numerous contacts with mine operators and property owners in an effort to fill in the gaps for incomplete data records.

The update of DEP's central Act 54 database involved several activities. One activity was the entry of information from questionnaires received after the close of data collection for the 1999 report. Another activity involved a review of partially completed questionnaires from the property owners' survey to gather additional usable information. Through these activities, DEP was able to add reports for 38 properties, thus increasing the total number of properties with available information from 1,060 to 1,098.

DEP's progression in increasing the number of properties where specific information was available is described here and summarized in Table 3. The 1999 telephone survey was conducted in December of that year. These property owners were asked to confirm whether they had or had not experienced adverse effects attributable to mining and to disclose the nature of any observed effects and

the resolution provided by the mine operator. Property owners were also asked if they were prohibited from providing this information under the terms of a signed agreement. By the conclusion of this effort, DEP had successfully contacted 224 property owners, bringing the total number of properties for which some type of contact had been established to 1,322. Of the 224 property owners who were contacted, 211 provided information that was usable, thus increasing the number of properties with available information to 1,309.

Table 3
Summary of Results from Additional Data Collection Efforts

Source of Information	Properties	Cumulative
1999 Report	1060	1060
Late responses to questionnaires and additional questionnaire processing	38	1098
1999 Telephone survey	224	1322
1999 Mine operators' survey	424	1746

After completing the two aforementioned activities, DEP refined the list of 575 properties for which information was still lacking and asked mine operators to report information that they had regarding these properties. The master list was subdivided into smaller lists containing properties associated with individual mines. Mine operators were directed to report whether or not a claim had been received, the nature of any reported damage and the current status of resolutions. This request resulted in responses relating to 424 properties and additional information on 422 of those properties. At the conclusion of this effort, DEP had contacted the owners of 1,746 properties and obtained usable information for 1,731 properties. The 1,731 figure included 49 properties that were owned by mine operators at the time of reporting and for which there were no details regarding the existence or absence of damage.

The effort was highly successful in enabling DEP to fill in gaps to the extent that information was available. The 1,746 properties for which DEP established contact is an increase of 686 properties over the 1,060 that were previously counted and represents nearly 93 percent of the total 1,884 properties. Remaining gaps include situations where the property owners did not respond to DEP surveys and mine operators had gone out of business, and situations where property owners requested but failed to return survey questionnaires.

Summaries of results from the 1998 and 1999 surveys of property owners and mine operators are presented in Table 4 and Table 5. It should be noted that while the Claims Database contains information derived from the 1998 mine operators' survey, it also contains some information derived from property owner complaints filed with the McMurray District Mining Office. For purposes of this analysis, the Claims Database is treated as a mine operator data source.

Table 4
Information Received from Property Owners' Surveys

Information Source	Reported Problem	Reported No Problem	Insufficient Information	Total	Reported Problems /Total (%)
1998 Property Owner Survey (questionnaires and telephone survey)	332	431	40	803	41
1999 Property Owner Survey (telephone survey)	43	168	13	224	19
TOTAL	375	599	53	1027	37

Table 4 and Table 5 present analyses of the information derived from each data source. The information in the two tables is presented separately so that the reader can understand the scope of information reported by each source. Reports are divided into three groups. One group consists of reports that indicated problems. Another group comprises reports that indicated no observed impacts. The final group consists of reports that contained no usable information. The reporting unit for all cases is the property.

The reports provided by property owners and mine operators that are summarized in Table 4 and Table 5 are not mutually exclusive because they include overlap for 160 properties. The overlap reflects the differing types of information provided by each source. For example, during the 1998 survey efforts, property owners were the only group reporting observations of no impact. During the same time interval, mine operators were only asked to report on properties for which they had received reports of impacts. In addition, during the 1998 survey, property owners reported impacts that had not been reported previously to anyone, making it improbable that there would be corresponding reports in the Claims Database. Finally, the 424 reports from the 2000 mine operators' survey represent information that was derived totally from the mine operators. As previously indicated, this survey was conducted after DEP had concluded its efforts in surveying property owners.

Table 5
Information Received from Mine Operators' Surveys

Information Source	Problems	No Problems	Operator Owned Property	Total
1998 Claims Database Records	493	0	0	493
2000 Mine Operators' Survey	95	280	49	424
TOTAL	588	280	49	917

It should be noted that 14 of the additional impacts discovered through the 1999 property owners' survey and the 2000 mine operators' survey occurred after Aug. 31, 1998 (i.e., the close of the 1993-1998 study period).

Table 4 and Table 5 also provide information on the additional impacts identified through the December 1999 and January 2000 surveys. Table 4 shows that 19 percent of property owners contacted in 1999 reported impacts, compared to 41 percent of the earlier group.

Accounting for 1,884 Properties in the Survey Population

Figure 1 provides an accounting of the information obtained for the 1,884 properties that were discussed in the 1999 report. Several matters are addressed in this figure, including information availability, reports of impacts and reports indicating no effects. Information is presented by mine type to facilitate comparisons between longwall mining operations and room-and-pillar mining operations. Details are provided to explain special circumstances relating to the information presented.

Figure 1 shows an adjustment that reduces the study population to 1,855 properties from 1,884 properties. Thirteen of the properties originally included in the 1999 study were actually associated with pre-study period mines (i.e., mines that ceased operations before Aug. 1, 1993). Another 15 properties could not be associated with any mine operating during the study period. This group originated primarily from individuals who requested questionnaires but did not return them. It also included two properties with problems related to surface mining. There was also one property with a duplicate record in the database.

The 1,855 properties were divided into three groups based on the mine types with which they were associated. There was almost an even split between properties situated over longwall mines (932) and properties situated over room-and-pillar mines (923).

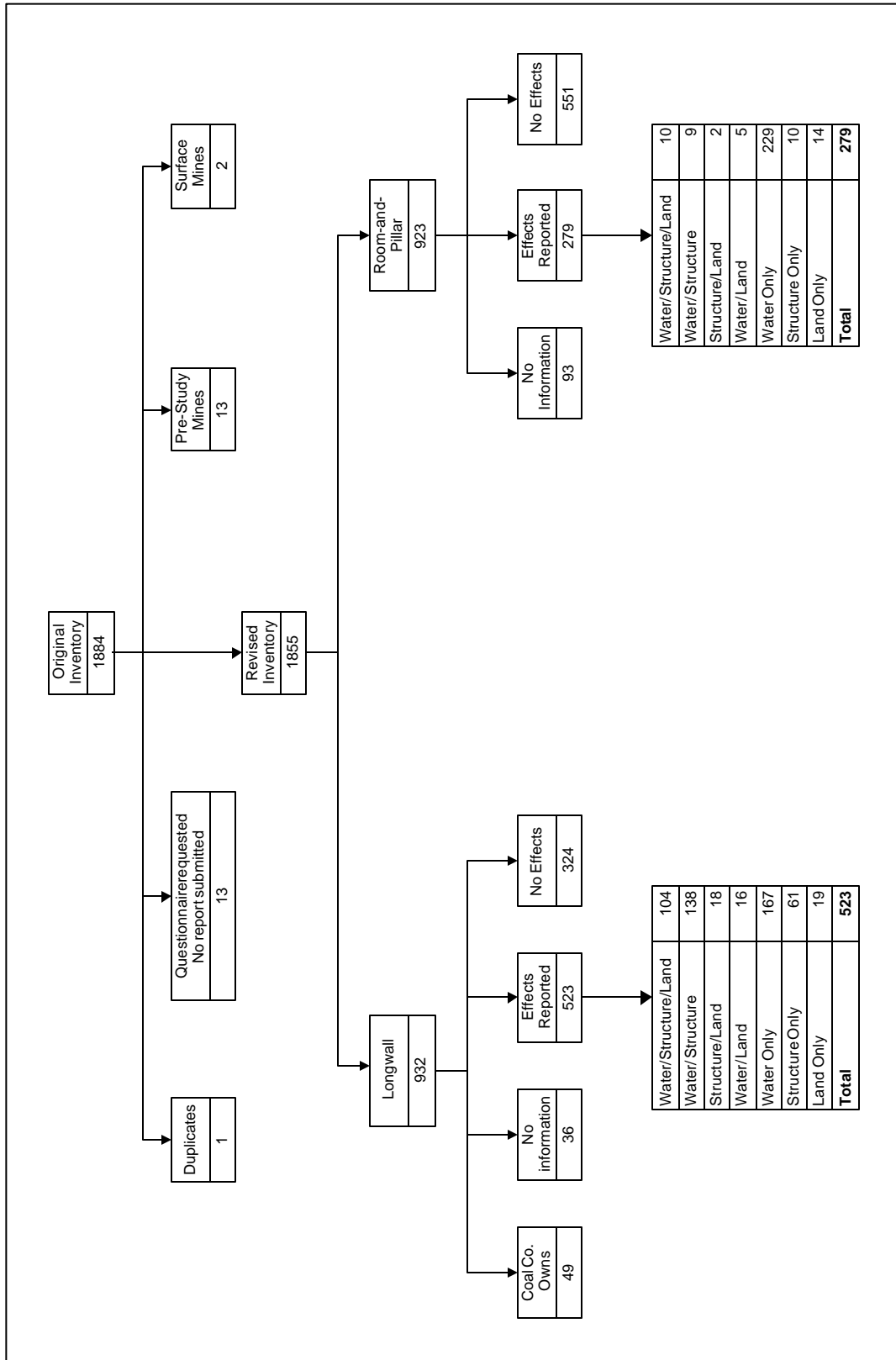
At the next level, Figure 1 illustrates the type of reports filed for properties within each mine type category. These details show the number of properties that had associated reports of impact, the number of properties that had associated reports indicating the absence of impacts, and the number of properties that had no associated report of any kind. The longwall category also has one additional information group. This group includes properties that had no associated report of damage but were owned by the mining companies prior to mining.

The information presented in Figure 1 indicates that 523 of the 932 longwall properties had associated reports of impact. The group of 932 longwall properties also includes 49 properties owned by coal operators that may or may not have had impacts. For room-and-pillar properties, there were 279 impact reports among 923 total properties.

The final set of details on Figure 1 lists the number of properties with associated reports of impacts for each mine type category. In order to describe the extent of impacts, property counts are

based on impact groupings. For example, there were 104 properties in the longwall mine category with associated reports of water, structure and land impacts. Within this same

Figure 1
Summary Accounting for 1,884 Properties



category, there were 138 properties with associated reports of water and structure impacts but no reports of land damage. As indicated by the impact summaries, the largest number of impacts was reported in association with longwall mines.

Additional details regarding impact reports and their resolutions are presented in the following pages. These discussions reference Figure 2 on page 14. Figure 2 presents the same information as in Figure 1, but is structured to segregate properties for which definitive information on status is known. The figure illustrates that DEP now has definitive reports on the status of 1,677 properties or 90 percent of the 1,855 properties that comprise the study population for the 1993 – 1998 period.

Reports of Impacts and Resolutions for 1,677 Properties

Overview

The summary of impacts in Figure 2 is broken down to show type of impact (land, structure or water) by mine type category. When viewed in this perspective, there were 425 reports of water supply impacts, 321 reports of structure damage and 157 reports of land damage in the longwall category (see the longwall column in Table 6, Table 7 and Table 8).

Table 6
Summary of Water Impacts by Mine Type

Category	Longwall	Room-and-pillar
Water/Structure/Land	104	10
Water/Structure	138	9
Water/Land	16	5
Water Only	167	229
Total	425	253

Similarly, the breakdown for room-and-pillar mines presented in the room-and-pillar column in the three tables is 253 water supply impact reports, 31 structure damage reports and 31 land damage reports.

Table 7
Summary of Structure Impacts by Mine Type

Category	Longwall	Room-and-pillar
Water/Structure/Land	104	10
Water/Structure	138	9
Structure/Land	18	2
Structure Only	61	10
Total	321	31

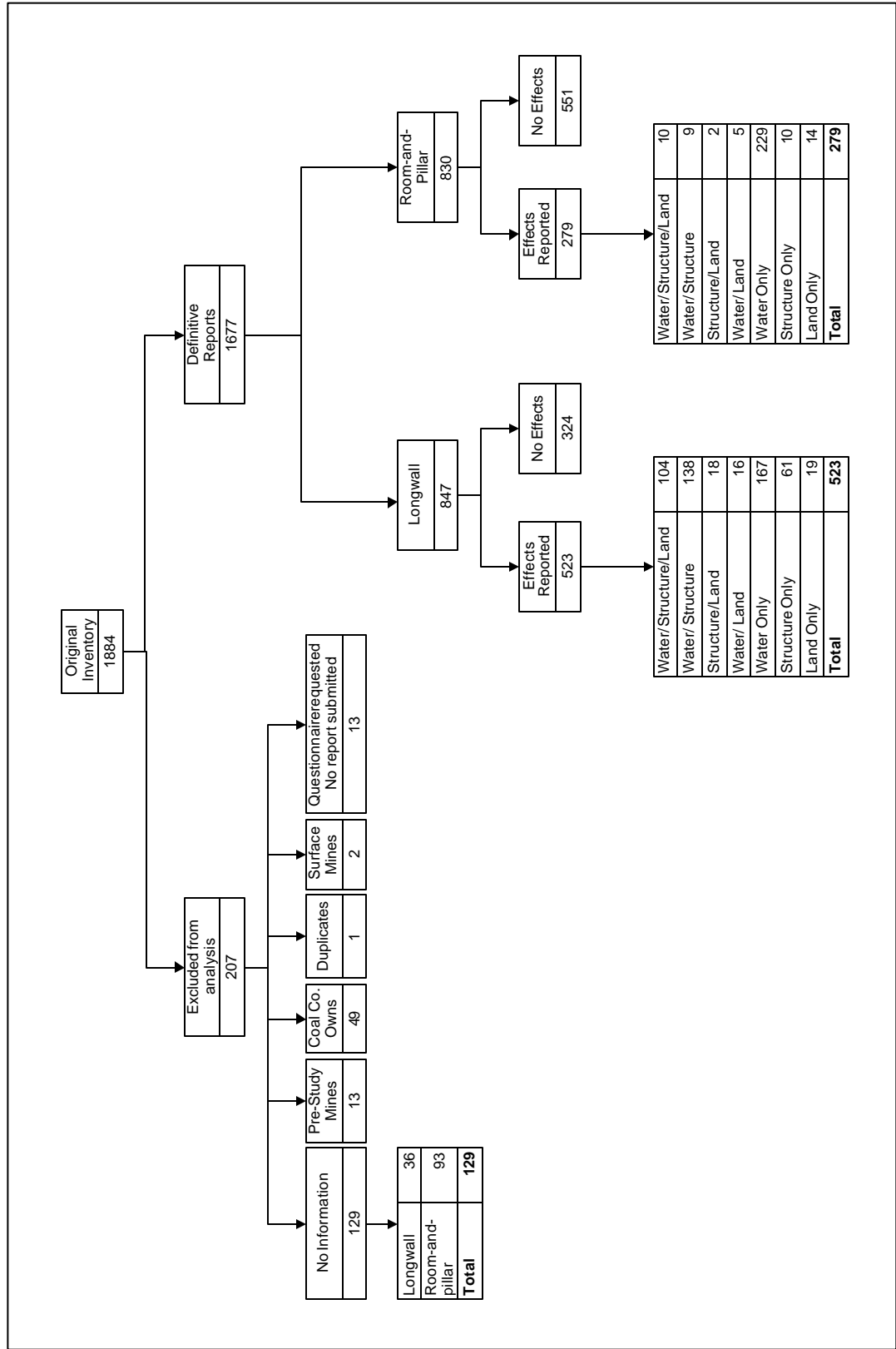
Table 8
Summary of Land Impacts by Mine Type

Category	Longwall	Room-and-pillar
Water/Structure/Land	104	10
Structure/Land	18	2
Water/Land	16	5
Land Only	19	14
Total	157	31

Comments received on the 1999 report indicated that readers were interested in seeing impacts and resolutions tabulated by mine type. The remainder of this subsection is structured in that manner.

In addition, resolution summaries are presented on the basis of the type of report (i.e., water supply impact, structure damage, or land damage). The reporting unit is still the property, but the impacts are separated by type. In some cases, a property owner may have reported structure damage that was repaired and may also have reported a water supply impact that was found to be unrelated to mining. The same relationship may also hold for other types of combinations involving the same property. For this reason, reported impacts are grouped by type.

Figure 2
Summary Status of Study Properties (Revised View)



Impacts and Resolutions for the 523 Properties Situated Above Longwall Mines

As shown in Figure 2, there were 523 longwall properties that had reported impacts of some type. Water supply impacts were the most commonly reported type of impact associated with longwall mines. There were also 321 reports of structure damage and 157 reports of land damage associated with the longwall category (see Table 6, Table 7 and Table 8). Not surprisingly, there were proportionately more reports of impacts among the properties over longwall mines.

Table 9 presents the outcomes and resolutions for the 425 longwall properties that were reported to have some type of water supply impact. Collected information indicates that 237 cases, or 56 percent of the total, were resolved with some type of remedy to the property owners. Most of these cases were resolved by re-establishing a permanent water supply. There were also 33 cases that were resolved by agreements or compensation. Two cases were settled by the mine operator purchasing the affected property. There were also 33 cases that were reported to be settled but lacked details regarding settlements.

Another 120 cases, or 28 percent of the total, were reportedly in the process of being resolved. These were cases where mine operators had taken positive steps toward reaching settlements, such as providing temporary water, making temporary repairs or negotiating compensation arrangements with property owners. In 90 of these cases, property owners were reported to be on temporary water. In another 30 cases, claims were reported to be in process, but there was no information regarding the provision of temporary water.

In 52 cases, or 12 percent of the total, no remedial action was required. Most of these cases involved situations where the mine operators were not liable to replace the water supplies. Determinations of no liability were typically based on findings that mining was not the cause of conditions at the water supplies or findings that effects occurred prior to the effective date of water supply replacement requirements (i.e., both state and federal requirements). There were also two cases where no problems were found upon follow-up investigation.

The remaining 16 cases, or four percent of the total, fell into six subcategories representing a variety of circumstances. In eight of the cases, DEP was unable to obtain details regarding settlement status despite its efforts. There were four cases in which there was some type of problem or dissatisfaction regarding the remedy provided by the mine operator. One case was referred to the U.S. Office of Surface Mining (OSM) for enforcement under the federal program because the effects occurred after the effective date of federal water supply replacement requirements but before the effective date of Pennsylvania's water supply replacement requirements.⁴ One case was under investigation by the mine operator and pending a determination. Another case was newly reported as a

⁴ In Pennsylvania, the general responsibility to replace certain drinking, domestic and residential water supplies extends back to Oct. 24, 1992, under the National Energy Policy Act (EPACT). These requirements predate the Act 54 amendments to BMSLCA, which did not become effective until Aug. 21, 1994.

result of DEP's most recent survey efforts. There was also one case in which a property owner replaced his water supply without involving the mine operator.

Table 9
Reported Water Supply Impacts and Resolutions (Longwall)

Resolution Type	Number of Cases	Resolution Class	
		Subtotal	%
<i>RESOLVED</i>			
Permanent water supply reestablished	161		
Settled, means not disclosed	41		
Settled by agreement or compensation	33		
Mine operator bought property*	2		
<i>Resolved Subtotal</i>		237	56%
<i>IN PROCESS</i>			
Property owners on temporary water	90		
Claim in process	30		
<i>In Process Subtotal</i>		120	28%
<i>NO REMEDIAL ACTION REQUIRED</i>			
Mine operator not liable	50		
No actual problem	2		
<i>No Remedial Action Required Subtotal</i>		52	12%
<i>OTHER STATUS</i>			
Current details unavailable	8		
Resolution attempted but problems remain	4		
EPACT case	1		
Mine operator investigating	1		
Newly reported case	1		
Supply restored by property owner	1		
<i>Other Status Subtotal</i>		16	4%
TOTALS	425	425	100%

*These properties were not among the 49 previously referenced as belonging to mine operators

Two groups – the first including cases that had been resolved and the second where no remedial action is required – total 68 percent of the water supply cases associated with longwall mining operations and are considered as having final resolutions. Another 28 percent were in various stages of the resolution process.

There were 321 reports of structure damage associated with the longwall property grouping. Table 10 presents the summary of outcomes and resolutions for these reports. As shown in the table, 204 cases, or 64 percent of the total, were reported to be at the stage of final resolution with some type of remedy or compensation provided to the property owners. In 111 cases, settlements were achieved through compensation or agreements. In 50 cases, the mine operators repaired the structure damages. There were also 43 cases that were reportedly settled but were lacking details regarding the means of settlement.

Table 10
Structure Damage Reports and Resolutions (Longwall)

Resolution Type	Number of Cases	Resolution Class	
		Subtotal	%
<i>RESOLVED</i>			
Settled by agreement or compensation	111		
Repaired	50		
Settled, means not disclosed	43		
<i>Resolved Subtotal</i>		204	64%
<i>IN PROCESS</i>			
Claim in process	63		
<i>In Process Subtotal</i>		63	19%
<i>NO REMEDIAL ACTION REQUIRED</i>			
Mine operator not liable	29		
No actual problem	2		
<i>No Remedial Action Required Subtotal</i>		31	10%
<i>OTHER STATUS</i>			
Current details unavailable	14		
Outcome in dispute	4		
Newly reported case	2		
In litigation	1		
2 year reporting period expired	1		
Covered by Mine Subsidence Insurance	1		
<i>Other Status Subtotal</i>		23	7%
TOTALS	321	321	100%

In addition to those cases that were settled, there were 63 cases in which claims were in the process of being resolved. These were cases where mine operators have taken positive steps toward reaching settlements, such as making temporary repairs or negotiating compensation arrangements with

property owners. This group represented 19 percent of total structure damage cases associated with longwall mining operations.

Table 10 shows that there were 31 cases where no remedial action was required. This group represented 10 percent of the structure damage reports associated with longwall mining operations. Twenty-nine of these cases involved circumstances where the mine operator was not liable to repair or compensate for the damage. Determinations of no liability were based on findings that the damage was not attributable to underground mining or findings that the damage occurred prior to the time mine operators became responsible to repair or compensate for damage under state and federal regulatory programs. There were also two cases where follow-up inquiries revealed that there were no actual problems.

The remaining 23 structure damage cases fell into various categories. In 14 cases, there was no current information regarding the current status of negotiations or resolutions. There were four cases in which property owners were dissatisfied with the remedy offered or provided by the mine operator and one case where the outcome was being litigated. One case was newly discovered as a result of DEP's most recent survey efforts. In another case, neither repair nor compensation was provided because the property owner did not report within the two-year period allowed by Act 54. There was also one case that was settled under DEP's mine subsidence insurance program.

Two groups – the first including cases where some resolution has been effected and the second where no remedial action is required – together total 74 percent of the structure damage cases associated with longwall mining activities and are considered as having final resolutions. Another 19 percent were in the resolution process.

Table 11 shows the outcomes and resolutions for the longwall properties with reported land damage. There were 157 reports of land damage associated with longwall mining operations. The collected information indicates that 83 of these cases, or 53 percent of the total, have been resolved with some type of remedy to the property owners. In 45 cases, the mine operators repaired the land damages. In 21 cases, settlements were achieved through compensation or agreements. There was also one case where the mine operator bought the affected property. In 16 cases, there were settlements but the means of settlement were not provided. There were also 28 cases that were in the process of being resolved. These were cases where mine operators had taken steps toward reaching settlements, such as working on repairs or negotiating compensation arrangements with property owners.

Table 11
Land Damage Reports and Resolutions (Longwall)

Resolution Type	Number of Cases	Resolution Class	
		Subtotal	%
<i>RESOLVED</i>			
Repaired	45		
Settled by agreement or compensation	21		
Settled, means not disclosed	16		
Mine operator bought property*	1		
<i>Resolved Subtotal</i>		83	53%
<i>IN PROCESS</i>			
Claim in process	28		
<i>In Process Subtotal</i>		28	18%
<i>NO REMEDIAL ACTION REQUIRED</i>			
Mine operator not liable	9		
No actual problem	6		
<i>No Remedial Action Required Subtotal</i>		15	9%
<i>OTHER STATUS</i>			
No indication that repairs were made	29		
In litigation	1		
Mine operator investigating	1		
<i>Other Status Subtotal</i>		31	20%
TOTALS	157	157	100%

*These properties were not among the 49 previously referenced as belonging to mine operators

Table 11 also indicates that no remedial action was required in 15 cases. Nine of these cases involved effects that were not attributable to underground mining. In six other cases, follow-up investigations revealed that there were no actual problems.

There were also 31 land damage cases that fell into other resolution categories. In 29 cases, DEP was unable to obtain current information regarding the status of previously reported cases. There was also one case that was in litigation and one case that was under investigation by the mine operator.

Two groups – the first including cases that had been resolved and the second where no remedial action is required – together represent 62 percent of cases and are viewed as having achieved final settlement. Another 18 percent were in the resolution process. In the remaining 20 percent of cases, information was unavailable for providing an updated status.

Impacts and Resolutions for the 279 Properties Situated Above Room-and-Pillar Mines

As shown in Figure 2, there were 279 room-and-pillar properties that had reported impacts of some type. Water supply impacts were by far the most commonly reported type of impact associated with room-and-pillar mines. There were 253 properties with associated reports of water supply impacts (see Table 6 on page 12). There were also 31 reports of structure damage and 31 reports of land damage associated with the room-and-pillar category (see Table 7 and Table 8 on pages 12 and 12).

Table 12 presents the outcomes and resolutions for the 253 properties that were reported to have some type of water supply impact. As indicated on the table, 111 cases, or 44 percent of the total, were resolved through some type of remedial action or compensation. In 97 cases, permanent water supplies had been re-established. There were also 13 cases that were reportedly settled but were lacking details regarding the means of settlement. One case was settled by agreement.

Table 12
Reported Water Supply Impacts and Resolutions (Room-and-Pillar)

Resolution Type	Number of Cases	Resolution Class	
		Subtotal	%
<i>RESOLVED</i>			
Permanent water supply reestablished	97		
Settled, means not disclosed	13		
Settled by agreement or compensation	1		
<i>Resolved Subtotal</i>		<i>111</i>	<i>44%</i>
<i>IN PROCESS</i>			
Property owners on temporary water	9		
Claim in process	3		
<i>In Process Subtotal</i>		<i>12</i>	<i>5%</i>
<i>NO REMEDIAL ACTION REQUIRED</i>			
Mine operator not liable	100		
<i>No Remedial Action Required Subtotal</i>			
<i>OTHER STATUS</i>			
Current details unavailable	18		
Resolution attempted but problems remain	6		
EPACT case	3		
Replaced by property owner	2		
Newly reported case	1		
<i>Other Status Subtotal</i>		<i>30</i>	<i>12%</i>
TOTALS	253	253	100%

In addition to those cases that had achieved final settlement, there were 12 cases that were in the process of being resolved. In nine of these cases, property owners were reported to be on temporary water. In the other three cases, the claims were still in process.

There were also 100 cases in which no remedial action was required because the mine operators were not liable to replace the water supplies.

The remaining 30 cases had outcomes that did not readily fit within the aforementioned resolution categories. There were 18 cases in which current details were unavailable. In six cases, there was some type of problem or dissatisfaction regarding the remedy provided by the mine operator. Three cases were referred to OSM because impacts occurred prior to the effective date of Act 54 but after the effective date of federal water supply replacement requirements. In two cases, the property owners replaced the water supplies by themselves without involving the mine operators. There was also one case that was newly reported as a result of DEP's latest survey efforts.

Two groups – the first including cases that have been resolved and the second where no remedial action is required – together represent 83 percent of the water supply cases associated with the room-and-pillar mine grouping and may be classified as having final resolutions. Another five percent may be regarded as claims in process.

Table 13 presents the summary of outcomes and resolutions for reported structure damage cases at room-and-pillar mines. There were 31 reports of structure damage associated with room-and-pillar mines. By comparison, this number is substantially smaller than the number of reports associated with the longwall mines. This was not surprising given that room-and-pillar mining plans can be more readily altered to avoid structure damage.

For the group, 23 percent of the cases were resolved through repair or compensation. An additional 19 percent of the cases were in the process of being resolved. In 32 percent of the cases, no remedial action was required because the mine operators were not liable or the property owner regarded the damages as insignificant. The remaining 26 percent of cases were distributed among various other resolution categories. Two groups – the first including cases that have been resolved and the second where no remedial action is required – together represent 55 percent of the reported structure damage cases and are considered to be resolved. Another 19 percent of the cases represent claims in process.

Table 13
Structure Damage Reports and Resolutions (Room-and-Pillar)

Resolution Type	Number of Cases	Resolution Class	
		Subtotal	%
<i>RESOLVED</i>			
Settled by agreement or compensation	4		
Repaired	3		
<i>Resolved Subtotal</i>		7	23%
<i>IN PROCESS</i>			
Claim in process	6		
<i>In Process Subtotal</i>		6	19%
<i>NO REMEDIAL ACTION REQUIRED</i>			
Mine operator not liable	9		
Damage insignificant	1		
<i>No Remedial Action Required Subtotal</i>		10	32%
<i>OTHER STATUS</i>			
Current details unavailable	4		
Outcome in dispute	2		
EPACT cases	2		
<i>Other Status Subtotal</i>		8	26%
TOTALS	31	31	100%

Table 14 shows the outcomes and resolutions for the room-and-pillar properties with reported land damage. There were 31 reports of land damage associated with the room-and-pillar group. As in the cases of structure damage, the number of reports is significantly less than the corresponding number associated with longwall mines. Within this group, 35 percent of cases were reported to be resolved. Another 13 percent of cases were reported to be in the process of being resolved. In 26 percent of the cases no remedial action was required. In one of these cases a ground crack healed without intervention. There were also seven cases representing 26 percent of the total in which there was no indication of remedial action or compensation.

Two groups – the first including cases that have been resolved and the second where no remedial action is required – together represent 61 percent of the land damage cases at room-and-pillar mines. Another 13 percent of the cases are in the resolution process.

Table 14
Land Damage Reports and Resolutions (Room-and-Pillar)

Resolution Type	Number of Cases	Resolution Class	
		Subtotal	%
RESOLVED			
Repaired	6		
Settled, means not disclosed	3		
Settled by agreement or compensation	2		
<i>Resolved Subtotal</i>		<i>11</i>	<i>35%</i>
IN PROCESS			
Claim in process	4		
<i>In Process Subtotal</i>		<i>4</i>	<i>13%</i>
NO REMEDIAL ACTION REQUIRED			
Mine operator not liable	4		
No actual problem	3		
Ground crack healed	1		
<i>No Remedial Action Required Subtotal</i>		<i>8</i>	<i>26%</i>
OTHER STATUS			
No indication that repairs were made	8		
<i>Other Status Subtotal</i>		<i>8</i>	<i>26%</i>
TOTALS	31	31	100%

Effects of Underground Mining on Utilities, Railroads and Other Facilities

The 1999 report included an inventory of damages to roads, natural gas pipelines and public water and sewer systems. Commentators noted that the report failed to mention two high-profile cases that occurred during the study period. One of these cases involved a 24-inch diameter water transmission line near Washington. In this case, the water system operator had to replace segments of the water line as longwall mining advanced beneath it. The other case involved repair of a rail segment that had subsided as a result of longwall mining. The rail line incident was also in Washington County.

The case involving the water transmission line was brought before the Pennsylvania Environmental Hearing Board (EHB Docket No.95-232-R). A private settlement was reached between the mine operator and the water company. The details of this settlement were not made available to the public or DEP. Although this settlement addressed the interests of the mining company and the water company, it did not address the inconvenience to local residents and property owners who had to deal with having a temporary 24-inch diameter water line above ground during the mining process.

The case involving the rail line was also brought before the Pennsylvania Environmental Hearing Board (EHB Docket No. 97-252-R). In this case, the railroad company sought to recover \$86,000 that it had spent to re-level and re-align the segment that had subsided. The Hearing Board ruled that the underground mining regulations do not authorize DEP to require the mine operator to compensate the railroad for these expenditures.

Based on its findings regarding the water transmission line, DEP investigated the possibility that other private operators of community water systems had been missed during its survey efforts. This investigation involved querying DEP's Geographic Information System for community water systems that were proximate to study-period mining and operated by an entity other than a municipality. (A community water system is defined as one that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.) DEP identified 12 privately operated water systems that fell within one mile (2,000 meters) of a study period mine. Table 15 shows the distribution of these 12 water systems by county. DEP contacted the operators of all 12 community water supply systems. None of the water system operators reported experiencing any mining related problems.

For the future, DEP will expand its survey efforts to include all railroads and privately operated water companies with facilities situated above mine permit areas. The evolution of DEP's Geographic Information System will enhance the ability to identify these types of facilities.

Table 15
Non-municipal Community Water Systems by County

County	No. of Community Water Systems Identified
Indiana	4
Clearfield	2
Somerset	2
Washington	1
Greene	1
Armstrong	1
Butler	1
TOTAL	12

Compliance History

During the period covered by the 1999 report, and up to the time of its publication, DEP had issued one order to force compliance with damage repair and water supply replacement requirements of Act 54. Since that time, DEP has issued five more orders. The six orders issued to date may be summarized as follows:

- One order to continue to provide temporary water.
- Four orders to repair or compensate for subsidence damage.
- One order to provide a permanent solution to a water supply case that had been ongoing for more than three years.

All of the preceding orders were issued to operators of longwall mines.

Observations Regarding Confidentiality Clauses in Agreements

The Citizens Advisory Council and various citizens groups have expressed concern regarding the effect of confidentiality arrangements on DEP's data gathering efforts. Some agreements between mine operators and property owners contain clauses prohibiting property owners from disclosing information about the terms of their settlements. The concern has been that these clauses, sometimes called "gag orders," would prevent property owners from providing information to DEP. There is considerable speculation regarding the pervasiveness of these confidentiality requirements.

To explore this issue, DEP asked property owners during the 1999 telephone survey if they had signed agreements preventing them from disclosing information about the claims or settlements. Conversations with the 224 individuals reached during the survey revealed no reports of confidentiality requirements. There were seven cases where property owners declined to provide any information

without explaining why. These cases may or may not represent situations involving confidentiality requirements. There was also one case where a DEP interviewer speculated that a confidentiality arrangement might have prevented collection of information on the resolution of a claim.

In June 1999, DEP identified seven cases involving confidentiality agreements with mine operators. If these cases are combined with the eight cases previously discussed, there are 15 cases that may be subject to confidentiality agreements. This means that DEP found 15 cases that may have involved confidentiality agreements after making 1,027 direct contacts with property owners (see Table 4 on page 8). Equally important is the fact that, irrespective of the status of confidentiality agreements, DEP was able to collect information on nearly 93 percent of the 1,884 properties in the original survey population (see discussion on page 7.) The role of confidentiality agreements among the remaining seven percent of the properties cannot be stated with certainty. It is notable, however, that many of these cases involved circumstances where the property owners did not respond to DEP's surveys and the mine operators had gone out of business, leaving no available source of information.

Observations Regarding Means of Water Supply Replacement

Another of the concerns raised by various citizens' groups was the extent to which mining is depleting the usable groundwater resources of mined areas. Their concerns stem from the observations that mine operators can buy affected properties, compensate property owners for water loss or replace water supplies via connections to public water supply systems that draw water from remote sources.

As indicated previously, there were cases where mine operators settled water supply cases by compensating property owners or purchasing the properties after mining. Table 9 on page 16 shows 31 longwall cases that were settled through agreement or compensation and one case that was settled by purchasing the property after mining. Table 12 on page 21 shows one room-and-pillar case that was settled through agreement or compensation. Altogether there were 33 cases that were reportedly settled through some form of compensation.

These two tables also present information on 258 cases (161 longwall cases and 97 room-and-pillar cases) that were settled by establishing permanent replacement supplies. DEP researched available information regarding these cases to determine the number of supplies that were replaced by wells or springs compared to the number of supplies that were replaced via connections to public water supply systems. In 134 of the 258 cases, DEP found that the water supplies were reestablished by deepening existing wells, drilling new wells or developing new springs. In 17 cases, water supplies were reestablished via connections to public water supply systems. In the remaining 107 cases, details regarding the means of replacement were not provided (reports simply indicated that the supplies were replaced).

As indicated in Table 6 and Table 9, there were also 54 cases where the final means of settlement were not disclosed. These cases may have been settled by developing on-site water resources, connecting to public water supply systems or through some form of compensation.

Observations Regarding the Cost of Damage

Another issue raised by the CAC, and subsequently reiterated by Representative Sara G. Steelman (D-Cambria and Indiana) at the legislative Coal Caucus hearing, was a desire to see a determination of the magnitude of damage experienced by properties that are undermined. Repair cost was recommended as a possible means of measuring the magnitude of damage. DEP had not previously attempted to collect such cost information from mine operators because of the restriction imposed by section 18.1(d) of Act 54. (DEP has, however, recently implemented procedures to gather cost information on a voluntary basis as described in the next section, *Improvements to Data Gathering Systems*).

While data has not been collected in a systematic fashion, for the sake of completeness DEP reviewed its files to identify any available information. The cost figures that were found are summarized in Table 16. Although there are not enough cases to reveal any meaningful statistics, the information is presented for the benefit of those interested in the available data.

Table 16
Summary of Cost of Damage to Structures (DEP Files)

Mine Type	Cost		Basis	Estimated by
	Individual	Group Average		
Longwall	\$109,990		EPACT	DEP/MSI
	\$60,977			
	\$100,250			
	\$98,250			
	\$5,269			
	\$1,323			
	\$150,250			
	\$84,400			
	\$31,583			
	\$210,128		Escrow Account	DEP/McMurray
	\$9,800			
	\$100,000			
\$66,000	\$79,094	Property Owner	Property Owner	
Room-and-pillar	\$16,810		EPACT	DEP/MSI
	\$9,950			\$13,380

Improvements to Data Gathering Systems

DEP has already made improvements to its data collection programs and is planning other improvements to enhance the quality of future reports. These improvements will help DEP address some of the concerns raised regarding the 1999 report.

Regulatory Changes

One improvement that has already been put in place is the requirement for mine operators to report all claims of water supply impacts and subsidence damage to DEP. This change was implemented on June 13, 1998, when amendments to 25 Pa. Code Chapter 89 went into effect.

25 Pa. Code 89.142a(k) sets forth the requirement to report all claims of structure damage and land damage. It requires that:

“Within 10 days of being advised of a claim of subsidence damage to a structure or surface feature, the operator shall provide the Department with a report of the claim which shall include the following information:

- (1) The date of the claim.*
- (2) The name, address and telephone number of the owner of the structure, surface feature or surface land claimed to be damaged.*
- (3) The number assigned to the structure or feature under §89.154(a) (relating to maps).”*

25 Pa. Code 89.145a(c) establishes the requirement to report all claims of water supply contamination, diminution or interruption. It requires that:

“Within 24 hours of an operator’s receipt of a claim of water supply contamination, diminution or interruption, the operator shall notify the Department of the claim.”

Changes in Report Forms

DEP has modified the form used by mine operators to report information on claims they receive. The revised form, which was put into use in February 2000, solicits information on the cost of compensation provided for repairing subsidence damage. It also asks for information on the cost and nature of any mitigation measures taken to reduce the level of damage sustained by the structure. To date, mine operators have not provided the requested cost information, and DEP is evaluating alternate means of obtaining this information.

Changes in Claims Database

The Claims Database has been modified to automatically identify cases that are pending resolution. Once entered, a case remains opened until it is closed. The system also allows for cases to be reopened in the event of additional problems. These changes enable DEP to identify and track cases and determine how long it takes for cases to reach final settlement.

Independent Studies

DEP is planning several independent, scientific studies to address concerns regarding the effects of longwall mining. These studies include:

- A study to determine the effects of longwall mining on overlying forestland.
- A study to evaluate the effects of longwall mining on streams, wetlands and riparian areas.
- A study to determine the effects of longwall mining on the value of overlying property.

The studies will be conducted by outside consultants under contract to DEP. The forestland study was awarded in March 2000 and has a scheduled completion date of March 31, 2001. The two other studies are in the planning stage and will be performed in the order listed, as funds are available. DEP's intent is to have all studies completed by the end of 2001.

Follow-up on Issues Identified in the 1999 Report

Content of this Section

This section presents DEP's findings regarding those cases that were targeted for follow-up investigations in the 1999 report. The section titled *Issues Resulting from Comments on the 1999 Report* on page 5 summarizes the results of all of the work that has been done to date. It incorporates both the results of additional investigations discussed in that section and the results of follow-up work described here. For the sake of continuity, this follow-up work is presented in detail since it was developed to fulfill DEP's commitment to prepare a supplementary report.

The information presented here pertains to cases from several resolution categories as described in the 1999 report. These categories included:

- Cases involving water supply impacts or structure damages that were first reported through the 1998 property owners' survey.
- Cases involving affected water supplies, structure or land damages, wherein circumstances were unclear based on the information collected.
- Cases involving water supply impacts and structure damages wherein resolutions were attempted but problems remain.
- Cases involving water supply impacts or structure damages wherein mine operators offered no corrective action or compensation.
- Cases involving water supply impacts or structure damage wherein liability was declined without DEP involvement.
- Cases involving stream-related impacts.

Follow-up Inquiries and Investigations

Additional information for this part of the supplement was collected through a combination of follow-up contacts and investigations. All cases involving water supply impacts and structure and land damages were initially pursued by writing to the property owners offering assistance in bringing their claims to resolution. Property owners who responded were contacted to obtain additional details regarding the nature of their problems and the status of resolutions. DEP's surface subsidence agents, engineers or hydrogeologists also made many site visits to collect additional information.

To encourage responses, DEP mailed a second letter to each property owner who did not respond to the first letter. Property owners who did not respond to the second letter were not contacted further. Cases in which property owners failed to respond were labeled, "*No response from property owner.*" They were assigned the final resolution, "*Current details unavailable*" or retained at their previous resolution status.

As part of the data collection, DEP’s surface subsidence agents also examined all perennial streams in areas that were undermined by longwall mining methods during the study period. The agents also investigated reports of stream impacts received via the property owners’ survey.

Updated Information Regarding Reports of Water Supply Impacts

Focus of Investigations

In conducting follow-up investigations of reported water supply impacts, DEP focused on cases that fell within five of the nine resolution categories depicted of Table X.4 of the 1999 report. These categories included “*Mine Operator not Liable*,” “*Claim Not Previously Reported*,” “*Status Unclear From Available Information*,” “*Resolution Attempted but Problems Remain*” and “*No Corrective Action or Compensation Offered*.” Statistics previously reported in these categories are shown in Table 17, which is a duplicate of Table X.4.

Table 17
Status of Reported Water Supply Claims (November 1998)

Current Status	Cases by Mine Type				% of Total
	Longwall	Room-and-pillar	Not known	Total	
<i>Completed</i>					
Permanent water supply reestablished	130	89	2	221	41%
Mine operator not liable	39	79	1	119	22%
Settled by agreement or compensation	28	4	1	33	6%
<i>Total completed</i>	<i>197</i>	<i>172</i>	<i>4</i>	<i>373</i>	<i>69%</i>
<i>Pending resolution</i>					
Property owners on temporary water	77	6		83	16%
Claim not previously reported	8	24		32	6%
Status unclear from available information	17	10		27	5%
Resolution attempted but problems remain	4	5		9	2%
Resolution pending	5	0		5	1%
No corrective action or compensation offered	2	2		4	1%
<i>Total pending resolution</i>	<i>113</i>	<i>47</i>		<i>160</i>	<i>31%</i>
TOTAL	310	219	4	533	100%

DEP Findings in Regard to Water Supply Cases

In November 1998, DEP had information relating to 533 cases of reported water supply impacts. Of these cases, 126 were targeted for follow-up investigation. The following discussion presents the updated findings regarding these cases. Information is organized around the resolution categories presented in the 1999 report.

Mine Operator not liable. In November 1998, there were 119 water supply cases that were reportedly settled by finding that the mine operators were not liable to restore or replace the water supplies. DEP had prior involvement in 65 of the 119 cases. In the other 54 cases, the determinations of no liability were made without DEP's involvement. In the 1999 report, DEP committed to making follow-up inquiries into a random sample of these 54 cases, but subsequently decided to investigate all 54 cases to provide a more accurate picture. DEP's findings regarding these cases are presented in Table 18.

Table 18
Updated Findings Relating to Water Supply Cases with Previous
Determinations of "No Liability"

Status	Cases
No response from property owner	26
Problem not due to underground mining	10
Problem predates Act 54 and EPACT	7
Water supply restored or replaced	5
Property owners on temporary water	4
Settled, means not disclosed	1
Mine operator and property owner negotiating	1
TOTAL	54

Findings for 10 of the cases indicated that conditions were not due to underground mining. In another six cases, problems were found to predate the water supply replacement provisions of state and federal law. Eleven of the cases were found to be resolved or on course to resolution with some type of remedy to the property owners. In 26 cases, property owners did not respond to DEP's inquiries or offers of assistance. These 26 cases were retained in the resolution category, "*Mine operator not liable.*"

Claim not previously reported. DEP committed to making follow-up investigations in all cases where property owners reported previously undisclosed problems on survey questionnaires. This effort involved all 32 cases listed in Table 17. DEP's findings regarding these cases are presented in Table 19.

Table 19
Updated Findings Relating to Cases That Were Newly Reported
at the Close of Data Collection in November 1998

Status	Cases
No response from property owner	13
Water supply restored or replaced	4
Property owners on temporary water	3
Mine operator and property owner negotiating	3
Problem not due to underground mining	2
Settled, means not disclosed	2
EPACT case	2
Water supply recovered	1
Problem predates Act 54 and EPACT	1
No actual problem	1
TOTAL	32

Status unclear from available information. In November 1998, there were 27 cases in which information was insufficient to describe the nature of effects or the status of resolutions. Most of these cases came from the property owners' survey. In many instances, property owners reported impacts but provided little or no information about claim resolutions. In a few cases, it was unclear whether the mine operator or the property owner had assumed responsibility for resolving the problem. Some questionnaires simply indicated that the problems were not resolved without providing additional details. Updated information regarding these cases is presented in Table 20.

Table 20
Updated Findings Regarding Water Supply Cases That Were
Listed as Unclear in November 1998

Status	Cases
Problem not due to underground mining	7
No response from property owner	4
Water supply restored or replaced	4
Property owners on temporary water	4
Problem predates Act 54 and EPACT	2
Settled, means not disclosed	1
Mine operator and property owner negotiating	1
Mine operator bought property*	1
No actual problem	1
Mine operator investigating	1
Settled by agreement	1
TOTAL	27

*This property was not among the 49 previously referenced as belonging to mine operators

Resolution attempted but problems remain. This category included cases where the operator had taken some action to resolve the problem or made a settlement offer that was unsatisfactory to the property owner. DEP committed to making follow-up investigations in all nine cases that fell within this category. Table 21 shows the latest information on these nine cases.

Table 21
Updated Findings Regarding Settled Water Supply Cases with Remaining Problems

Status	Cases
No response from property owner	4
EPACT case	2
Water supply restored or replaced	1
Property owners on temporary water	1
Settled by agreement	1
TOTAL	9

No corrective action or compensation offered. The status of this group of cases is shown in Table 22. This group of cases came entirely from the property owners' survey. In these cases, property owners indicated that the mine operators had refused to respond to their claims. There was no information in the Claims Database that could be relied upon to support or refute these reports. As a result, DEP committed to making follow-up investigations for all four cases in this category.

Table 22
Updated Findings Regarding Water Supply Cases with No Corrective Action or Compensation Offered as of November 1998

Status	Cases
No response from property owner	1
Problem not due to underground mining	1
Water supply restored or replaced	1
Settled, means not disclosed	1
TOTAL	4

Revised Tabulation of Water Supply Resolutions

Table 23 presents an updated summary of the resolutions for the 533 water supply cases that were presented in the 1999 report. This table shows the current status of all cases as of Oct. 1, 1999, the completion date for follow-up investigations. Table 23 includes several new resolution categories for purposes of classifying the information obtained. The table also includes figures from Table X.4 of the 1999 report to show the reassignment of cases in the former categories “*Claim not previously reported,*” “*Status unclear from available information,*” “*Resolution attempted but problems remain*” and “*No corrective action or compensation offered.*” The category “*Pending Resolution*” has been renamed “*In process*” to reflect the possibility that a satisfactory resolution may not be imminent and to make the table consistent with those presented in the first section of this report.

In incorporating the new information into Table 23, several “resolutions” that were discussed earlier were grouped into the broader resolution categories. The resolutions, “*Problem not due to underground mining*” and “*Problem predates Act 54 and EPACKT*” were incorporated into the general category, “*Mine operator not liable.*” The resolution, “*Water supply recovered*” was incorporated into the general category “*Permanent water supply reestablished.*” The resolution, “*Operator bought property*” was incorporated into the general category, “*Settled by agreement or compensation.*” The resolution, “*Operator and property owner negotiating*” was incorporated into the general category, “*Claim in process.*”

At the conclusion of the follow-up investigations, 75 percent of water supply cases were resolved. Another 20 percent were at various stages in the resolution process. In four percent of cases, property owners did not provide information needed to update the status of their cases. The remaining one percent of cases had either been referred to OSM or were being investigated.

Table 23
Status of Reported Water Supply Cases at the Close of Follow-up Investigations

Status	Previous Number	Revised Number	Revised %
<i>Completed</i>			
Permanent water supply reestablished	221	237	44%
Mine operator not liable	119	121	23%
Settled by agreement or compensation	33	35	7%
Settled, means not disclosed	-	5	1%
No actual problem	-	2	0%
Mine operator bought property		1	0%
<i>Completed Subtotal</i>	373	401	75%
<i>In process (formerly "Pending Resolution")</i>			
Property owners on temporary water	83	95	18%
Claim in process	5	10	2%
<i>In Process Subtotal</i>	88	105	20%
<i>Other resolutions</i>			
EPACT cases		4	1%
Mine operator investigating		1	0%
<i>Other Resolutions Subtotal</i>		5	1%
<i>Current details unavailable</i>			
From cases not previously reported	32	13	2%
From cases where status was unclear	27	4	1%
From cases with remaining problems	9	4	1%
From cases where no remedy was offered	4	1	0%
<i>Current Details Unavailable Subtotal</i>	72	22	4%
TOTAL	533	533	100%

Note: Percentage total may differ from sum of components because of individual rounding

Updated Information Regarding Reports of Structure Damage

Focus of Investigations

Follow-up investigations of structure damage cases, focused on five of the 11 resolution categories depicted of Table XI.3 of the 1999 report. These categories included "Mine operator not liable," "Claim status or outcome under dispute," "Status unclear from available information," "Claim not previously reported," and "No repair or compensation offered." Statistics regarding these and other resolution categories are shown in Table 24, which is a copy of Table XI.3 from the 1999 report.

Table 24
Status of Reported Structure Damage Cases (November 1998)

Resolution	Claim by Mining Type				% of Total
	Longwall	Room-and-pillar	Not Known	Total	
<i>Completed</i>					
Settled by agreement	52	1	2	55	20%
Damaged structure repaired or replaced	47	3		50	18%
Structure owner compensated	38	6		44	16%
Mine operator not liable	21	7		28	10%
Claim settled under MSI program	1	0		1	0%
Damage insignificant	0	1		1	0%
<i>Total Completed</i>	<i>159</i>	<i>18</i>	<i>2</i>	<i>179</i>	<i>64%</i>
<i>Pending Resolution</i>					
Interim phase of resolution	36	3		39	14%
Claim status or outcome under dispute	17	2		19	7%
Status unclear from available information	17	2	1	20	7%
Claim not previously reported	8	6		14	5%
No repair or compensation provided	4	5		9	3%
<i>Total Pending Resolution</i>	<i>82</i>	<i>18</i>	<i>1</i>	<i>101</i>	<i>36%</i>
Totals	241	36	3	280	100%

DEP Findings in Regard to Structure Damage Cases

In November 1998, information was available on 280 reported cases of structure damage. Of these cases, 72 were targeted for follow-up investigation. The following discussion presents updated findings regarding these cases. Information and revised statistics are organized by resolution category.

Mine Operator not liable. At the close of data collection for the 1999 report there were 28 reported cases with the resolution “*mine operator not liable.*” DEP had been involved in 18 of these cases and arrived at the same conclusion. DEP felt it appropriate to investigate the other 10 cases to see if it concurred with the operators’ determinations of no liability.

Table 25 shows DEP’s findings for the 10 cases targeted for follow-up investigations. Four of the cases have now been resolved through agreement, repair or compensation. In one additional case, the mine operator and property were in the process of negotiating a settlement. One case was retained at “*No liability*” status because the damage was not due to mining. There were also four cases where property owners could not be contacted for follow-up inquiry because DEP could not find current mailing addresses or telephone numbers despite repeated attempts.

Table 25
Updated Findings Relating to Structure Damage Cases with
Previous Determinations of “No Liability”

Status	Cases
Problem not due to underground mining	1
Settled by agreement	2
Damaged structure repaired or replaced	1
Structure owner compensated	1
Mine operator and property owner negotiating	1
No address or telephone number for follow-up contact	4
TOTAL	10

Claim status or outcome under dispute. The data collected for the 1999 report showed 19 cases in which the status or outcome was under dispute. The cases generally involved situations where mine operators and property owners could not come to terms regarding the scope of damage, the amount of compensation, the method of repairs or the contract who would perform the repair work. Updated information regarding these cases is presented in Table 26.

Table 26
Updated Findings Relating to Structure Damage Cases Where
Claim Status or Outcome Was Disputed (November 1998)

Status	Cases
No response from property owner	6
Settled by agreement	5
Mine operator and property owner negotiating	3
Settled, means not disclosed	2
Damage not due to underground mining	1
Claim not filed within two-year limit established by Act 54	1
In litigation	1
TOTAL	19

Status unclear from available information. In November 1998, there were 20 cases in which circumstances were not sufficiently clear to report a resolution status. Through follow-up investigations DEP was able to obtain additional details on these cases. Updated findings are shown in Table 27.

Table 27
Updated Findings Regarding Structure Damage Cases
That Were Unclear in November 1998

Status	Cases
No response from property owner	6
Settled by agreement	2
Structure owner compensated	1
Settled, means not disclosed	1
Mine operator and property owner negotiating	4
Damage not due to underground mining	4
Damage occurred prior to Act 54 and EPACT	1
No actual problem	1
TOTAL	20

Claim not previously reported. The 1998 property owners' survey turned up 14 new cases of structure damage that had not been previously reported to either DEP or the mine operators. DEP sent letters to all 14 property owners offering to investigate their cases and assist in resolving damage claims. Additional details regarding these cases appear in Table 28.

Table 28
Updated Findings Relating to Structure Damage Cases That Were
First Reported During the 1998 Property Owners' Survey

Status	Cases
No response from property owner	5
Settled by agreement	1
Mine operator and property owner negotiating	4
Damage not due to underground mining	2
EPACT case	1
Damage occurred prior to Act 54 and EPACT	1
TOTAL	14

No repair or compensation provided. Data collected from the 1998 property owners' survey also revealed nine cases where mine operators reportedly offered no repair or compensation in regard to the property owners' claims of structure damage. All nine of these cases were targeted for follow-up investigations. Updated information relating to these cases is presented in Table 29.

Table 29
Updated Findings Regarding Disposition of Structure Damage
Cases in Which No Corrective Action or Compensation was
Offered as of November 1998

Status	Cases
No response from property owner	1
Settled by agreement	1
Structure owner compensated	1
Mine operator and property owner negotiating	1
EPACT case	1
Damage not due to underground mining	3
No actual problem	1
TOTAL	9

Revised Tabulation of Structure Damage Resolutions

Table 30 provides an updated accounting of reported structure damage cases after completion of follow-up investigations. The table includes several new resolution categories for purposes of classifying new acquired information. It also includes figures from Table X.4 of the 1999 report to show the reassignment of cases in former categories “*Claim status or outcome under dispute,*” “*Status unclear from available information,*” “*Claim not previously reported,*” and “*No repair or compensation offered.*”

In incorporating the new information in to Table 30, several “resolutions” which appear in Tables 25 through 29 were grouped into the broader resolution categories. The resolutions, “*Problem not due to underground mining*” and “*Damage occurred prior to Act 54 and EPACT,*” were incorporated into the general category, “*Mine operator not liable.*” The resolution, “*Operator and property owner negotiating*” was incorporated into the general category, “*Claim in process.*” Other resolution categories are self-explanatory.

Table 30
Status of Reported Structure Damage Cases at the Close of Follow-up
Investigations (October 1999)

Resolution	Previous Number	Revised Number	Revised %
<i>Completed</i>			
Settled by agreement	55	66	24%
Damaged structure repaired or replaced	50	51	18%
Structure owner compensated	44	47	17%
Mine operator not liable	28	35	13%
Settled, means not disclosed	-	3	1%
No actual damage	-	2	1%
Damage insignificant or nonexistent	1	1	0%
<i>Completed Subtotal</i>	<i>178</i>	<i>205</i>	<i>73%</i>
<i>In Process (formerly "Pending Resolution")</i>			
Claim in process	39	52	19%
<i>In Process Subtotal</i>	<i>39</i>	<i>52</i>	<i>19%</i>
<i>Other Resolutions</i>			
EPACT case	-	2	1%
Claim settled under MSI program	1	1	0%
Claim not reported within 2 years	-	1	0%
In litigation	-	1	0%
<i>Other Resolutions Subtotal</i>	<i>1</i>	<i>5</i>	<i>2%</i>
<i>Current details unavailable</i>			
From <i>Outcome in Dispute</i>	19	6	2%
From <i>Status Unclear</i>	20	6	2%
From <i>Not Previously Reported</i>	14	5	2%
From <i>No Repair or Compensation Offered</i>	9	1	0%
<i>Current Details Unavailable Subtotal</i>	<i>62</i>	<i>18</i>	<i>6%</i>
Totals	280	280	100%

Note: Percentage total may differ from sum of components because of individual rounding

After processing all information obtained through follow-up information and inquiries, DEP found that there were still 18 cases that could not be easily classified. DEP decided to classify this group of cases as "Current details unavailable." These cases all represent situations where the property owners failed to respond to DEP's letters of inquiry (although there were five cases where DEP was unable to find an address or telephone number). These cases were derived from the categories: "Claim status or outcome under dispute," "Status unclear from available information," "Claim not previously reported," and "No repair or compensation offered." (Cases

in the category “*Mine operator not liable*” were retained in that category if the property owners failed to respond.) The follow-up investigations were successful in reducing the number of cases in the four categories from 62 to 18.

At the conclusion of the follow-up investigations, 73 percent of structure damage cases were resolved. Another 19 percent were at various stages in the resolution process. In six percent of cases, information was unavailable to update the status. The remaining two percent of cases involved special resolutions or circumstances.

Updated Information Regarding Reports of Land Damage

Overview of Land Damage Cases

At the close of data collection in November 1998, the status and resolutions of many reported land damage cases were unclear. In many cases, reports of remedial action focused on structure damage and included little, if any, information on the treatment of land damage. Due to this lack of information, DEP did not include a tabulation of land damage resolutions in the 1999 report. DEP did, however, commit to conducting follow-up investigations into as many of these cases as possible.

In November 1998, DEP had reports of land damage associated with 150 properties. As explained in the 1999 report, there were 195 incidents of land damage associated with these properties because some properties had more than one type of land damage. In selecting properties for follow-up inquiries and investigations, DEP focused on properties that also had structure or water supply impacts and properties where land damage was reportedly not repaired.

DEP Findings in Regard to Land Damage Cases

Table 31 shows the final status and resolutions of land damage cases that were reported in time for inclusion in the 1999 report. The table also incorporates figures from those case histories that were complete at the time of DEP’s earlier data collection efforts. Since the 1999 report did not include a compilation of land damage resolutions, Table 31 does not include previous summary figures for the various resolution categories.

As shown in the table, details were obtained on 115 of the 150 properties that were reported to have some type of land damage. Most of the resolution categories are self-explanatory or have been described previously in this report. It is notable that there was one incident where a ground crack was reported to have healed on its own. It is also notable that all but one of the reports from the resolution category “*Mine operator not liable*” were found to be unrelated to underground mining.

There were also eight cases where damage was found to be either nonexistent or insignificant. In four of these cases, damage had been recorded by mistake. In two cases, DEP investigators found

no observable damage. In the remaining two cases, the property owner viewed the damages as insignificant.

As shown in Table 31, 46 cases were resolved by repairing the land damage and 15 were settled through agreements or by providing compensation to the property owners. Twenty-eight cases are in the process of being resolved. One case was settled through purchase of the affected property. There was also one case where the resolution was being pursued through litigation and one case that was being investigated by the mine operator.

Table 31
Updated Findings Relating to Reported Land Damage Cases (October 1999)

Resolution	No. of Cases
<i>Completed</i>	
Repaired	46
Settled by agreement	11
Mine operator not liable	9
No actual damage	6
Settled, means not disclosed	5
Property owner compensated	4
Damage insignificant	2
Ground crack healed	1
Mine operator bought property	1
<i>Completed Subtotal</i>	85
<i>In Process (formerly "Pending Resolution")</i>	
Interim phase of resolution	28
<i>In Process Subtotal</i>	28
<i>Other Resolutions</i>	
In litigation	1
Operator investigating	1
<i>Other Resolutions Subtotal</i>	2
Total	115

At the conclusion of the follow-up investigations, 85 of the 115 land damage cases were resolved. Another 28 cases were at various stages in the resolution process.

Updated Information Regarding Reported Effects on Streams

Overview

At the close of data collection for the 1999 report, DEP had information relating to potential effects on 25 streams. Of these reports, 16 came from the property owners' survey and nine cases from observations by DEP's surface subsidence agents. Since most of the property owners' questionnaires did not include the identity of the streams, it was impossible to determine the extent of overlap between these respective groups without additional investigation. In order to develop a final list, DEP identified the streams referenced by the property owners' questionnaires and compared those streams to the ones listed in the surface subsidence agents' reports.

Initially, it was also unclear how many of the 25 streams were perennial. A stream must be perennial (i.e., flow year round) in order to qualify for protection and restoration under DEP's regulations. While the surface subsidence agents limited their reports to streams identified as perennial in permit applications, there was no indication that property owners' reports were limited in the same way. In one case, a property owner described the affected stream as intermittent (i.e., a stream that goes dry periodically due to natural conditions). As part of its follow-up investigations, DEP looked at whether or not the streams in question were documented to be perennial using the flow-based criterion.

In conducting supplementary investigations, DEP also examined all perennial streams that were undermined by longwall mining methods during the study period. The objective was to identify effects that may have been missed during previous data collection efforts.

DEP Findings in Regard to Reports of Effects on Streams

Table 32 shows the final list of perennial streams that were affected by underground mining during the study period. There were nine cases where streams exhibited pooled conditions due to mine subsidence. There were also four cases where streams experienced flow diminution and two cases where streams exhibited both diminution and pooling.

In regard to restoration, mine operators have regraded two segments along Enlow Fork and Templeton Run to eliminate excessive pooling. DEP continues to monitor the other streams so that it can take appropriate action if there is a need for remedial action in the future. In addition, DEP has solicited proposals for an independent, professional study of the effects of longwall mining on streams, wetlands and riparian areas.

Table 32 does not include many reported effects on streams that, upon investigation, turned out to be intermittent. There were nine cases that fell into this category. Within this group, there were five reports of diminution, two reports of pooling and two reports of diminution combined with pooling or diversion. In one case, a property owner who previously filed a report of diminution withdrew it.

Table 32
Findings Relating to Reported Effects on Streams

Name	County	Observed Effects
Smith Creek	Greene	Diminution
Enlow Fork	Greene	Pooled Diminution
Patterson Run	Greene	Diminution
Hoover Run	Greene	Pooled
Rocky Run	Greene	Pooled
Robinson Run	Greene	Pooled
Muddy Creek	Greene	Pooled
Templeton Fork	Greene	Pooled
Tom's Run	Greene	Pooled
Whiteley Creek	Greene	Pooled
Pursley Creek	Greene	Pooled
Unnamed stream	Washington	Pooled
Unnamed stream	Washington	Pooled Diminution
Unnamed stream	Washington	Diminution
Unnamed stream	Indiana	Diminution

This publication and related environmental information are available electronically via Internet. For more information, visit us through the Pennsylvania homepage at <http://www.state.pa.us> or visit DEP directly at <http://www.dep.state.pa.us> (choose directLINK “Act 54”).



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