REGULATORY ECONOMIC ANALYSIS

FOR

CRITERIA AND PROCEDURES FOR PROPOSED ASSESSMENT OF CIVIL PENALTIES: FINAL RULE

U.S. Department of Labor
Mine Safety and Health Administration
Office of Standards, Regulations, and Variances

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I. EXECUTIVE SUMMARY

INTRODUCTION

This Regulatory Economic Analysis (REA) examines the costs and benefits of MSHA's final rule to revise its civil penalty assessment regulations by eliminating single penalties, revising the assignment of points for regular assessments, and implementing MINER Act requirements. The final rule increases penalties for most violations.

MINE SECTORS AFFECTED

The final rule will be applicable to all coal and metal/nonmetal (M/NM) mines subject to MSHA's jurisdiction. A description of the mine sectors covered by the final rule is provided in Chapter II of this REA.

POPULATION AT RISK

Based on 2005 data, the final rule will apply to the entire mining industry, covering all 14,666 mine operators and 6,585 independent contractors in the United States, as well as the 261,449 miners and 83,267 contractor workers they employ.

BENEFITS

Chapter III of this REA discusses the incentive effect of the final rule to reduce accidents, injuries, and illnesses as a result of improved compliance with MSHA's safety and health standards and regulations in response to increased penalty assessments.

COMPLIANCE COSTS

MSHA estimates in Chapter IV of this REA that the final rule will result in net increased costs to the mining industry of approximately $31.6 million annually. Of these, increased penalty costs to the mining industry will account for approximately $22.1 million annually. These penalty increases will be accompanied by increased yearly expenditures of approximately $9.5 million to improve compliance with existing MSHA standards and regulations. In addition, a new provision requiring a written request for a safety and health conference has an annual total cost of approximately $0.1 million. The total cost of the final rule is approximately $25.1 million yearly for coal mining and approximately $6.5 million yearly for metal/nonmetal (M/NM) mining. The average yearly cost is $12,151 per coal mine and $517 per M/NM mine. MSHA has determined that the final rule is both technologically and economically feasible.

EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ACT

Executive Order 12866 requires that regulatory agencies assess both the costs and benefits of proposed regulations. MSHA has fulfilled this requirement for the final rule. Executive Order 12866 classifies a rule as a significant regulatory action requiring review by the Office of Management and Budget if it meets any one of a number of specified conditions, including: having an annual effect on the economy of $100 million or more, creating a serious inconsistency or interfering with an action of another agency, materially

altering the budgetary impact of entitlements or the rights of entitlement recipients, or raising novel legal or policy issues. MSHA has determined that, based on the REA, the final rule would not have an annual effect of $100 million or more on the economy and, therefore, would not be an economically significant regulatory action under Section 3, paragraph (f) of Executive Order 12866. MSHA, however, has concluded that the final rule is otherwise significant under Executive Order 12866 because it raises novel legal or policy issues.

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's impact on small entities. The Small Business Administration (SBA) provides criteria to define a small business entity. For the mining industry, SBA defines "small" as a mine with 500 or fewer employees. MSHA traditionally has considered small mines to be those with fewer than 20 employees. For the final rule, MSHA has included the impact of the rule on mines with five or fewer employees to ensure that this subset of mines is not significantly and adversely impacted. To ensure that the final rule conforms to the RFA, MSHA has analyzed the impact of the rule on mines with 500 or fewer employees. MSHA has determined that the rule will not impose a significant cost increase on small mines, whether a small mine is defined as one with 500 or fewer employees or one with fewer than 20 employees. Based upon this analysis, the Agency has determined that the rule will not have a significant economic impact on a substantial number of small mines. The factual basis for this determination is discussed in Chapter V of this REA.

II. INDUSTRY PROFILE

INTRODUCTION

This chapter provides information concerning the structure and economic characteristics of the mining industry, including the number of mines and employees by type and size of mine.

The value of the U.S. mining industry's coal and metal and nonmetal (M/NM) output was estimated to be approximately $78.2 billion, or 0.63 percent of 2005 Gross Domestic Product (GDP). Coal mining contributed an estimated $26.7 billion to the GDP,[1] while the M/NM mining sector contributed an estimated $51.5 billion.[2]

STRUCTURE OF THE MINING INDUSTRY

MSHA divides the mining industry into two major sectors based on commodity: (1) coal mines and (2) M/NM mines. Each sector is further divided by type of operation (e.g., underground mines or surface mines). The Agency maintains data on the number of mines and on mining employment by mine type and size. MSHA also collects data on the number of independent contractor firms and their employees. Each independent contractor is issued one MSHA contractor ID and may work at any mine.

MSHA generally groups mines into three different categories based on employment: 1-19 employees; 20-500 employees; and 501+ employees.[3] For rulemaking purposes, the Agency has traditionally defined a small mine to be one employing 1-19 employees and a large mine to be one employing 20 or more employees. However, to comply with the requirements of the SBREFA amendments to the Regulatory Flexibility Act (RFA), MSHA must use the Small Business Administration's (SBA's) criteria for a small entity when determining a rule's economic impact. For the mining industry, SBA defines a small mine as one with 1-500 employees and a large mine as one with 501+ employees.

Table II-1 presents the total number of coal mines, by mine type and employment size, excluding contractors. It shows that approximately 32 percent of all coal mines are underground mines, which employ approximately 52 percent of all coal miners (excluding office employees), while 68 percent of all coal mines are surface mines, which employ roughly 48 percent of all coal miners (excluding office employees).

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[1] Coal production data are from U.S. Department of Labor (DOL), Mine Safety and Health Administration (MSHA), Office of Program Evaluation and Information Resources (PEIR), 2005 data. The average U.S. price of underground and surface coal for 2005 is from the Department of Energy (DOE), Energy Information Administration (EIA), *Annual Coal Report 2005*, October 2006, Table 28, page 56.

[2] U.S. Department of the Interior (DOI), U.S. Geological Survey (USGS), *Mineral Commodities Summaries 2006*, January 2006, p. 8.

[3] For the penalty and cost provisions in this REA, the mine size category 1-19 employees has been further disaggregated into mines with 1-5 employees and mines with 6-19 employees.

Table II-1: Distribution of Coal Mines (Excluding Contractors) by Mine Type and Employment Size, 2005

Mine Type	Size of Coal Mine									All Coal Mines		
	1-19 Employees			20 to 500 Employees			501+ Employees					
	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.
Underg.	232	2,238	77	424	32,560	943	10	6,121	137	666	40,919	1,157
Surface	914	5,596	450	481	28,916	1,942	4	2,810	61	1,399	37,322	2,453
Total	1,146	7,834	527	905	61,476	2,885	14	8,931	198	2,065	78,241	3,610

Source: U.S. DOL, MSHA, PEIR.

Table II-2 presents the total number of M/NM mines, by mine type and employment size, excluding contractors. The M/NM mining segment consists of metal mines (copper, iron ore, gold, silver, etc.) and nonmetal mines (stone including granite, limestone, dolomite, sandstone, slate, and marble; sand and gravel; and others such as clays, potash, soda ash, salt, talc, and pyrophyllite). As Table II-2 indicates, approximately 98 percent of all M/NM mines are surface mines that employ approximately 91 percent of M/NM miners (excluding office employees), and approximately 2 percent of all M/NM mines are underground mines that employ approximately 9 percent of M/NM miners (excluding office employees).

Table II-2: Distribution of M/NM Mines (Excluding Contractors) by Mine Type and Employment Size, 2005

Mine Type	Size of M/NM Mine									All M/NM Mines		
	1-19 Employees			20 to 500 Employees			501+ Employees					
	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.
Underg.	118	840	144	119	9,543	1,064	5	3,189	143	242	13,572	1,351
Surface	10,702	52,940	10,384	1,641	75,699	12,794	16	11,295	1,563	12,359	139,934	24,741
Total	10,820	53,780	10,528	1,760	85,242	13,858	21	14,484	1,706	12,601	153,506	26,092

Source: U.S. DOL, MSHA, PEIR.

Table II-3 presents data on the number of independent contractors that worked in coal and M/NM mines in 2005. With respect to contractors that work in coal mines, Table II-3 shows the following: approximately 83 percent have 1-19 employees and employ approximately 28 percent of contractor employees (excluding office employees); almost 17 percent of contractors have 20 to 500 employees and employ approximately 69 percent of all contractor employees (excluding office employees); and approximately 0.1 percent of contractors have 501+ employees and employ approximately 3 percent of all contract employees (excluding office employees).

With respect to contractors that work in M/NM mines, Table II-3 shows the following: approximately 86 percent have 1-19 employees and employ approximately 38 percent of contractor employees (excluding office employees); almost 14 percent of contractors have 20 to 500 employees and employ approximately 56 percent of all contractor

employees (excluding office employees); and approximately 0.1 percent of contractors have 501+ employees and employ approximately 6 percent of all contract employees (excluding office employees).

Table II-3: Distribution of Coal and M/NM Contractors by Employment Size, 2005

Contr. Type	Size of Coal and M/NM Contractor									All Coal and M/NM Contractors		
	1-19 Employees			20 to 500 Employees			501+ Employees					
	Firms	Non-Office Empl.	Office Emp.	Firms	Non-Office Empl.	Office Emp.	Firms	Non-Office Empl.	Office Emp.	Firms	Non-Office Empl.	Office Emp.
Coal	2,068	9,216	613	432	22,548	1,286	3	875	7	2,503	32,639	1,906
M/NM	3,711	17,550	665	580	26,101	1,402	6	2,972	32	4,297	46,623	2,099
Total *	5,680	26,766	1,278	899	48,649	2,688	6	3,847	39	6,585	79,262	4,005

Source: U.S. DOL, MSHA, PEIR.

* Total number of independent contractor firms does not equal the sum for coal and M/NM because some independent contractor firms work in both coal and M/NM mines.

STRUCTURE OF THE COAL MINING INDUSTRY

Agency data in Table II-1 indicate that there were 2,065 coal mines that reported production during some portion of calendar year 2005. When applying MSHA's small mine definition (1-19 employees), 1,146 (approximately 56 percent) were small mines and 919 (approximately 44 percent) were large mines. Using SBA's small mine definition, 14 mines (0.6 percent) were large mines and the rest were small mines.

Coal mine employment in 2005 was 81,851, of which 78,241 were miners and 3,610 were office employees. Based on MSHA's small mine definition, 8,361 employees (10 percent) worked at small mines and 73,490 employees (90 percent) worked at large mines. Using SBA's small mine definition, 72,722 employees (89 percent) worked at small mines and 9,129 employees (11 percent) worked at large mines. Based on the Agency's small mine definition, on average, each small coal mine has 7 employees and each large coal mine has 80 employees. Using SBA's small mine definition, on average, each small coal mine has 36 employees and each large coal mine has 652 employees.

ECONOMIC CHARACTERISTICS OF THE COAL MINING INDUSTRY

MSHA classifies the U.S. coal mining sector into three major commodity groups: bituminous, lignite, and anthracite.[4] Bituminous operations represent approximately 91% of

[4] This categorization is based on MSHA-collected data grouped by SIC code description. Some publications of the U.S. Department of Energy further divide the bituminous group into bituminous coal and sub-bituminous coal. Other publications from MSHA combine lignite coal with bituminous coal.

coal mining operations, employ 94% of all coal miners, and account for 92% of total coal production. Lignite operations represent approximately 1% of coal mining operations, employ 4% of all coal miners, and account for 7% of total coal production. Anthracite operations represent approximately 7% of coal mining operations, employ 1% of all coal miners, and account for 0.1% of total coal production.[5]

The U.S. coal sector produced an estimated 1.13 billion short tons of coal (0.765 billion tons at surface mines and 0.368 billion tons at underground mines) in 2005. The average price of coal at surface and underground mines was $17.37 and $36.42 per ton, respectively.[6] Surface coal mines accounted for $13.3 billion of revenues and underground coal mines accounted for $13.4 billion, for a total of $26.7 billion. Based on MSHA's definition, small mines produced 28.6 million tons, valued at approximately $0.657 billion. Based on SBA's definition, small mines produced 851 million tons, valued at $20.5 billion. [7]

Mines east of the Mississippi River accounted for approximately 44 percent of coal production in 2005. For the period 1949 through 2005, coal production east of the Mississippi River ranged from a low of 413 million tons in 1960 to a high of 630 million tons in 1990; 2005 production was estimated at 493 million tons. Coal production west of the Mississippi ranged from a low of 21 million tons in 1960 to an estimated record high of 640 million tons in 2005.[8] Growth in western coal mines is due, in part, to environmental concerns that increase demand for low-sulfur coal, which is abundant in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

Average domestic coal prices (nominal and real prices) for the period 1950-2005 are presented in Table II-4. The nominal price is the actual price received. The real price is the price adjusted for inflation by using constant dollars from a particular year (in Table II-4, the year is 2000). During this period the real price of coal has generally declined. The only exceptions were a spike during the OPEC petroleum price increases in the 1970s and increases since 2000. The estimated real price of coal in 2005 was approximately 31 percent lower than in 1950.[9] The estimated real price of coal per Btu was approximately 15 percent lower in 2005 than in 1950, making coal the least expensive of the major fossil fuels in terms of dollars per Btu.[10]

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[5] Based on 2005 data from U.S. DOL, MSHA, PEIR.

[6] Coal prices are the average open market sales prices for 2005. U.S. DOE, EIA, *Annual Coal Report* 2005, October 2006, Table 28, p. 56.

[7] Coal production obtained from U.S. DOL, MSHA, PEIR, 2005 data. Average U.S. coal price estimates obtained from the DOE, EIA, *Annual Coal Report* 2005, October 2006, Table 28, p. 56. Underground and surface coal revenues were separately computed, then summed to obtain total coal revenue.

[8] U.S. DOE, EIA, *Annual Energy Review 2005*, July 2006, Table 7.2, p. 207.

[9] Ibid., Table 7.8, p. 219.

[10] Ibid., Table 3.1, p. 67. Per Btu, coal energy was more expensive than natural gas energy in 1950, but since 1979 has been less expensive. Both coal and gas energy were less expensive than crude oil energy in 1950 and have remained less expensive in every year since then.

Table II-4: Coal Prices 1950-2005
(Dollars per Short Ton and Dollars per Million Btu)

Year	Nominal Price (Dollars/Short Ton)	Real Price (2000 Dollars/Short Ton)	Nominal Price (per Million Btu)	Real Price (Year 2000 Dollars per Million Btu)
1950	5.19	31.40	0.21	1.25
1955	4.69	25.02	0.19	0.99
1960	4.83	22.96	0.19	0.92
1965	4.55	20.19	0.18	0.82
1970	6.34	23.03	0.27	0.87
1975	19.35	50.92	0.85	2.22
1980	24.65	45.61	1.10	2.04
1985	25.20	36.15	1.15	1.65
1990	21.76	26.67	1.00	1.22
1991	21.49	25.45	0.99	1.17
1992	21.03	24.34	0.97	1.12
1993	19.85	22.46	0.93	1.05
1994	19.41	21.50	0.91	1.01
1995	18.83	20.44	0.88	0.96
1996	18.50	19.71	0.87	0.92
1997	18.14	19.01	0.85	0.89
1998	17.67	18.32	0.83	0.86
1999	16.63	16.99	0.79	0.81
2000	16.78	16.78	0.80	0.80
2001	17.38	16.97	0.83	0.82
2002	17.98	17.26	0.87	0.84
2003	17.85	16.79	0.87	0.82
2004	19.93	18.27	0.98	0.89
2005	24.12	21.51	1.19	1.06

Source: DOE, EIA, *Annual Energy Review 2005*, July 2006, Table 7.8, p. 219; Table 3.1, p.67.

COAL MINING INDUSTRY OUTLOOK

The U.S. coal industry has enjoyed a fairly steady domestic demand, historically following the growth of electrical power demand of approximately 1.2 percent a year. Approximately 92 percent of U.S. coal demand was accounted for by electric power producers in 2005.[11] Domestic coal demand is projected to increase because of growth in coal used for electricity generation. Coal consumption for electricity generation is projected to increase, on average, by 1.6 percent per year from 2005 to 2025 as the utilization of existing coal-fired generation capacity increases and as new capacity is added.[12]

[11] U.S. DOE, EIA, *Annual Energy Review 2005*, July 2006, Table 7.3, p. 209.

[12] U.S. DOE, EIA, *Annual Energy Outlook 2005*. February 2005, p. 108.

THE STRUCTURE OF THE METAL/NONMETAL MINING INDUSTRY

The M/NM mining sector consists of approximately 80 different commodities including industrial minerals. There were 12,601 M/NM mines in the U.S. in 2005, of which 10,820 (86%) were small mines and 1,781 (14%) were large mines, using MSHA's traditional definition of small and large mines. Based on SBA's definition, however, only 21 M/NM mines (0.17%) were large mines.[13]

As shown in Table II-2, employment at M/NM mines in 2005 was 179,598, of which 153,506 were miners and 26,092 were office employees. Using MSHA's small mine definition, 64,308 employees (36%) worked at small mines and 115,290 employees (64%) worked at large mines. Based on SBA's small mine definition, however, 163,408 employees (91%) worked at small mines and 16,190 employees (9%) worked at large mines. Using MSHA's small mine definition, there is an average of 6 employees at a small M/NM mine and 65 employees at a large M/NM mine. Using SBA's definition, there is an average of 13 employees in each small M/NM mine and 771 employees in each large M/NM mine.[14]

Metal Mining

There are approximately 24 metal commodities mined in the U.S. Underground metal mines use a few basic mining methods, such as room and pillar and block caving, but all these mines, small and large, rely heavily on diesel-powered production and support equipment. All surface metal mines normally do drilling, blasting, loading, and hauling. Surface metal mines in the U.S. rank among some of the largest mines in the world.

Metal mines constitute 2 percent of all M/NM mines and account for 17 percent of all M/NM employment. Under MSHA's traditional definition of a small mine, 54 percent of metal mines are small and account for 3 percent of employment in metal mines. Using SBA's definition, 93 percent of metal mines are small and account for 54 percent of employment in metal mines.[15]

Stone Mining

Stone mining in the U.S. is predominantly done by quarrying, with only a few slight variations. Crushed stone mines typically drill and blast, while dimension stone mines generally use channel burners, drills, or wire saws. Diesel powered-haulage is used to transfer the broken rock from the quarry to the mill where crushing and sizing are done.

Stone mines constitute 36 percent of all M/NM mines, and account for 45 percent of all M/NM employment. Using MSHA's definition of a small mine, 76 percent of stone mines are small and account for 32 percent of employment in stone mines. Using SBA's definition, 99.98 percent of stone mines are small and account for 99 percent of employment in stone mines.[16]

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[13] U.S. DOL, MSHA, PEIR, calendar year 2005 data.

[14] Ibid.

[15] Ibid.

[16] Ibid.

Sand & Gravel Mining

All sand and gravel mining is surface mining. The mines generally extract with dredges or draglines. Further preparation involves washing and screening. Sand and gravel operations use diesel-driven machines, such as front-end loaders, trucks, and bulldozers, for haulage. The preparation of industrial sand and silica flour involves the use of crushers, ball mills, vibrating screens, and classifiers.

The sand and gravel subsector represents the single largest commodity group in the U.S. mining industry based on the number of mining operations. Sand and gravel mines comprise 57 percent of all M/NM mines, and account for 25 percent of all M/NM employment. Using MSHA's definition of a small mine, 95 percent of sand and gravel mines are small and account for 75 percent of employment in sand and gravel mines. Using SBA's definition, 100 percent of sand and gravel mines are small and have 45,453 employees.[17]

Other Nonmetal Mining

For enforcement and statistical purposes, MSHA separates stone and sand and gravel mining from other nonmetal mining. There are approximately 35 nonmetal commodities, not including stone, and sand and gravel. These nonmetal operations use a wide variety of underground mining methods such as continuous mining (similar to coal mining), in-situ retorting, block caving, and room and pillar. The mining method depends on the geologic characteristics of the ore and host rock. Some nonmetal operations use kilns and dryers in ore processing. Surface nonmetal mining operations use drilling, blasting, evaporation, dredging, and other methods, depending on the ore formation, to extract minerals.

These other nonmetal mines comprise 6 percent of all M/NM mines and account for 13 percent of all M/NM employment. Using MSHA's definition of a small mine, 70 percent of other nonmetal mines are small and account for 14 percent of employment in other nonmetal mines. Using SBA's definition, 99.7 percent of other nonmetal mines are small and account for 93 percent of employment in other nonmetal mines.[18]

ECONOMIC CHARACTERISTICS OF THE METAL/NONMETAL MINING INDUSTRY

The value of all M/NM mining output in 2005 was estimated at $51.5 billion. Metal mines, which include copper, gold, iron, lead, silver, tin, and zinc mines, contributed $16.3 billion.[19] Stone production was valued at $10.5 billion; sand and gravel production was valued at $7.9 billion.[20] The remaining nonmetal production, such as potash, clay, and salt, was valued at $16.8 billion.

The end uses of M/NM mining output are diverse. For example, iron and aluminum are used to produce vehicles and other heavy duty equipment, as well as consumer goods

[17] Ibid.

[18] Ibid.

[19] U.S. DOI, USGS, *Mineral Commodity Summaries 2006*, January 2006, p. 8.

[20] Ibid., pp.142, 144, 158, 160.

such as household equipment and soft drink cans. Other metals, such as uranium and titanium, have more limited uses. Nonmetals, like cement, are used in construction while salt is used as a food additive and for road de-icing in the winter. Soda ash, phosphate rock, and potash also have a wide variety of commercial uses. Stone and sand and gravel are used in numerous industries and extensively in the construction industry.

III. BENEFITS

The Mine Safety and Health Administration has qualitatively determined that the final rule will yield net health and safety benefits, relative to a continuation of the civil penalties in the existing rule. The final rule revises MSHA's civil penalty assessment procedures by eliminating single penalties, revises the calculation of points for regular assessments, and raises the penalties for most violations.

The benefits of the final rule are the reduced number of injuries, illnesses, and fatalities that will result from improved compliance with MSHA's health and safety standards and regulations in response to increased penalty assessments. MSHA projects that increased penalties will induce mine operators and independent contractors to reduce all safety and health violations. The reduction in all violations, and particularly S&S violations, or those reasonably likely to result in reasonably serious injury or illness, will reduce the number and severity of injuries and illnesses.

The likely reduction in violations and the benefits resulting from improved compliance have not been scientifically established to be at any particular level. Accordingly, MSHA has not provided a quantitative estimate of the reduction in injuries and fatalities due to the final rule.

IV. COST OF COMPLIANCE

SUMMARY

Before proceeding, it is important to note the nature of the impact associated with the final rule. For most MSHA rules, the estimated impact reflects the cost to the mining industry of achieving compliance with the rule. Also, the analysis of the costs or economic impact of a rule normally assumes that mine operators and independent contractors are in 100% compliance with a rule. Under the assumption that mine operators and independent contractors are in 100% compliance with all of MSHA's rules, there will be no cost of compliance with the final rule, since no mine operator or independent contractor who fully complies with the law will be liable for civil penalties. Because the assumption of 100% compliance would not lead to a realistic accounting of the impacts of this rulemaking, this usual method of analysis is not used in this REA to analyze the final rule.

For purposes of analyzing the economic effects of the final rule, MSHA instead focuses on the likely change in costs to mine operators and independent contractors, where compliance with all of MSHA's rules is no longer assumed. In other words, this analysis assumes, in the baseline against which the impacts of the rulemaking will be compared, a certain amount of non-compliance with current MSHA standards and regulations. For an increase in civil penalties, the costs are of two types. The first type is the increased payment of civil penalties for those infractions that continue to be incurred by mine operators and independent contractors. The second type is the increased cost to the mine operator or independent contractor of complying with rules that the mine operator or independent contractor would otherwise not comply with. A third cost impact, not due to an increase in civil penalties, is from a new requirement in the final rule to request a safety and health conference in writing and to include a brief statement of the reason why each citation or order should be conferenced. The analysis of this third impact does assume 100% compliance with the new provision.

The first cost impact of the final rule is the increased yearly civil payments for penalties received. This impact is not a traditional compliance cost, but rather a cost specifically due to non-compliance with MSHA standards and regulations.[21] Table IV-1 summarizes these yearly costs for the industry. Table IV-2 summarizes these yearly costs on a per-mine and per-contractor basis.

[21] Since the baseline of this analysis assumes a certain amount of non-compliance, some firms are currently enjoying cost savings associated with non-compliance with MSHA's current standards and regulations. These cost savings are not explicitly analyzed in this rulemaking because they are part of the baseline.

Table IV-1. Summary of Increase in Yearly Civil Penalties Due to Final Rule, Total Costs for Industry

Employment Size	Mine		Contractor		Total Penalty Increase
	Coal	M/NM	Coal	M/NM	
1-5	$151,202	$548,776	$89,745	$120,028	$909,751
6-19	$826,877	$872,186	$51,513	$53,686	$1,804,263
20-500	$14,150,768	$2,223,340	$234,290	$176,229	$16,784,627
501+	$2,019,684	$510,385	$7,302	$25,720	$2,563,091
All Sizes	$17,148,530	$4,154,688	$382,850	$375,663	$22,061,731

Table IV-2. Summary of Increase in Yearly Civil Penalties Due to Final Rule, Average Cost Per Mine or Per Independent Contractor

Employment Size	Mine		Contractor		Average Penalty Increase Per Entity
	Coal	M/NM	Coal	M/NM	
1-5	$269	$85	$64	$48	$83
6-19	$1,418	$200	$78	$44	$265
20-500	$15,636	$1,263	$542	$304	$4,565
501+	$144,263	$24,304	$2,434	$4,287	$58,252
All Sizes	$8,304	$330	$153	$87	$1,028

The second cost impact of the final rule is the expenses incurred to increase compliance with MSHA standards and regulations so as to reduce the number and amount of civil penalties otherwise received. These are compliance costs, but for existing MSHA standards and regulations. Although these costs were included in economic assumptions made when those standards and regulations were promulgated, and at that time MSHA generally assumed full industry compliance, the baseline for this analysis assumes that some firms have actually not incurred these costs. Therefore, compliance efforts made in response to increased penalties are a cost attributable to the final rule for the purposes of this impact analysis. Tables IV-3 and IV-4 summarize the additional yearly expenditures associated with improved compliance.

Table IV-3. Summary of Additional Yearly Expenditures to Improve Compliance Due to Final Rule, Total Costs for Industry

Employment Size	Mine		Contractor		Total Additional Expenditure
	Coal	M/NM	Coal	M/NM	
1-5	$64,801	$235,190	$38,462	$51,441	$389,893
6-19	$354,376	$373,794	$22,077	$23,008	$773,255
20-500	$6,064,615	$952,860	$100,410	$75,527	$7,193,412
501+	$865,579	$218,736	$3,130	$11,023	$1,098,468
All Sizes	$7,349,370	$1,780,580	$164,078	$160,999	$9,455,028

Table IV-4. Summary of Additional Yearly Expenditures to Improve Compliance Due to Final Rule, Average Cost Per Mine or Per Independent Contractor

Employment Size	Mine		Contractor		Average Expenditure Per Entity
	Coal	M/NM	Coal	M/NM	
1-5	$115	$36	$27	$21	$36
6-19	$608	$86	$33	$19	$113
20-500	$6,701	$541	$232	$130	$1,956
501+	$61,827	$10,416	$1,043	$1,837	$24,965
All Sizes	$3,559	$141	$66	$37	$440

The third cost impact of the final rule is the increase in cost for requesting a safety and health conference to review an MSHA citation. This cost increase results from a new requirement in 30 CFR § 100.6(b) stating that the request for a safety and health conference must be in writing and must include a brief statement of the reason why each citation or order should be conferenced. The analysis of conference costs assumes 100% compliance with this new provision. Tables IV-5 and IV-6 summarize these increased yearly conference costs.

Table IV-5. Summary of Additional Yearly Conference Costs Due to Final Rule, Total Costs for Industry

Employment Size	Mine		Contractor		Total Conference Costs
	Coal	M/NM	Coal	M/NM	
1-5	$2,032	$9,185	$2,111	$1,177	$14,505
6-19	$6,719	$11,823	$564	$770	$19,875
20-500	$32,194	$12,966	$1,087	$869	$47,116
501+	$3,285	$1,226	$13	$48	$4,573
All Sizes	$44,230	$35,200	$3,776	$2,864	$86,069

Table IV-6. Summary of Additional Yearly Conference Costs Due to Final Rule, Average Cost Per Mine or Per Independent Contractor

Employment Size	Mine		Contractor		Average Conference Cost Per Entity
	Coal	M/NM	Coal	M/NM	
1-5	$4	$1	$2	$0	$1
6-19	$12	$3	$1	$1	$3
20-500	$36	$7	$3	$1	$13
501+	$235	$58	$4	$8	$104
All Sizes	$21	$3	$2	$1	$4

These cost estimates and the methodology for deriving these estimates are described in more detail below.

METHODOLOGY

MSHA analyzes two possible effects on mine operations from the adjustment of penalties. When penalties go up, mine operators and independent contractors must pay more for violations. This first effect increases the collection of assessments by MSHA. The penalty increase also induces mine operators and independent contractors to reduce the number of violations. This second effect increases the resources mine operators and independent contractors devote to preventing health and safety violations.

The increase or decrease in MSHA assessments is a transfer of resources between government and private industry. It is not a cost or cost saving to society as a whole, although it is a private cost or cost saving to mine operators and independent contractors. On the other hand, resources used (or not used) to prevent health and safety violations are a cost (or cost saving) to society. The sum of assessments and resource costs equals total costs to mine operators and independent contractors.

MSHA believes that the response of health and safety violations to a change in penalty size is probably inelastic. That is, a 1% increase in penalty amount probably leads to less than a 1% reduction in violations. MSHA has performed no studies to estimate the size of this effect.

Several considerations bear on the likely size of the elasticity number. The amount of resources a mine operator or independent contractor devotes to compliance with standards and regulations depends, in part, on the relationship between the penalty size and the cost of compliance. If the cost of compliance is small relative to the penalty size, mine operators and independent contractors are likely to comply rather than incur penalties.

On the other hand, if the cost of compliance is high relative to the penalty size, penalty size alone is unlikely to ensure compliance by all mine operators and independent contractors. In the appropriate circumstances, MSHA has authority to close down mines (in whole or in part) until such time as the mine comes into compliance. (See §§ 103(k), 104(d),

and 107(a) of the Federal Mine Safety and Health Act of 1977.[22]) The cost of mine closure is generally rather high relative to the cost of compliance. Most mines choose to comply within hours or days of a closure order. Only very rarely does a mine operator choose to remain shut down by an MSHA closure order, rather than incur the expense of compliance.

Accordingly, the types of violations most likely to be affected by penalty size are those infractions where the cost of compliance is modest relative to penalty size. In the absence of other incentives for compliance, a neutral assumption is that there would be a unitary elasticity for the response of health and safety violations to a change in penalty size.

However, other incentives for compliance do exist. In particular, workers are concerned about the health and safety of their mine environment. Depending on the nature, frequency, and extent of violations found by MSHA inspectors, workers may become harder to recruit or retain. Other things equal, a mine operator would prefer not to develop a reputation for operating an unsafe or unhealthy mine. Additionally, even when not discovered by MSHA inspectors, health and safety violations increase the likelihood of accident, with possible loss of mine equipment and property and possible miner injury. These factors tend to reduce productivity and increase material and labor costs independently of the size of penalties.

Knowledge of these additional incentives supports a belief that the response of health and safety violations to a change in penalty size is probably inelastic. MSHA has performed no studies to estimate the size of this effect. Strictly for purposes of providing an example of possible effects, MSHA assumes an elasticity number of -0.3 for the response of violations to penalty size.

The additional expenditures to improve compliance are resource costs that arise because penalty increases induce mine operators and independent contractors to devote more resources to avoiding health and safety violations that may result in civil penalties. These resource costs are computed as the integral of a constant-elasticity curve over the penalty-prices associated with the expected quantity changes.[23]

As indicated above, the calculations using an elasticity number of -0.3 are included for purposes of illustration only. Use of a less elastic number (say -0.1) would yield larger changes in assessments and smaller changes in resource costs. Use of a more elastic number (say -0.7) would yield smaller changes in assessments and larger changes in resource costs.

SCOPE

The final rule applies to all mines subject to MSHA's jurisdiction. The new civil penalties apply only to mines that fail to comply with the Mine Act and MSHA standards and regulations.

[22] Public Law 91-173, as amended by Public Laws 95-164 and 109-236.

[23] The constant-elasticity curve has formula $P = AQ^{(1/\varepsilon)}$, where P = Penalty Amount, Q = Quantity (or Number) of Violations, ε = Elasticity, and A is an arbitrary parameter. The integral of PdQ is $PQ/(1+1/\varepsilon)$.

ANALYSIS OF IMPACT OF INCREASED CIVIL PENALTY ASSESSMENTS

In order to derive and explain the cost impact of the final rule on the mining industry, MSHA has divided its analysis into three sections: (1) the baseline--the total number and monetary amount of civil penalty assessments proposed by MSHA in 2005; (2) the impact of the final rule on civil penalty assessments under the assumption that mine operators and independent contractors take no actions, in response to increased proposed penalty assessments, to increase compliance with MSHA standards and regulations; and (3) the impact of the final rule on the number and amount of civil penalty assessments taking into account the anticipated response of mine operators and independent contractors to increase compliance with MSHA standards and regulations and thereby reduce the number of civil penalty assessments they would otherwise receive.

Baseline

The first step in estimating the impact of the final rule is to establish a baseline: the number and monetary amount of civil penalty assessments in the absence of the final rule. For this purpose, MSHA chose all civil penalty assessments for 2005, the last full calendar year of data prior to the final rule. Table IV-7 shows the number of violations that received civil penalty assessments in 2005, disaggregated by employment size, by coal and metal and nonmetal (M/NM), and by mines and independent contractors.[24]

Table IV-7. Baseline Number of Civil Penalties Assessed - 2005

Employment Size	Mine		Contractor		Total Violations Assessed
	Coal	M/NM	Coal	M/NM	
1-5	2,741	12,528	2,848	1,605	19,722
6-19	9,063	16,125	761	1,050	26,999
20-500	43,428	17,685	1,466	1,185	63,764
501+	4,432	1,672	18	66	6,188
All Sizes	59,664	48,010	5,093	3,906	116,673

The mine size and contractor size categories being used are 1-5 employees, 6-19 employees, 20-500 employees, and more than 500 employees. These categories are relevant for the analysis of impact in Chapter V of this REA, to determine whether small mines, as defined by the Small Business Administration (SBA) and MSHA, will be significantly impacted by the final rule.

Violation data have been broken out by coal and M/NM and by mine operator and independent contractor. Employment size is shown by mine operator and independent contractor.

Of the 116,673 civil penalty assessments issued in 2005, 113,484, or approximately 97.3%, were single penalty or regular assessments. The remaining 3,189, or 2.7%, were special assessments.

[24] The total number of violations for 2005 is the same as was presented in the analysis in support of the proposed rule. However, a few dozen independent contractor violations were misclassified by employment size in that analysis. These have been corrected in MSHA's analysis of the final rule.

As can be calculated from Table IV-7, there were approximately 25% more coal violations than M/NM violations in 2005, even though there were more than 3 ½ times as many M/NM mines and independent contractors as there were coal mines and independent contractors. One reason for the larger number of coal violations is that there are approximately 3 times as many underground coal mines as underground M/NM mines. There are a number of circumstances surrounding underground mines which tend to result in a greater number of violations. They are required to be inspected more often, and conditions are generally more dangerous and subject to change. Another reason for more coal violations is that coal mines are, on average, larger operations than M/NM mines, and larger mines tend to receive more violations, on average, than smaller mines. The average coal mine employed approximately 3 times as many miners as the average M/NM mine in 2005.

The monetary amount used for each 2005 civil penalty assessment in the baseline was the penalty proposed by MSHA. Table IV-8 shows, by employment size, the total baseline dollar amount of civil penalties proposed by MSHA in 2005 for coal-M/NM, mine operators and independent contractors.[25]

Table IV-8. Baseline Total of Proposed Civil Penalty Assessments for 2005

	Mine		Contractor		Total Assessed
Employment Size	Coal	M/NM	Coal	M/NM	Penalties
1-5	$463,277	$1,887,443	$303,374	$196,722	$2,850,816
6-19	$1,492,545	$2,535,563	$88,219	$112,762	$4,229,089
20-500	$11,010,009	$3,890,799	$313,795	$193,451	$15,408,054
501+	$1,706,750	$634,888	$5,775	$14,876	$2,362,289
All Sizes	$14,672,581	$8,948,693	$711,163	$517,811	$24,850,248

Table IV-8 reveals that total civil penalty assessments in 2005 were substantially larger, more than 50% larger, for coal mines than for M/NM mines. The larger aggregate penalty assessment for coal mines is due to the larger number of violations issued to coal mines and the higher average penalty per violation. Coal violations tend to be more serious, on average, than M/NM violations (e.g., 40% of coal violations are Significant and Substantial, or S&S, versus 23% for M/NM violations).

Of the $24.9 million in civil penalties proposed by MSHA in 2005, $16.6 million, or approximately 67%, were from single penalty and regular assessments. The remaining $8.2 million were from special assessments. Of this special assessment amount, approximately $0.3 million were issued to agents of mine operators and another $1.5 million were issued for violations involving a fatality.

Table IV-9 displays the baseline average dollar amount of a proposed civil penalty in 2005 disaggregated by employment size and coal-M/NM, mine-independent contractor. The average penalty assessment for a violation in 2005 was $213. For a single penalty assessment, the penalty was $60. For a regular penalty assessment, the average penalty was

[25] As previously noted, a few dozen independent contractor violations were misclassified by employment size in the analysis in support of the proposed rule. These have been corrected in MSHA's analysis of the final rule.

$316. For a special assessment, the average penalty was $2,574. For special assessments issued to agents of the mine operator, the average assessment was $582; for special assessments involving a fatality, the average penalty was $27,181; and for all other special assessments, the average penalty was $2,385.

Table IV-9. Baseline Average Proposed Civil Penalty Assessment per Violation in 2005

Employment Size	Mine		Contractor		Average of All Violations
	Coal	M/NM	Coal	M/NM	
1-5	$169	$151	$107	$123	$145
6-19	$165	$157	$116	$107	$157
20-500	$254	$220	$214	$163	$242
501+	$385	$380	$321	$225	$382
All Sizes	$246	$186	$140	$133	$213

Table IV-9 shows that the average proposed penalty assessment in 2005 generally tended to increase as mine size increased. Table IV-9 also indicates that the difference in average penalties between coal and M/NM mines of a given employment size and between coal and M/NM independent contractors of a given employment size is generally small.

Impact If No Compliance Response to Increased Penalties

With the baseline established, the next task in the cost analysis is to determine the impact of the final rule on civil penalty assessments under the assumption that mine operators and independent contractors take no actions, in response to increased proposed penalty assessments, to increase compliance with MSHA standards and regulations. This task is an intermediate step in determining the total cost impact of the final rule, as MSHA's assumption in the next section is that mine operators and independent contractors will change their compliance behavior in response to increased penalties.

Assuming no compliance response by mine operators and independent contractors, the number of violations would not change under the final rule. (See Table IV-7 for the baseline number.) However, the type of assessments for many of the violations will change under the final rule. In the analysis, all 2005 regular and single penalty assessments will be issued as regular assessments under the final rule. MSHA assumed that most unwarrantable failure violations would be processed as regular assessments, but would receive at least the minimum penalty amounts required in the MINER Act. MSHA also assumed that violations issued to agents, those involving a fatality and processed as a special assessment in 2005, those involving failure to promptly notify MSHA, and those determined to be flagrant will be processed as special assessments under the final rule. For purposes of this analysis, MSHA further assumed that all other 2005 special assessments will be processed as regular assessments. Thus, under the final rule, MSHA estimates that the number of special assessments will decline by 85%, from 3,189 to 491. MSHA anticipates that, under the final rule, the regular assessment provision will generally provide an appropriate penalty for most violations previously processed as special assessments. Equally significant, this will allow

MSHA to focus its enforcement resources on more field enforcement activities, as opposed to administrative review activities.

Tables IV-10 and IV-11 show the estimated total dollar amount and average dollar amount, respectively, of civil penalties under the final rule, assuming no compliance response by mine operators and independent contractors.[26] Table IV-12 shows, relative to the baseline, the estimated percentage increase of civil penalties (both total and average) under the final rule, assuming no compliance response by mine operators and independent contractors. All of these tables are disaggregated by employment size, coal-M/NM, and mine/contractor.

Table IV-10. Total Proposed Civil Penalty Assessments Yearly Under Final Rule, Assuming No Compliance Response

	Mine		Contractor		Total Assessed
Employment Size	Coal	M/NM	Coal	M/NM	Penalties
1-5	$767,042	$3,012,830	$481,319	$411,043	$4,672,234
6-19	$3,084,550	$4,351,900	$185,137	$216,073	$7,837,660
20-500	$39,453,598	$8,511,820	$813,547	$586,656	$49,365,621
501+	$5,720,223	$1,664,345	$19,356	$66,223	$7,470,147
All Sizes	$49,025,413	$17,540,895	$1,499,359	$1,279,995	$69,345,662

Table IV-11. Average Proposed Civil Penalty Assessment per Violation Under Final Rule, Assuming No Compliance Response

	Mine		Contractor		Average of
Employment Size	Coal	M/NM	Coal	M/NM	All Violations
1-5	$280	$240	$169	$256	$237
6-19	$340	$270	$243	$206	$290
20-500	$908	$481	$555	$495	$774
501+	$1,291	$995	$1,075	$1,003	$1,207
All Sizes	$822	$365	$294	$328	$594

[26] The analysis in support of the proposed rule had a minor error in the formula for calculating history for repeat violations of the same standard, the effect of which was to slightly underestimate the impact of the proposed rule. The analysis also improperly assigned history points to operators with fewer than 10 violations over the previous 15-month period, the effect of which was to slightly overestimate the impact of the proposed rule. These errors have been corrected in MSHA's analysis of the final rule. The corrected estimate of total civil penalties under the proposed rule, assuming no compliance response by industry, is $70.0 million (rather than $68.5 million in the proposal); the average civil penalty is $600 (rather than $587); and the percentage increase of civil penalties is 182% (rather than 176%).

Table IV-12. Percentage Increase in Total and Average Proposed Civil Penalty Assessments Under Final Rule, Assuming No Compliance Response

Employment Size	Mine		Contractor		Average Percentage Increase All Violations
	Coal	M/NM	Coal	M/NM	
1-5	66%	60%	59%	109%	64%
6-19	107%	72%	110%	92%	85%
20-500	258%	119%	159%	203%	220%
501+	235%	162%	235%	345%	216%
All Sizes	234%	96%	111%	147%	179%

As indicated in these tables, MSHA estimates that total yearly civil penalty assessments will increase under the final rule, assuming no compliance response, from $24.9 million to $69.3 million, an increase of $44.5 million, or 179%. Approximately $2.5 million, or 4%, will come from special assessments. Of the $44.5 million increase, approximately $1.9 million will result from the minimum penalty provisions for unwarrantable failure violations in the MINER Act. In its analysis of 2005 data, MSHA found one violation which met the failure to provide timely notification provision in the MINER Act. For this category of violations, the MINER Act imposes a penalty of $5,000 to $60,000. However, the particular violation had already received a special assessment in excess of $5,000. Thus, MSHA did not adjust penalty totals to account for this provision of the MINER Act.

MSHA has determined that flagrant violations will be processed under the special assessment provision. As stated in the preamble, MSHA will use the definition for flagrant violation in the MINER Act, but the Agency cannot estimate, at this point in the rulemaking process, the specific impact of this new requirement in the MINER Act. The Agency does, however, anticipate that penalties will increase due to this provision.

MSHA estimates that the average penalty assessment will increase under the final rule, assuming no compliance response, from $213 (shown in Table IV-9) to $594 (shown in Table IV-11), an increase of 179% (shown in Table IV-12). Consistent with Congressional intent, the average penalty generally increases as mine size or contractor size increases (shown in Table IV-11).

For purposes of the analysis, special assessments that would be processed as special assessments under the final rule were assumed to receive the same penalty, unless they would be impacted by the minimum penalty provisions of the MINER Act. The average penalty for special assessments issued to agents of the mine operator is estimated to increase by 367% under the final rule. All of this increase is due to the application of the minimum penalty provisions for unwarrantable failure violations in the MINER Act.

For purposes of analysis, MSHA assumes that all specially assessed violations, except those involving fatalities, agents, failure to timely notify MSHA, and flagrant violations, would be processed as regular assessments under the final rule. In the analysis, the average penalty increased by 98% for those 2005 special assessments that would be processed as regular assessments under the final rule.

Impact with Improved Compliance Response to Increased Penalties

MSHA intends and expects that increased penalty assessments will lead to efforts by mine operators and independent contractors to increase compliance with MSHA standards and regulations and ultimately to fewer violations and improved mine safety and health. MSHA assumes that each violation is associated with a probability of occurrence that declines as penalty assessments rise. To estimate this impact, MSHA assumes that, at the margin, each 10% increase in penalty for a violation is associated with a 3% decrease in its probability of occurrence.

In economic terms, this is equivalent to assuming an elasticity of -0.3 between the number of violations and the dollar size of penalties.[27] This elasticity of -0.3 was assumed by MSHA in its regulatory economic analysis for the 2003 direct final rule to adjust civil penalties for inflation.

MSHA has applied this assumption to each assessed violation in the 2005 database. For most violations, the final rule will result in a penalty increase. Accordingly, MSHA has computed a reduction (or in rare cases, an increase) in the probability of the violation's occurrence. The reduction is larger as the penalty increases.

Tables IV-13 and IV-14 estimate the improved compliance response of the industry to increased penalty assessments.[28] Table IV-13 provides estimates for mine operators and Table IV-14 provides estimates for independent contractors. Tables IV-13 and IV-14 show, by employment size, by coal-M/NM, and by operator/contractor, the number of violations and the dollar amount of penalties in the 2005 database under the existing rule. Further, using the assumption that the elasticity of response is -0.3 for each violation, Tables IV-13 and IV-14 estimate the new reduced number of violations and the increased penalties associated with these violations under the final rule.[29] Taking into account the mining industry's improved compliance response, MSHA estimates that, were the final rule in effect in 2005, total violations would have declined from 116,673 to 93,422, or a reduction of approximately 20%.

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[27] Using the constant elasticity formula, $P = AQ^{(1/\varepsilon)}$, where P = Penalty (Price of Violation), Q = Quantity or expected frequency of Violation, A is an arbitrary constant, and ε = elasticity = -0.3, it is possible to derive $(Q_2/Q_1) = (P_2/P_1)^{(-0.3)}$. Thus, for example, an increase in a penalty from $60 to $100 would be associated with a reduction in the frequency of that violation from 1.0 to 0.86. An increase in a penalty from $60 to $60,000 would be associated with a reduction in the frequency of that violation from 1.0 to 0.13.

[28] The analysis in support of the proposed rule had a minor error in the formula for calculating history for repeat violations of the same standard, the effect of which was to slightly underestimate the impact of the proposed rule. The analysis also improperly assigned history points to operators with fewer than 10 violations over the previous 15-month period, the effect of which was to slightly overestimate the impact of the proposed rule. These errors have been corrected in MSHA's analysis of the final rule. The corrected estimate of total civil penalties under the proposed rule, after improved compliance response by industry, is $46.3 million (rather than $45.8 million in the proposal); the additional expenditures to improve compliance are $9.2 million (rather than $9.0 million); and the percentage increase after improved compliance response, is 86% (rather than 84%).

[29] The new number of violations is computed from the formula $(Q_2/Q_1) = (P_2/P_1)^{(-0.3)}$. Thus, for example, an increase in a penalty from $100 to $300 would be associated with a reduction in the frequency of that violation from 1.0 to 0.72. The new frequency is computed for each violation and the results are summed to compute the "Final Rule Number of Violations." The "Final Rule Proposed Penalties" is the sum for all existing violations of the new penalty for each violation multiplied by the new frequency for each violation.

Table IV-13. Impact of Final Rule on Mine Operators
Given Improved Compliance Response to Increased Penalty Assessments

Impact on Coal Mine Operators						
Mine Employment Size	Existing Rule Number of Violations	Existing Rule Proposed Penalties	Final Rule Number of Violations	Final Rule Proposed Penalties	Increase in Penalties	Additional Expenditures to Improve Compliance
1-5	2,741	$463,277	2,443	$614,479	$151,202	$64,801
6-19	9,063	$1,492,545	7,773	$2,319,422	$826,877	$354,376
20-500	43,428	$11,010,009	31,949	$25,160,777	$14,150,768	$6,064,615
501+	4,432	$1,706,750	3,051	$3,726,434	$2,019,684	$865,579
All Sizes	59,664	$14,672,581	45,216	$31,821,111	$17,148,530	$7,349,370
Impact on Metal/Nonmetal Mine Operators						
Mine Employment Size	Existing Rule Number of Violations	Existing Rule Proposed Penalties	Final Rule Number of Violations	Final Rule Proposed Penalties	Increase in Penalties	Additional Expenditures to Improve Compliance
1-5	12,528	$1,887,443	11,148	$2,436,219	$548,776	$235,190
6-19	16,125	$2,535,563	14,103	$3,407,749	$872,186	$373,794
20-500	17,685	$3,890,799	14,082	$6,114,139	$2,223,340	$952,860
501+	1,672	$634,888	1,189	$1,145,273	$510,385	$218,736
All Sizes	48,010	$8,948,693	40,522	$13,103,381	$4,154,688	$1,780,580

Table IV-14. Impact of Final Rule on Independent Contractors
Given Improved Compliance Response to Increased Penalty Assessments

Impact on Coal Independent Contractors						
Contractor Employment Size	Existing Rule Number of Violations	Existing Rule Proposed Penalties	Final Rule Number of Violations	Final Rule Proposed Penalties	Increase in Penalties	Additional Expenditures to Improve Compliance
1-5	2,848	$303,374	2,560	$393,119	$89,745	$38,462
6-19	761	$88,219	650	$139,732	$51,513	$22,077
20-500	1,466	$313,795	1,209	$548,085	$234,290	$100,410
501+	18	$5,775	13	$13,077	$7,302	$3,130
All Sizes	5,093	$711,163	4,432	$1,094,013	$382,850	$164,078
Impact on Metal/Nonmetal Independent Contractors						
Contractor Employment Size	Existing Rule Number of Violations	Existing Rule Proposed Penalties	Final Rule Number of Violations	Final Rule Proposed Penalties	Increase in Penalties	Additional Expenditures to Improve Compliance
1-5	1,605	$196,722	1,370	$316,750	$120,028	$51,441
6-19	1,050	$112,762	892	$166,448	$53,686	$23,008
20-500	1,185	$193,451	943	$369,680	$176,229	$75,527
501+	66	$14,876	47	$40,596	$25,720	$11,023
All Sizes	3,906	$517,811	3,252	$893,474	$375,663	$160,999

The "Increase in Penalties" column represents the increase in penalties, relative to the baseline, for remaining violations.[30] The increase in proposed penalty assessments is approximately $17.1 million for coal mine operators, $0.4 million for coal independent contractors, $4.2 million for M/NM mine operators, and $0.4 million for M/NM independent contractors. The increase for all operators, $22.1 million, reflects the total increase in penalties for the final rule, taking into account mine operators' and independent contractors' improved compliance behavior.

To reduce the number of violations in response to the increased penalty assessments, MSHA assumes that mines will increase expenditures to improve compliance with MSHA safety and health standards. The column, "Additional Expenditures to Improve Compliance," represents MSHA's estimate of these expenditures.[31] These estimates are based on the same assumption that the elasticity of response is -0.3 and the additional assumption that the increased compliance activities will be undertaken by the mining industry to avoid increased penalties.

Table IV-15 summarizes the impact of the final rule by mining sector and indicates that the combined impact of additional expenditures to improve compliance and the increase in penalties, given improved compliance, is $31.5 million a year.

[30] The "Increase in Penalties" is the "Final Rule Proposed Penalties" minus the "Existing Rule Proposed Penalties."

[31] The "Additional Expenditures to Improve Compliance" are the resource costs mentioned in the Methodology section. These resource costs are computed as the integral of a constant-elasticity curve over the penalty-prices associated with the expected quantity changes. The "Additional Expenditures to Improve Compliance" equals "Increase in Penalties" multiplied by "factor", where "factor" equals (-1) / [(1/ε) + 1] and ε = elasticity = -0.3. When ε = -0.3, "factor" = 3/7 = 0.43.

Table IV-15. Total Impact of Final Rule, Both With No Compliance Response and With Improved Compliance Response to Increased Penalty Assessments

No Compliance Response - Same Number of Violations						
Mining Sector	Existing Rule Proposed Penalties	Final Rule Proposed Penalties, Same Compliance	Increase in Penalties, Same Compliance	Additional Expenditures to Improve Compliance (None)	Total Cost Increase, Same Compliance	% Increase in Total Cost, Same Compliance
Coal	$15,383,744	$50,524,772	$35,141,028	$0	$35,141,028	228%
Metal	$1,396,682	$3,527,234	$2,130,552	$0	$2,130,552	153%
Nonmetal	$594,888	$1,122,694	$527,806	$0	$527,806	89%
Sand & Gravel	$3,113,522	$5,206,593	$2,093,071	$0	$2,093,071	67%
Stone	$4,361,412	$8,964,369	$4,602,957	$0	$4,602,957	106%
Total	$24,850,248	$69,345,662	$44,495,414	$0	$44,495,414	179%

Improved Compliance Response - Reduced Number of Violations						
Mining Sector	Existing Rule Proposed Penalties	Final Rule Proposed Penalties, Improved Compliance	Increase in Penalties, Improved Compliance	Additional Expenditures to Improve Compliance	Total Cost Increase, Improved Compliance	% Increase in Total Cost, Improved Compliance
Coal	$15,383,744	$32,915,124	$17,531,380	$7,513,449	$25,044,829	163%
Metal	$1,396,682	$2,410,136	$1,013,454	$434,337	$1,447,791	104%
Nonmetal	$594,888	$873,542	$278,654	$119,423	$398,076	67%
Sand & Gravel	$3,113,522	$4,122,806	$1,009,284	$432,550	$1,441,835	46%
Stone	$4,361,412	$6,590,371	$2,228,959	$955,268	$3,184,227	73%
Total	$24,850,248	$46,911,979	$22,061,731	$9,455,028	$31,516,759	127%

ANALYSIS OF INCREASED COST OF SAFETY AND HEALTH CONFERENCES

Section 100.6 of 30 CFR allows all parties to request a safety and health conference with the district manager and designee. The final rule includes a new requirement in § 100.6(b) that the request for a safety and health conference be in writing and include a brief statement of the reason why each citation or order should be conferenced.

MSHA data indicate that 9,287 violations were conferenced in 2005—4,567 by coal operators and contractors, and 4,720 by M/NM operators and contractors.[32] For purposes of estimating costs, MSHA assumes that the annual number of safety and health conference requests will be the same after the final rule takes effect (the reduced number of violations due to increased penalties and improved compliance offset by the additional incentive, due to increased penalties, to request a safety and health conference). Table IV-16 shows the

[32] Typically, multiple violations are combined into a single safety and health conference request. In 2005, the 4,567 coal violations were reviewed in 1,585 safety and health conferences, and the 4,720 M/NM violations were reviewed in 1,123 safety and health conferences. In the text, the costs for a safety and health conference are estimated per citation or order, not per conference.

estimated number of written requests for a safety and health conference to review a citation, disaggregated by employment size, coal-M/NM, and mine/contractor.

Table IV-16: Number of Violations for Which a Safety and Health Conference Is Requested*

Employment Size	Mine		Contractor		Total Number
	Coal	M/NM	Coal	M/NM	
1-5	193	1,139	201	146	1,679
6-19	639	1,466	54	95	2,254
20-500	3,063	1,608	103	108	4,882
501+	313	152	1	6	472
All Sizes	4,209	4,365	359	355	9,288

* Estimates of the total number of violations for which a conference is requested are based on MSHA conference and violation data for 2005.

MSHA estimates that it would take approximately 9 minutes per violation for a mine supervisor to prepare a written request for a safety and health conference. Because each request for a safety and health conference bundles together an average of between 3 and 4 violations, the 9 minutes per violation is equivalent to between 27 and 36 minutes to prepare a written request for each safety and health conference. The hourly wage rate for a coal supervisor is $63.39; the hourly wage rate for a M/NM supervisor is $47.10.[33] MSHA estimates that it will cost, on average, approximately $1 to submit each written request (by mail, fax, or email). Based on this information, each written request for a safety and health conference to review a citation would cost approximately $10.51 for a coal operator or contractor and $8.06 for a M/NM operator or contractor. Table IV-17 provides MSHA's estimate of the annual costs for coal and M/NM mines and contractors to make written requests for safety and health conferences.

[33] Data from pp. 6, B3 of *U.S. Coal Mines Salaries, Wages, and Benefits - 2005 Survey Results*, Western Mine Engineering Inc.; pp. 8, B2 of *U.S. Metal and Industrial Mineral Mine Salaries, Wages, and Benefits - 2005 Survey Results*, Western Mine Engineering Inc.; and MSHA calculations.

Table IV-17: Total Annual Costs to Make Written Requests for a Safety and Health Conference*

Employment Size	Mine		Contractor		Total Cost
	Coal	M/NM	Coal	M/NM	
1-5	$2,032	$9,185	$2,111	$1,177	$14,505
6-19	$6,719	$11,823	$564	$770	$19,875
20-500	$32,194	$12,966	$1,087	$869	$47,116
501+	$3,285	$1,226	$13	$48	$4,573
All Sizes	$44,230	$35,200	$3,776	$2,864	$86,069

* (Total cost for written request) = (total # of violations reviewed in conference) x [(# of hours per violation needed to make a written request for a conference) x (hourly wage rate for a supervisor) + (submission cost for a request)].

FEASIBILITY

MSHA has concluded that the requirements of the final rule are technologically and economically feasible.

Technological Feasibility

The final rule is a regulation, not a standard. It does not involve activities on the frontiers of scientific knowledge. The mining industry has been complying with the adjudication and payment of civil penalties for decades. MSHA concludes, therefore, that the final rule is technologically feasible.

Economic Feasibility

MSHA estimates that the yearly increased compliance costs and penalty assessments issued to coal mines as a result of the final rule will be $25.1 million dollars, which is equal to approximately 0.09 percent of coal mine sector revenues of $26.7 billion in 2005. MSHA estimates that the yearly increased compliance costs and penalty assessments issued to M/NM mines as a result of the final rule will be $6.5 million dollars, which is equal to approximately 0.01 percent of M/NM mine sector revenues of $51.5 billion in 2005. Penalty assessment estimates for both coal and M/NM include MSHA's assumption that mine operators and independent contractors will change their behavior and improve compliance as a result of increased penalties, and thereby receive fewer violations. Since the total estimated increased compliance costs and penalty assessments for both the coal and M/NM mine operators and independent contractors are well below one percent of their estimated revenues, MSHA concludes that the final rule is economically feasible for the mining industry.

V. REGULATORY FLEXIBILITY CERTIFICATION AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

INTRODUCTION

Pursuant to the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), MSHA has analyzed the impact of the final rule on small entities. Based on that analysis, MSHA certifies that the final rule will not have a significant economic impact on a substantial number of small entities. The factual basis for this certification is presented below.

DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a final rule on small entities, MSHA must use the Small Business Administration's (SBA) definition for a small entity, or after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the Federal Register for notice and comment. MSHA has not established an alternate definition, and hence is required to use the SBA definition. The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees (13 CFR 121.201).

MSHA has also examined the impact of agency rules on mines with fewer than 20 employees, which MSHA and the mining community have traditionally referred to as "small mines." These small mines differ from larger mines not only in the number of employees, but also in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, their costs of complying with MSHA's rules and the impact of the agency's rules on them will also tend to be different. It is for this reason that "small mines," traditionally defined by MSHA as those employing fewer than 20 workers, are of special concern to MSHA. In addition, for this final rule, MSHA has examined the cost on mines with five or fewer employees to ensure that this subset of mines is not significantly and adversely impacted by the final rule.

This analysis complies with the legal requirements of the RFA for an analysis of the impact on "small entities" while continuing MSHA's traditional definition of "small mines." Both the final rule and this analysis also reflect MSHA's concern for mines with five or fewer employees. MSHA concludes that it can certify that the final rule will not have a significant economic impact on a substantial number of small entities. MSHA has determined that this is the case for mines with fewer than 20 employees and mines with 500 or fewer employees. In its detailed factual basis below, MSHA will also show the impact of the final rule on mines with five or fewer employees.

FACTUAL BASIS FOR CERTIFICATION

General Approach

Our analysis of the economic impact on "small entities" begins with a "screening" analysis. The screening compares the estimated costs of a rule for small entities to the estimated revenues. When estimated costs are less than one percent of estimated revenues

(for the size categories considered), MSHA believes it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. If estimated costs are equal to or exceed one percent of revenues, it tends to indicate that further analysis may be warranted.

Derivation of Costs and Revenues

Normally, the analysis of the costs or economic impact of a rule assumes that mine operators and independent contractors are in 100% compliance with a rule. Under the assumption that mine operators and independent contractors are in 100% compliance with all of MSHA's rules, there would be no cost of compliance with the final rule, since no mine operator or independent contractor would be liable for civil penalties. For purposes of analyzing the effects on small mines, MSHA alters this usual assumption and instead analyzes the increased compliance costs and increased penalty assessments for mines that would not otherwise be in compliance with the agency's safety and health standards and regulations.

Total underground and surface coal production was 368 million tons and 765 million tons, respectively. The 2005 price of underground and surface coal was $36.42 and $17.37 per ton, respectively.[34] Thus, total estimated coal revenue in 2005 was $26.7 billion ($13.4 billion for underground and $13.3 billion for surface production). Using the same approach, the estimated 2005 coal revenue by employment size category is estimated to be approximately $75 million for mines with 1-5 employees, $657 million for mines with 1-19 employees, and $20.5 billion for mines with 1-500 employees.

For M/NM mines, the total 2005 estimated revenue generated by the M/NM industry ($51.5 billion)[35] was divided by the total number of employee hours to arrive at the average revenue per hour of employee production ($165.19). The $165.19 was multiplied by employee hours in specific mine size categories to arrive at estimated revenues for these categories. This approach was used to determine the estimated revenues for the M/NM mining industry because MSHA does not collect data on M/NM production. The 2005 M/NM revenues are estimated to be approximately $3.4 billion for mines with 1-5 employees, $15.6 billion for mines with 1-19 employees, and $46.5 billion for mines with 1-500 employees.

Results of Screening Analysis

Table V-1 below shows that when dividing the increase in penalties and compliance costs by the revenues in each mine size category, the cost of the rule for coal mines is 0.46% of revenues for mines with 1-5 employees, 0.25% of revenues for mines with 1-19 employees, and 0.11% of revenues for mines with 1-500 employees. Table V-1 also shows the penalty and cost increase as a percentage of revenues for all coal mines to be 0.09%.

Table V-1 also shows that when dividing the increase in penalties and compliance costs by the revenues in each mine size category, the cost of the rule for M/NM mines is

[34] The average price for underground and surface coal of $36.42 and $17.37 per ton, respectively, comes from the U.S. DOE, EIA, "Annual Coal Report 2005," Table 28, October 2006.

[35] U.S. DOI, USGS, Mineral Commodity Summaries 2006, January 2006, p. 8.

0.03% of revenues for mines with 1-5 employees, 0.01% of revenues for mines with 1-19 employees, and 0.01% of revenues for mines with 1-500 employees. Table V-1 also shows the penalty and cost increase as a percentage of revenues for all M/NM mines to be 0.01%.

For coal mines, Table V-1 further shows that the final rule will result in an increase in costs and penalties per mine of: $619 for mines with 1-5 employees; $1,405 for mines with 1-19 employees; and $10,821 for mines with 500 or fewer employees. For M/NM mines, Table V-1 shows that the final rule will result in an increase in costs and penalties per mine of: $149 for mines with 1-5 employees; $213 for mines with 1-19 employees; and $457 for mines with 500 or fewer employees.

Table V-1. Increase in Costs and Penalties Due to Final Rule Compared to Mine Revenues, by Mine Size

Employment Size	Number of Mines	Increase in Penalties and Compliance Costs	Estimated Revenue (Millions)	Increase in Costs and Penalties Per Mine	Penalty and Cost Increases as % of Revenue
Coal Mines					
1-5 employees	563	$348,353	$75	$619	0.46%
1-19 employees	1,146	$1,610,478	$657	$1,405	0.25%
1-500 employees	2,051	$22,193,841	$20,492	$10,821	0.11%
All sizes	2,065	$25,092,834	$26,709	$12,151	0.09%
M/NM Mines					
1-5 employees	6,469	$965,796	$3,384	$149	0.03%
1-19 employees	10,820	$2,301,064	$15,607	$213	0.01%
1-500 employees	12,580	$5,742,855	$46,480	$457	0.01%
All sizes	12,601	$6,509,994	$51,500	$517	0.01%

As shown in Table V-1, when applying MSHA's and SBA's definitions of small mines, yearly costs of the final rule are substantially less than one percent of estimated yearly revenues, well below the level suggesting that the rule might have a significant economic impact on a substantial number of small entities. Accordingly, MSHA has certified that the final rule will not have a significant economic impact on a substantial number of small entities that are covered by the rule.

VI. OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT OF 1995

The final rule does not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments; nor does it increase private sector expenditures by more than $100 million annually; nor does it significantly or uniquely affect small governments. Accordingly, the Unfunded Mandates Reform Act of 1995 (2 U.S.C. § 1501 et seq.) requires no further agency action or analysis.

TREASURY AND GENERAL GOVERNMENT APPROPRIATIONS ACT OF 1999: ASSESSMENT OF FEDERAL REGULATIONS AND POLICIES ON FAMILIES

The final rule will have no effect on family well-being or stability, marital commitment, parental rights or authority, or income or poverty of families and children. Accordingly, § 654 of the Treasury and General Government Appropriations Act of 1999 (5 U.S.C. § 601 note) requires no further agency action, analysis, or assessment.

EXECUTIVE ORDER 12630: GOVERNMENT ACTIONS AND INTERFERENCE WITH CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS

The final rule will not implement a policy with takings implications. Accordingly, Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, requires no further agency action or analysis.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

The final rule was drafted and reviewed in accordance with Executive Order 12988, Civil Justice Reform. The final rule was written to provide a clear legal standard for affected conduct and was carefully reviewed to eliminate drafting errors and ambiguities, so as to minimize litigation and undue burden on the Federal court system. MSHA has determined that the final rule meets the applicable standards provided in § 3 of Executive Order 12988.

EXECUTIVE ORDER 13045: PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

The final rule will have no adverse impact on children. Accordingly, Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, as amended by Executive Orders 13229 and 13296, requires no further agency action or analysis.

EXECUTIVE ORDER 13132: FEDERALISM

The final rule does not have "federalism implications" because it does not "have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels

of government." Accordingly, Executive Order 13132, Federalism, requires no further agency action or analysis.

EXECUTIVE ORDER 13175: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

The final rule does not have "tribal implications" because it does not "have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes." Accordingly, Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, requires no further agency action or analysis.

EXECUTIVE ORDER 13211: ACTIONS CONCERNING REGULATIONS THAT SIGNIFICANTLY AFFECT ENERGY SUPPLY, DISTRIBUTION, OR USE

The final rule has been reviewed for its impact on the supply, distribution, and use of energy because it applies to the coal mining industry. Insofar as the final rule will result in added yearly compliance costs and civil penalty assessments of approximately $25.1 million to the coal mining industry, relative to annual revenues of $26.7 billion in 2005, it is not a "significant energy action" because it is not "likely to have a significant adverse effect on the supply, distribution, or use of energy * * * (including a shortfall in supply, price increases, and increased use of foreign supplies)." Accordingly, E.O. 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, requires no further Agency action or analysis.

EXECUTIVE ORDER 13272: PROPER CONSIDERATION OF SMALL ENTITIES IN AGENCY RULEMAKING

MSHA has thoroughly reviewed the final rule to assess and take appropriate account of its potential impact on small businesses, small governmental jurisdictions, and small organizations. MSHA has determined and certified that the final rule will not have a significant economic impact on a substantial number of small entities.

VII. PAPERWORK REDUCTION ACT OF 1995

This final rule contains no information collection requirements subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act (PRA).

Revised paragraph (b) in § 100.6 requires that a request for a safety and health conference be in writing and include a brief statement of the reason that each citation or order should be conferenced. MSHA views this new provision as an administrative action that is not subject to the PRA because collections of information that involve "an administrative action or investigation involving an agency against specific individuals or entities" are exempted from the requirements of the Paperwork Reduction Act. 44 U.S.C. § 3518(c)(1)(B)(ii).

VIII. REFERENCES

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