The Economic Contributions of U.S. Mining (2015 Update)

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National Mining Association

NMA
National Mining Association

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EXECUTIVE SUMMARY

More than 13,000 operations mine for coal, metal ores and non-metallic minerals in the United States, according to the Mine Safety and Health Administration. These mines provide the energy resources and raw materials that are essential to a growing economy.

National Results

U.S. mining directly and indirectly generated nearly 1.7 million full-time and part-time jobs in 2015, including employees and the self-employed.

- U.S. mines accounted for more than 565,000 jobs.
- Jobs in other industries attributable to or induced by U.S. mining totaled more than 1.1 million.

U.S. labor income associated with U.S. mining exceeded $100 billion in 2015, which includes wages and salaries, other employee benefits and owner-operator business (proprietors') income.

Table E-1. Economic Contribution of U.S. Mining, 2015

Item	Direct	Indirect and Induced	Total
Employment	565,548	1,122,816	1,688,364
Labor Income (billions of dollars)	$39.8	$63.9	$103.7
Contribution to GDP (billions of dollars)	$100.4	$120.0	$220.4
Taxes Paid (billions of dollars)	$18.0	$26.0	$44.0

Source: Calculations based on Mine Safety & Health Administration 2015 fourth quarter employment and the IMPLAN modeling system

Contribution by Mining Segment

The direct contributions or value added by each of the three mining sectors identified in this report include the operations of the mine, support activities and transportation of output from the mine.

The coal sector of U.S. mining accounted for 535,372 total jobs, $37.2 billion in total labor income and $65.6 billion in total contribution to GDP (see Table 1). Annual wages and salaries in coal mining operations (excluding support activities and transportation) averaged approximately $83,600 in 2015.[1] Overall, the total jobs attributed to coal mining were responsible for approximately 32 percent of U.S. mining's total employment contribution, 36 percent of total labor income and 30 percent of mining's total contribution to GDP.[2]

The metal ore mining segment of U.S. mining accounted for 319,797 jobs, $19.1 billion in labor compensation and $54.5 billion of GDP. Annual wages and salaries in the metal ore mining sector averaged $88,800. Metal ore mining accounted for 19 percent of total mining employment, 18 percent of labor income and 25 percent of mining's contribution to GDP.

The non-metallic mineral mining segment of U.S. mining accounted for 833,196 jobs, $47.4 billion in labor compensation and $100.3 billion of U.S. GDP. Annual wages and salaries in the non-metallic mining sector averaged $61,800. Non-metallic mineral mining represented 49 percent of mining employment, 46 percent of labor income and 45 percent of its contribution to GDP.[3]

Table 1. Economic Contribution of U.S. Mining Operations by Segment

Sector	Coal Mining	Metal Ore Mining	Non-metallic Mineral Mining	Total
Employment				
Direct	146,820	92,109	326,619	565,548
Indirect & Induced	388,552	227,688	506,576	1,122,816
Total	535,372	319,797	833,196	1,688,364
Labor Income ($billions)				
Direct	$13.2	$7.2	$19.4	$39.8
Indirect & Induced	$23.9	$12.0	$28.0	$64.0
Total	$37.2	$19.1	$47.4	$103.7
Contribution to GDP ($billions)				
Direct	$25.6	$31.2	$43.6	$100.4
Indirect & Induced	$40.0	$23.3	$56.7	$120.0
Total	$65.6	$54.5	$100.3	$220.4

Tax Payments of U.S. Mining

Economic activity attributable to U.S. mining is taxed at the federal, state and local levels. These taxes take a variety of forms, including income taxes on company profits and employee wages, property taxes on equipment and structures and excise taxes on output. Mining activity generated an estimated $18 billion in federal, state and local taxes in 2015 that supported direct, indirect and induced taxes of $44 billion.

1 Average wage and salary data from Bureau of Labor Statistics, Quarterly Census Employment and Wages, 2015. Labor income as presented in Table 1 results reflects total employee compensation (including benefits) and self-employment income for mining, support activities, and transportation attributable to mining output.

2 Data derived from IMPLAN model multipliers. IMPLAN data is based on U.S. Bureau of Economic Analysis data.

3 The transport of mining products, included in the figures above, represents a significant portion of these impacts. Transportation of mining output, for instance, is responsible for 210,180 direct transportation jobs and also contributes to labor income and GDP. These amounts have been distributed to coal, metal ore, and non-metallic mineral mining in Table 1.

Methodology

The economic contributions of U.S. mining to the domestic economy include its direct impact plus the economic activity of other industries that supply the mining industry. To quantify these linkages, we rely on the IMPLAN model, an input-output (I-O) model based on federal government data.

- Direct contributions: effects directly attributable to mining, such as the employment and output of mining companies. These effects include the transportation of mine output from the mine to the purchaser.
- Indirect contributions: effects of upstream suppliers to mining, including contractors and other companies providing inputs to mining companies, e.g. equipment manufacturers. Indirect effects also include the activity of suppliers to these companies.
- Induced contributions: spending by mining and supplier employees. Employees throughout the supply chain receive income associated with the direct and indirect activities, a portion of which is consumed. This consumption causes additional economic activity attributable to U.S. mining.

We have made adjustments to the output of the IMPLAN model to provide a more complete and accurate description of the overall contribution of U.S. mining.

See Appendix A for a more detailed description of our methodology.

This analysis can be considered conservative in that it does not include the economic or employee benefits from coal and uranium-based generation, or the manufacturing and other end-users of metal and non-metal minerals. According to the Edison Electric Institute, U.S. electricity generation directly and indirectly supported employment of more than one million people in 2015 and added $990 billion to the U.S. economy; coal and uranium are responsible for 53 percent of total electricity generation. The U.S. Geological Survey estimates that mineral commodities were transformed into $2.5 trillion worth of goods and services in 2015, an amount equal to 14 percent of the total U.S. GDP.

MINING AND THE U.S. ECONOMY BY STATE

Table 2. U.S. Mining Employment by State, 2015

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	10,026	151	4,751	14,928	22,118	37,046
Alaska	3,340	154	1,001	4,495	5,464	9,959
Arizona	17,673	465	4,343	22,482	43,184	65,666
Arkansas	3,410	18	2,409	5,837	8,079	13,916
California	11,112	138	11,167	22,418	76,712	99,129
Colorado	8,561	463	10,386	19,410	30,717	50,126
Connecticut	908	56	678	1,642	6,760	8,402
Delaware	154	0	61	215	2,133	2,348
District of Columbia	0	0	0	0	2,503	2,503
Florida	8,018	205	10,642	18,865	41,524	60,388
Georgia	8,468	196	4,067	12,731	26,567	39,298
Hawaii	441	0	275	716	2,946	3,662
Idaho	3,405	327	3,382	7,114	8,169	15,283
Illinois	10,070	565	7,080	17,715	47,027	64,742
Indiana	9,756	193	4,977	14,926	27,054	41,980
Iowa	4,036	41	1,424	5,502	7,872	13,373
Kansas	2,580	9	1,660	4,249	6,577	10,826
Kentucky	18,261	2,540	7,033	26,834	36,531	63,366
Louisiana	3,998	151	2,372	6,521	16,386	22,907
Maine	1,112	11	310	1,433	3,551	4,984
Maryland	4,042	513	1,884	6,439	19,176	25,615
Massachusetts	1,458	40	743	2,240	10,195	12,435
Michigan	5,461	165	8,381	14,006	36,233	50,239
Minnesota	9,740	605	11,767	22,112	41,376	63,488
Mississippi	1,519	0	769	2,288	6,945	9,233
Missouri	7,893	254	1,888	10,035	21,838	31,873
Montana	5,440	209	2,900	8,549	12,489	21,038
Nebraska	1,394	18	594	2,006	5,015	7,020
Nevada	15,898	2,073	7,091	25,062	30,186	55,248
New Hampshire	757	45	875	1,677	3,535	5,212
New Jersey	1,513	97	1,312	2,922	16,608	19,531
New Mexico	6,008	231	4,430	10,669	12,682	23,351
New York	4,877	51	7,023	11,951	36,953	48,903
North Carolina	5,655	38	1,936	7,629	23,280	30,909
North Dakota	2,612	207	1,297	4,115	5,665	9,781
Ohio	10,721	977	6,015	17,713	41,958	59,671
Oklahoma	3,425	104	2,459	5,988	10,866	16,854
Oregon	2,524	117	2,707	5,348	11,902	17,249
Pennsylvania	22,538	944	16,747	40,228	82,594	122,822
Rhode Island	291	11	179	481	2,099	2,580
South Carolina	2,678	10	2,220	4,908	13,205	18,113
South Dakota	1,374	37	590	2,001	3,213	5,214
Tennessee	6,482	274	1,844	8,600	19,350	27,950
Texas	22,363	508	12,279	35,151	86,997	122,147
Utah	10,243	916	4,530	15,690	27,333	43,022
Vermont	1,171	39	589	1,800	2,091	3,891
Virginia	10,225	522	6,820	17,566	35,535	53,101
Washington	3,441	116	1,450	5,008	13,837	18,845
West Virginia	24,628	986	6,317	31,930	31,505	63,435
Wisconsin	5,356	214	3,507	9,077	14,952	24,029
Wyoming	12,850	456	11,021	24,327	21,329	45,656
Total Operations	**339,906**	**15,462**	**210,180**	**565,548**	**1,122,816**	**1,688,364**

Table 3. U.S. Mining Labor Income by State, 2015 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	1,108	1,023	2,130
Alaska	287	260	547
Arizona	1,508	2,010	3,518
Arkansas	289	385	674
California	1,294	6,060	7,353
Colorado	1,378	1,672	3,051
Connecticut	85	512	598
Delaware	4	133	137
District of Columbia	0	262	262
Florida	758	2,631	3,388
Georgia	894	1,371	2,265
Hawaii	47	191	238
Idaho	331	298	629
Illinois	1,408	3,059	4,467
Indiana	1,165	1,336	2,501
Iowa	309	331	640
Kansas	187	316	502
Kentucky	2,022	1,633	3,655
Louisiana	513	889	1,402
Maine	40	158	198
Maryland	435	1,312	1,747
Massachusetts	139	910	1,049
Michigan	1,241	2,434	3,675
Minnesota	989	1,491	2,480
Mississippi	130	345	475
Missouri	665	1,033	1,697
Montana	746	556	1,302
Nebraska	130	269	399
Nevada	2,454	1,705	4,159
New Hampshire	84	234	318
New Jersey	215	2,048	2,263
New Mexico	743	564	1,307
New York	642	2,731	3,374
North Carolina	379	1,314	1,694
North Dakota	388	297	685
Ohio	1,313	2,223	3,536
Oklahoma	318	555	873
Oregon	324	713	1,037
Pennsylvania	2,726	4,134	6,859
Rhode Island	31	129	160
South Carolina	284	640	924
South Dakota	112	144	256
Tennessee	484	926	1,411
Texas	2,267	5,338	7,605
Utah	1,142	1,291	2,432
Vermont	85	86	171
Virginia	1,599	1,970	3,568
Washington	333	1,067	1,400
West Virginia	2,848	1,367	4,214
Wisconsin	564	672	1,236
Wyoming	2,323	938	3,261
Total Operations	**39,758**	**63,966**	**103,724**

Table 4. U.S. Mining Contribution to GDP by State, 2015 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	2,597	2,156	4,753
Alaska	1,281	604	1,884
Arizona	11,963	4,626	16,589
Arkansas	340	660	1,001
California	3,202	10,336	13,538
Colorado	4,099	3,571	7,671
Connecticut	109	965	1,074
Delaware	22	242	264
District of Columbia	12	427	439
Florida	1,481	3,894	5,375
Georgia	1,103	3,019	4,123
Hawaii	66	352	418
Idaho	1,155	667	1,822
Illinois	3,006	5,224	8,230
Indiana	2,405	2,707	5,112
Iowa	358	991	1,350
Kansas	710	1,050	1,761
Kentucky	3,603	2,774	6,377
Louisiana	1,172	1,673	2,845
Maine	43	275	318
Maryland	630	1,494	2,124
Massachusetts	263	1,825	2,088
Michigan	2,931	3,436	6,367
Minnesota	3,157	4,460	7,618
Mississippi	197	708	905
Missouri	674	1,994	2,668
Montana	1,629	983	2,612
Nebraska	189	549	738
Nevada	9,417	3,323	12,739
New Hampshire	113	384	497
New Jersey	241	2,197	2,439
New Mexico	1,821	1,216	3,037
New York	1,317	5,714	7,032
North Carolina	589	2,592	3,181
North Dakota	802	613	1,414
Ohio	2,792	4,087	6,879
Oklahoma	903	1,193	2,097
Oregon	588	1,458	2,046
Pennsylvania	4,765	6,604	11,370
Rhode Island	49	229	278
South Carolina	701	1,001	1,702
South Dakota	233	303	535
Tennessee	525	1,884	2,408
Texas	5,512	10,529	16,041
Utah	3,011	2,309	5,320
Vermont	117	215	332
Virginia	3,125	3,504	6,629
Washington	1,623	2,449	4,072
West Virginia	5,679	2,574	8,253
Wisconsin	1,745	1,946	3,691
Wyoming	6,318	2,053	8,370
Total Operations	**100,382**	**120,042**	**220,423**

U.S. COAL MINING BY STATE

Table 5. Coal Mining Employment by State, 2015

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	4,322	65	2,197	6,583	11,015	17,598
Alaska	120	8	40	168	696	864
Arizona	531	15	167	713	4,844	5,557
Arkansas	91	0	58	149	2,035	2,184
California	93	0	12	105	18,600	18,705
Colorado	2,398	129	1,196	3,723	9,255	12,977
Connecticut	7	0	0	7	2,100	2,107
Delaware	9	0	0	9	780	789
District of Columbia	0	0	0	0	888	888
Florida	471	16	0	487	11,775	12,262
Georgia	76	0	0	76	3,753	3,829
Hawaii	10	0	0	10	969	979
Idaho	14	0	0	14	370	384
Illinois	5,607	318	2,813	8,738	24,671	33,408
Indiana	5,269	101	2,098	7,467	14,448	21,915
Iowa	3	0	0	3	178	181
Kansas	31	0	16	47	1,093	1,139
Kentucky	14,524	1,229	4,075	19,828	26,077	45,905
Louisiana	644	26	407	1,078	6,545	7,623
Maine	0	0	0	0	1,160	1,160
Maryland	2,008	251	126	2,385	8,443	10,827
Massachusetts	2	0	0	2	1,222	1,224
Michigan	40	0	40	80	10,213	10,293
Minnesota	226	14	0	240	2,569	2,809
Mississippi	368	0	307	675	3,471	4,146
Missouri	279	12	148	439	3,965	4,405
Montana	1,464	61	712	2,237	4,351	6,588
Nebraska	0	0	0	0	1,339	1,339
Nevada	19	0	0	19	2,128	2,147
New Hampshire	8	0	0	8	888	896
New Jersey	50	0	0	50	5,000	5,050
New Mexico	1,263	46	604	1,914	3,479	5,393
New York	22	0	0	22	9,026	9,048
North Carolina	104	0	31	135	8,154	8,289
North Dakota	1,620	125	657	2,402	3,557	5,959
Ohio	4,393	392	1,421	6,206	17,645	23,851
Oklahoma	233	7	123	363	2,645	3,008
Oregon	58	0	0	58	2,390	2,448
Pennsylvania	11,727	494	7,127	19,347	40,193	58,540
Rhode Island	0	0	0	0	629	629
South Carolina	55	0	0	55	4,048	4,103
South Dakota	26	0	0	26	745	771
Tennessee	646	29	69	744	3,945	4,689
Texas	4,617	111	2,585	7,313	34,492	41,804
Utah	2,538	228	1,076	3,842	8,909	12,751
Vermont	2	0	0	2	64	66
Virginia	5,316	274	2,543	8,133	16,626	24,758
Washington	89	0	33	122	6,375	6,497
West Virginia	22,750	908	4,848	28,505	27,667	56,172
Wisconsin	25	2	0	27	828	855
Wyoming	8,274	297	3,695	12,267	12,294	24,561
Total Operations	**102,442**	**5,155**	**39,223**	**146,820**	**388,552**	**535,372**

Table 6. Coal Mining Labor Income by State, 2015 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	578	507	1,086
Alaska	11	50	61
Arizona	100	278	379
Arkansas	10	105	115
California	7	2,000	2,007
Colorado	321	548	869
Connecticut	1	163	163
Delaware	0	39	39
District of Columbia	0	107	107
Florida	24	1,000	1,024
Georgia	7	234	242
Hawaii	0	61	61
Idaho	1	17	19
Illinois	790	1,611	2,400
Indiana	692	710	1,402
Iowa	0	11	12
Kansas	4	61	65
Kentucky	1,584	1,175	2,760
Louisiana	101	366	467
Maine	0	44	44
Maryland	170	574	744
Massachusetts	0	361	361
Michigan	8	653	661
Minnesota	24	162	186
Mississippi	48	168	216
Missouri	71	221	292
Montana	173	181	354
Nebraska	0	80	80
Nevada	2	159	161
New Hampshire	0	56	56
New Jersey	5	800	805
New Mexico	184	165	349
New York	2	731	733
North Carolina	8	493	501
North Dakota	242	183	426
Ohio	532	950	1,482
Oklahoma	30	150	180
Oregon	0	139	139
Pennsylvania	1,573	2,298	3,870
Rhode Island	0	41	41
South Carolina	3	218	222
South Dakota	2	37	40
Tennessee	44	229	273
Texas	695	2,177	2,872
Utah	315	420	735
Vermont	0	3	3
Virginia	921	976	1,898
Washington	10	460	470
West Virginia	2,637	1,178	3,815
Wisconsin	2	47	50
Wyoming	1,274	551	1,824
Total Operations	**13,209**	**23,948**	**37,158**

Table 7. Coal Mining Contribution to GDP by State, 2015 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,218	1,045	2,262
Alaska	23	90	113
Arizona	300	525	825
Arkansas	14	169	183
California	9	2,885	2,893
Colorado	860	1,070	1,930
Connecticut	2	347	350
Delaware	1	84	85
District of Columbia	0	155	155
Florida	33	1,134	1,167
Georgia	20	652	672
Hawaii	0	110	110
Idaho	11	91	102
Illinois	1,296	2,475	3,771
Indiana	1,276	1,402	2,678
Iowa	7	231	238
Kansas	30	332	362
Kentucky	2,528	1,851	4,379
Louisiana	121	436	557
Maine	0	75	75
Maryland	221	664	885
Massachusetts	1	575	576
Michigan	6	578	584
Minnesota	73	472	545
Mississippi	76	340	415
Missouri	105	461	566
Montana	433	341	774
Nebraska	0	134	134
Nevada	2	184	186
New Hampshire	0	95	95
New Jersey	2	710	711
New Mexico	405	290	695
New York	5	1,690	1,696
North Carolina	8	690	698
North Dakota	525	349	873
Ohio	889	1,493	2,382
Oklahoma	74	289	363
Oregon	0	312	312
Pennsylvania	2,518	3,417	5,935
Rhode Island	0	71	71
South Carolina	3	251	254
South Dakota	6	60	66
Tennessee	68	506	574
Texas	1,360	4,183	5,542
Utah	611	715	1,326
Vermont	2	41	43
Virginia	1,499	1,606	3,105
Washington	15	546	560
West Virginia	5,206	2,253	7,459
Wisconsin	23	401	425
Wyoming	3,756	1,107	4,863
Total Operations	**25,640**	**39,981**	**65,621**

U.S. METAL ORE MINING BY STATE

Table 8. Metal Ore Mining Employment by State, 2015

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	46	0	39	85	1,012	1,097
Alaska	2,567	118	762	3,447	2,658	6,105
Arizona	13,474	356	1,934	15,764	28,882	44,646
Arkansas	592	0	8	600	1,176	1,776
California	1,357	21	763	2,142	14,302	16,443
Colorado	2,609	141	3,074	5,824	8,666	14,491
Connecticut	0	0	0	0	1,000	1,000
Delaware	72	0	0	72	490	562
District of Columbia	0	0	0	0	400	400
Florida	214	0	642	856	7,740	8,596
Georgia	0	0	0	0	2,500	2,500
Hawaii	0	0	0	0	400	400
Idaho	1,071	103	329	1,503	1,807	3,310
Illinois	0	0	0	0	3,700	3,700
Indiana	4	0	0	4	1,700	1,704
Iowa	18	0	0	18	1,026	1,044
Kansas	3	0	0	3	900	903
Kentucky	0	0	0	0	1,100	1,100
Louisiana	1,248	48	71	1,367	3,233	4,600
Maine	0	0	0	0	350	350
Maryland	0	0	0	0	1,600	1,600
Massachusetts	0	0	0	0	2,000	2,000
Michigan	1,900	59	5,717	7,675	13,836	21,511
Minnesota	6,223	385	10,416	17,024	29,630	46,654
Mississippi	0	0	0	0	700	700
Missouri	1,061	33	77	1,172	5,018	6,189
Montana	2,311	89	652	3,052	4,203	7,255
Nebraska	0	0	0	0	600	600
Nevada	13,298	1,733	3,543	18,575	20,470	39,044
New Hampshire	0	0	0	0	400	400
New Jersey	0	0	0	0	2,400	2,400
New Mexico	1,919	72	297	2,288	2,883	5,171
New York	98	0	9	107	5,782	5,889
North Carolina	18	0	54	72	2,763	2,835
North Dakota	0	0	0	0	280	280
Ohio	0	0	0	0	3,000	3,000
Oklahoma	0	0	0	0	1,000	1,000
Oregon	39	2	5	46	353	400
Pennsylvania	32	0	448	480	13,536	14,016
Rhode Island	0	0	0	0	250	250
South Carolina	195	0	347	542	2,145	2,687
South Dakota	235	11	34	280	615	895
Tennessee	1,463	59	142	1,664	4,767	6,430
Texas	1,797	39	155	1,991	10,063	12,054
Utah	3,550	318	410	4,278	7,971	12,249
Vermont	0	0	0	0	200	200
Virginia	306	14	153	473	4,354	4,826
Washington	456	14	76	546	1,625	2,171
West Virginia	11	0	147	158	312	469
Wisconsin	0	0	0	0	1,700	1,700
Wyoming	1	0	0	1	194	195
Total Operations	**58,188**	**3,616**	**30,305**	**92,109**	**227,688**	**319,797**

Table 9. Metal Ore Mining Labor Income by State, 2015 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	4	55	59
Alaska	226	137	362
Arizona	1,028	1,247	2,275
Arkansas	46	60	105
California	157	1,154	1,310
Colorado	473	416	889
Connecticut	0	77	77
Delaware	0	39	39
District of Columbia	0	42	42
Florida	60	500	560
Georgia	0	90	90
Hawaii	0	40	40
Idaho	48	33	81
Illinois	6	283	289
Indiana	0	99	99
Iowa	0	4	4
Kansas	0	29	29
Kentucky	0	29	29
Louisiana	177	189	367
Maine	0	18	18
Maryland	0	158	158
Massachusetts	0	38	38
Michigan	858	1,142	2,000
Minnesota	620	813	1,433
Mississippi	0	53	53
Missouri	82	151	232
Montana	363	216	579
Nebraska	0	32	32
Nevada	2,040	1,162	3,202
New Hampshire	0	56	56
New Jersey	0	600	600
New Mexico	147	120	267
New York	12	301	313
North Carolina	5	187	192
North Dakota	0	23	23
Ohio	0	183	183
Oklahoma	0	49	49
Oregon	0	116	116
Pennsylvania	8	227	235
Rhode Island	0	17	17
South Carolina	48	106	154
South Dakota	18	24	42
Tennessee	48	133	181
Texas	162	689	851
Utah	379	397	776
Vermont	0	2	2
Virginia	32	133	166
Washington	108	253	361
West Virginia	16	27	43
Wisconsin	0	18	18
Wyoming	0	12	12
Total Operations	**7,171**	**11,978**	**19,149**

Table 10. Metal Ore Mining Contribution to GDP by State, 2015 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	35	258	292
Alaska	1,118	348	1,466
Arizona	9,973	2,923	12,896
Arkansas	65	130	195
California	340	1,684	2,024
Colorado	1,775	971	2,746
Connecticut	0	177	177
Delaware	10	46	56
District of Columbia	0	80	80
Florida	79	630	709
Georgia	0	327	327
Hawaii	0	56	56
Idaho	497	148	645
Illinois	16	514	529
Indiana	0	217	217
Iowa	2	116	118
Kansas	0	101	101
Kentucky	0	133	133
Louisiana	448	289	737
Maine	0	38	38
Maryland	0	224	224
Massachusetts	1	294	295
Michigan	2,034	1,442	3,476
Minnesota	2,599	2,882	5,480
Mississippi	0	76	76
Missouri	80	402	482
Montana	797	331	1,128
Nebraska	0	71	71
Nevada	8,382	2,382	10,764
New Hampshire	0	49	49
New Jersey	0	363	363
New Mexico	544	273	817
New York	50	880	931
North Carolina	6	354	360
North Dakota	0	35	35
Ohio	0	372	372
Oklahoma	0	126	126
Oregon	24	176	199
Pennsylvania	12	455	466
Rhode Island	0	36	36
South Carolina	94	163	256
South Dakota	37	47	85
Tennessee	21	378	398
Texas	168	730	695
Utah	1,497	528	2,228
Vermont	0	19	19
Virginia	109	363	472
Washington	332	401	734
West Virginia	47	71	118
Wisconsin	0	195	195
Wyoming	0	28	28
Total Operations	**31,192**	**23,331**	**54,523**

U.S. NON-METALLIC MINERALS MINING BY STATE

Table 11. Non-metallic Mineral Mining Employment by State, 2015

State	Direct Effects				Indirect and Induced	Total Contribution
	Mine Workers	Support Activities	Transportation	Total Direct		
Alabama	5,658	87	2,515	8,259	10,091	18,351
Alaska	653	28	199	880	2,110	2,991
Arizona	3,668	94	2,242	6,005	9,458	15,462
Arkansas	2,727	18	2,343	5,088	4,868	9,956
California	9,662	117	10,392	20,171	43,810	63,982
Colorado	3,554	193	6,116	9,863	12,796	22,659
Connecticut	901	56	678	1,635	3,660	5,295
Delaware	73	0	61	134	864	998
District of Columbia	0	0	0	0	1,215	1,215
Florida	7,333	189	10,000	17,522	22,009	39,531
Georgia	8,392	196	4,067	12,655	20,314	32,969
Hawaii	431	0	275	706	1,577	2,283
Idaho	2,320	224	3,053	5,596	5,993	11,590
Illinois	4,463	247	4,267	8,978	18,656	27,633
Indiana	4,483	92	2,880	7,455	10,906	18,361
Iowa	4,015	41	1,424	5,481	6,668	12,148
Kansas	2,546	9	1,645	4,200	4,585	8,784
Kentucky	3,737	311	2,958	7,007	9,354	16,360
Louisiana	2,106	77	1,893	4,077	6,608	10,685
Maine	1,112	11	310	1,433	2,041	3,474
Maryland	2,034	262	1,758	4,055	9,133	13,188
Massachusetts	1,456	40	743	2,238	6,973	9,211
Michigan	3,521	106	2,624	6,251	12,184	18,435
Minnesota	3,291	206	1,352	4,848	9,178	14,026
Mississippi	1,151	0	462	1,613	2,774	4,387
Missouri	6,553	209	1,662	8,424	12,855	21,279
Montana	1,665	59	1,536	3,261	3,935	7,195
Nebraska	1,394	18	594	2,006	3,076	5,081
Nevada	2,581	339	3,548	6,468	7,589	14,057
New Hampshire	749	45	875	1,669	2,247	3,916
New Jersey	1,463	97	1,312	2,872	9,208	12,081
New Mexico	2,826	113	3,528	6,467	6,319	12,786
New York	4,757	51	7,014	11,822	22,145	33,967
North Carolina	5,533	38	1,851	7,422	12,363	19,785
North Dakota	992	82	639	1,713	1,828	3,542
Ohio	6,328	585	4,595	11,507	21,313	32,820
Oklahoma	3,192	97	2,336	5,625	7,221	12,846
Oregon	2,427	114	2,702	5,243	9,158	14,402
Pennsylvania	10,779	450	9,172	20,401	28,865	49,266
Rhode Island	291	11	179	481	1,220	1,701
South Carolina	2,428	10	1,873	4,312	7,012	11,324
South Dakota	1,113	26	557	1,696	1,852	3,548
Tennessee	4,373	186	1,633	6,192	10,638	16,830
Texas	15,949	359	9,539	25,847	42,442	68,288
Utah	4,155	370	3,044	7,569	10,453	18,022
Vermont	1,169	39	589	1,798	1,827	3,625
Virginia	4,603	234	4,124	8,961	14,556	23,517
Washington	2,896	102	1,341	4,339	5,838	10,177
West Virginia	1,867	78	1,322	3,267	3,527	6,794
Wisconsin	5,331	213	3,507	9,050	12,424	21,475
Wyoming	4,575	159	7,325	12,059	8,841	20,900
Total Operations	**179,276**	**6,691**	**140,653**	**326,619**	**506,576**	**833,196**

Table 12. Non-metallic Mineral Mining Labor Income by State, 2015 (millions of dollars)

State	Direct Contribution to Labor Income	Indirect and Induced	Total Contribution
Alabama	525	460	985
Alaska	50	73	123
Arizona	380	485	865
Arkansas	234	221	454
California	1,130	2,906	4,036
Colorado	585	708	1,293
Connecticut	85	273	357
Delaware	4	55	59
District of Columbia	0	113	113
Florida	673	1,131	1,804
Georgia	887	1,046	1,933
Hawaii	47	90	137
Idaho	282	247	529
Illinois	612	1,166	1,778
Indiana	473	527	1,000
Iowa	309	316	625
Kansas	182	226	408
Kentucky	437	429	866
Louisiana	235	334	568
Maine	40	96	136
Maryland	265	580	844
Massachusetts	139	511	650
Michigan	375	638	1,013
Minnesota	345	517	862
Mississippi	82	124	206
Missouri	512	661	1,173
Montana	210	159	369
Nebraska	130	157	287
Nevada	412	384	796
New Hampshire	84	122	206
New Jersey	210	648	858
New Mexico	411	280	691
New York	629	1,699	2,328
North Carolina	366	635	1,000
North Dakota	146	91	236
Ohio	780	1,091	1,871
Oklahoma	288	356	644
Oregon	324	458	782
Pennsylvania	1,145	1,609	2,754
Rhode Island	31	71	102
South Carolina	233	315	548
South Dakota	92	83	175
Tennessee	393	564	956
Texas	1,411	2,472	3,883
Utah	447	474	921
Vermont	85	82	166
Virginia	645	860	1,505
Washington	214	355	569
West Virginia	194	162	356
Wisconsin	562	607	1,168
Wyoming	1,050	375	1,425
Total Operations	**19,377**	**28,040**	**47,418**

Table 13. Non-metallic Mineral Mining Contribution to GDP by State, 2015 (millions of dollars)

State	Direct Contribution to GDP	Indirect and Induced	Total Contribution
Alabama	1,344	854	2,198
Alaska	140	166	305
Arizona	1,691	1,178	2,868
Arkansas	261	361	623
California	2,853	5,768	8,621
Colorado	1,464	1,531	2,995
Connecticut	107	441	548
Delaware	12	111	122
District of Columbia	12	192	204
Florida	1,369	2,130	3,499
Georgia	1,083	2,041	3,124
Hawaii	66	186	252
Idaho	647	428	1,075
Illinois	1,694	2,235	3,929
Indiana	1,129	1,088	2,217
Iowa	349	644	993
Kansas	681	617	1,298
Kentucky	1,075	790	1,865
Louisiana	603	947	1,551
Maine	43	162	205
Maryland	409	606	1,015
Massachusetts	261	956	1,217
Michigan	891	1,417	2,307
Minnesota	486	1,107	1,592
Mississippi	121	293	414
Missouri	490	1,130	1,620
Montana	399	311	710
Nebraska	189	344	533
Nevada	1,032	757	1,789
New Hampshire	113	240	353
New Jersey	239	1,125	1,364
New Mexico	871	653	1,524
New York	1,262	3,144	4,405
North Carolina	575	1,548	2,123
North Dakota	277	229	506
Ohio	1,903	2,221	4,124
Oklahoma	830	778	1,608
Oregon	565	970	1,535
Pennsylvania	2,235	2,733	4,968
Rhode Island	49	122	171
South Carolina	604	588	1,192
South Dakota	189	196	385
Tennessee	436	1,000	1,436
Texas	3,984	5,819	9,803
Utah	902	863	1,765
Vermont	114	155	269
Virginia	1,516	1,536	3,051
Washington	1,276	1,502	2,778
West Virginia	426	251	676
Wisconsin	1,722	1,349	3,071
Wyoming	2,562	918	3,480
Total Operations	**43,550**	**56,729**	**100,279**

Details Regarding Methodology and Data

To evaluate the overall economic contribution of U.S. mining in 2015, we followed two general steps: first, derive the direct impacts of mining using MSHA preliminary 2015 data; and second, apply the IMPLAN model's multipliers to capture a more complete estimate of the overall impact.

Derivation on Direct Impacts

As described in the report, the IMPLAN model produces economic multipliers to calculate the overall economic contribution of U.S. mining in terms of the direct, indirect and induced impacts. For U.S. mining, the codes in the IMPLAN model align with the NAICS codes presented in the report for the definition of the U.S. mining industry (see Appendix D).

The IMPLAN model relies on employment data from the U.S. Bureau of Economic Analysis (BEA). However, the Mine Safety and Health Administration (MSHA) also collects information on mining industry employment. We believe that the MSHA data more accurately reflect the true direct employment situation of the mining industry. We have applied IMPLAN multipliers to the MSHA data to derive indirect and induced impacts and rounded employment data to the nearest 10 employees.

The BEA classifies contractor activity closely related to mining, such as contract blasting and drilling, in the "Support Activities for Mining" sector (NAICS 213113, 213114, and 213115). These codes also include some activity completed by the mine operator on a fee or contract basis. More generalized services that could be offered to a variety of industries are classified in the industry code associated with the activity, such as Construction (NAICS 23). The IMPLAN model does not break the Support Activities for Mining sector into the coal, metal and non-metallic minerals segments. We allocated the overall activity to the sectors based on national estimates from MSHA and the direct employment of mine workers in each sector.

Data on the contribution to GDP and labor income by state are derived from the IMPLAN model 2012 multipliers applied to fourth quarter 2015 MSHA data.

Adjustments to IMPLAN Model

Economic multipliers are designed to measure the overall change in production that would result from a marginal increase in a particular industry. For example, an output multiplier converts a $1 million increase in output of the mining sector into the total change in output throughout the supply chain. Because some suppliers of U.S. mining might rely on mining for inputs, a marginal change in the mining sector could lead to an additional change in mining activity attributable to the goods it provides its suppliers throughout the economy. This impact is appropriate to include when modeling a marginal change, but when evaluating the overall impact of the industry, these indirect, own-industry impacts should be excluded to prevent double-counting. Therefore, we have adjusted the IMPLAN model results to exclude any indirect or induced effects taking place in the mining industry.

I-O models capture the upstream relationships, but certain downstream impacts are not reflected in the economic multipliers. Some of these effects, such as the transportation of mine output to the purchaser, could be attributable to U.S. mining. To capture the economic activity associated with the transportation of mining output, we have relied on sector-specific transportation margins in the IMPLAN model. Based on these margins, we have estimated the direct, indirect, and induced economic activity associated with this activity at a state level.

Because IMPLAN state models capture only the indirect and induced effects within each state, the indirect and induced effects crossing state borders ("cross-state spillover effects") are not captured by the IMPLAN state models. As such, the state-level indirect and induced impacts calculated by the IMPLAN state models must be adjusted to add up to the overall impact captured by the national model, which includes the cross-state effects. We therefore allocated the cross-state indirect and induced employment, labor income, and contribution to GDP effects across the 50 states and the District of Columbia in proportion to each state's share of the total national employment, labor income, and contribution to GDP by industry. The state level indirect and induced effects reported throughout this study include such allocations of cross-state spillover effects.

Appendix A. NAICS Definition of U.S. Mining

Mining Division	Detail	NAICS Code	Description
Coal	Bituminous Coal and Lignite Surface Mining Bituminous Coal Underground Mining Anthracite Mining	212111 212112 212113	This segment includes establishments engaged in: (1) mining bituminous coal, anthracite, and lignite by underground mining, auger mining, strip mining, culm bank mining, and other surface mining; (2) developing coal mine sites; and (3) beneficiating (i.e., preparing) coal.
Metal Ore Mining	Iron Ore Mining Goal Ore Mining Silver Ore Mining Lead Ore and Zinc Ore Mining Copper Ore and Nickel Ore Mining Uranium-Radium-Vanadium Ore Mining All Other Metal Ore Mining	212210 212221 212222 212231 212234 212291 212299	This segment includes establishments primarily engaged in developing mine sites or mining metallic minerals, and establishments primarily engaged in ore dressing and beneficiating operations, such as crushing, grinding, washing, etc. Beneficiating may be performed at mills operated in conjunction with the mines served or at mills operated separately.
Non-metalic Mineral Mining and Quarrying	Dimension Stone Mining/Quarrying Crushed/Broken Limestone Mining/Quarrying Crushed/Broken Granite Mining/Quarrying Other Crushed, Broken Stone Mining/Quarry Construction Sand and Gravel Mining Industrial Sand Mining Kaolin and Ball Clay Mining Clay, Ceramic, Refractory Minerals Mining Potash, Soda, and Borate Mineral Mining Phosphate Rock Mining Other Chemical and Fertilizer Mineral Mining All Other Non-metallic Mineral Mining	212311 212312 212313 212319 212321 212321 212324 212325 212392 212392 212393 212399	This segment includes establishments primarily engaged in developing mine sites, or in mining or quarrying non-metallic minerals (except fuels). Also included are certain well and brine operations, and preparation plants primarily engaged in beneficiating non-metallic minerals.
Support Activities for Coal, Metal, and Non-metallic Mining	Support Activities for Coal Mining Support Activities for Metal Mining Support Activities for Non-metallic Minerals Mining	213113 213114 213115	This segment includes establishments primarily engaged in providing support activities for coal, metal, and non-metallic mining (except site preparation and related construction activities) on a contract or fee basis. Exploration for coal is included in this industry. Contract activities can be performed in-house by mining operators.

Source: Census Bureau, North American Industry Classification System (NAICS)

Appendix B. The IMPLAN Model

IMPLAN is a well-known modeling system developed by the Minnesota IMPLAN Group for estimating economic impacts and is similar to the Regional Input-Output Modeling System developed by the U.S. Department of Commerce. The model is primarily based on government data sources. It can address a wide range of impact topics in a given region (county, state) or the country as a whole.

IMPLAN is built around an "input-output" table that relates the purchases that each industry has made from other industries to the value of the output of each industry. To meet the demand for goods and services from an industry, purchases are made in other industries according to the patterns recorded in the input-output table. These purchases in turn spark still more purchases by the industry's suppliers, and so on. Meanwhile, employees and business owners make personal purchases out of the additional income that is generated by this process, further increasing demand that ripples through the economy. Multipliers describe these iterations. The Type I multiplier measures the direct and indirect effects of a change in economic activity. It captures the inter-industry effects only, i.e., industries buying from local industries. The SAM (Social Accounting Matrix) multiplier captures the direct and indirect effects. In addition, it also reflects induced effects (i.e. changes in spending from households as income increases or decreases due to the changes in production).

National Mining Association
101 Constitution Avenue, NW
Suite 500 East
Washington, D.C. 20001
(202) 463-2600 | www.nma.org