

2023-2024



WYOMING MINING
ASSOCIATION

CONCISE GUIDE TO WYOMING COAL

The Concise Guide to Wyoming Coal is produced by the Wyoming Coal Information Committee of the Wyoming Mining Association. Cheyenne, Wyoming.

wyomingmining.org

WELCOME



The Concise Guide highlights the economic contribution and value of Wyoming's coal industry.

A CULTURE OF SAFETY

Safety is not simply a priority, but a core cultural value for Wyoming's coal mining industry. Wyoming's coal mines are recognized as some of the safest mining operations in the nation and the world. Safe mines are productive mines, and the Wyoming coal industry is committed to providing a safe working environment for all employees and contractors.

All Wyoming coal mines employ dedicated safety professionals, and all employees are trained in proper safety practices to foster a safe work environment and build and maintain the culture of safety.

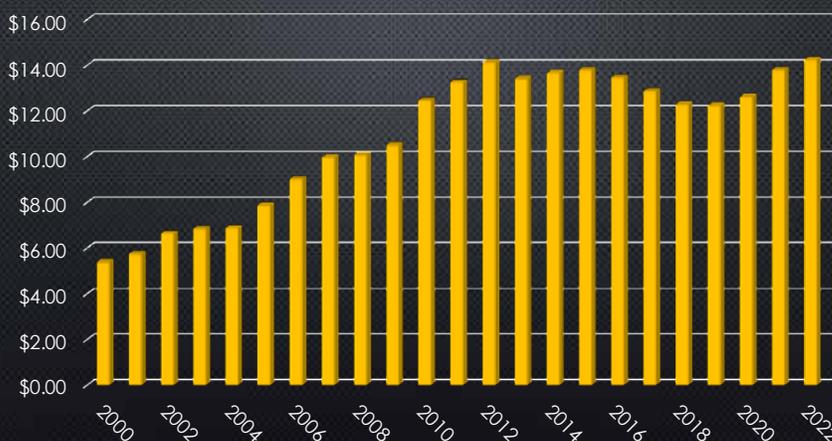
- All new employees attend 40 hours of safety training prior to their first day on the job.
- All employees participate regularly in safety refresher training.
- Every shift starts with safety briefings and walk-around inspections.
- Employees earn safety bonuses to encourage safe and vigilant work practices.
- The Mine Safety and Health Administration regulates all Wyoming mines.

In the continued COVID-19 environment, all coal mining operations have policies and procedures in place to maintain a safe working environment for their miners.

Wyoming has led the nation in coal production since 1986 and **CURRENTLY MINES 41% OF AMERICA'S COAL.**



WYOMING COAL PRICES (2000-2022)



WYOMING COAL

WYOMING COAL INDUSTRY IN 2023

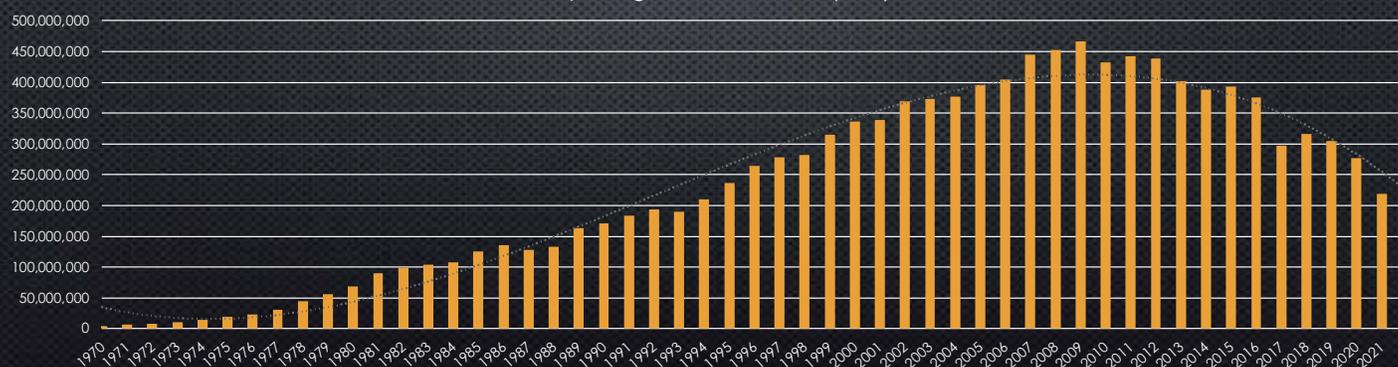
Wyoming has led the nation in coal production since 1986. The industry continues to lead even in an environment of long-term structural change in the industry. Strong competition with low natural gas prices and new combined-cycle natural gas generation capacity, along with regulatory pressures has weakened coal's market share over the past two decades. Coal production in the United States peaked in 2008 at 1.17 billion tons and has since declined 49 percent. Conversely, natural gas consumption for electrical power generation grew a staggering 206 percent between 2005 and 2022. Additionally, increased competition from heavily subsidized renewables, restrictive regulations from Washington D.C. and state energy portfolio mandates in customer states has diminished the demand for Wyoming coal. Following a near-term low in coal production in the 2020 pandemic year, renewed demand for electricity has pushed up natural gas prices significantly and re-energized demand for lower cost thermal coal. Wyoming coal production increased by 5 million tons in 2022, up 2.4 percent over the previous year. Unfortunately, rail transportation was unable to accommodate the unexpected increase in demand resulting in an estimated 60 million tons of lost production.

Coal continues to provide stable baseload generating capacity that helps to compensate for the unreliability of renewable electricity production. Despite the uncertainties, coal remains a secure, abundant and affordable source of fuel and a significant source of energy, generating an estimated 22 percent of the nation's electricity. Based on estimates by the Energy Information Administration, coal's share of power generation could possibly drop to about 5 percent of total electricity generation by 2050 unless there is a substantial change in direction in energy policy and environmental pressures from federal regulatory agencies.

Wyoming's mines, operating leaner and more efficient than ever, remain America's low-cost industry leaders and will continue to offer low-cost fuel for power generating facilities with long operating life-spans. Home to 7 of the nation's top 10 producing mines, Wyoming provides about 41 percent of all thermal coal used for electricity production in America. That translates to about 9.6 percent of U.S. domestic electric power generation.

WYOMING COAL PRODUCTION (1969-2022)

Wyoming Coal Production (tons)



WYOMING'S COAL RESOURCES

Wyoming is home to over 1.4 trillion tons of total coal resources in seams ranging in thickness from 5 feet to some in excess of 200 feet in the Powder River Basin (PRB). Recent estimates from the Wyoming Geological Survey give Wyoming more than 165 billion tons of recoverable coal. While other regions of the country also

WYOMING provides about **41% OF ALL THERMAL COAL** used for electricity production in the **NATION**.

hold considerable resources, Wyoming's position as the nation's largest and most productive coal region is attributed to several factors:

- Low sulfur composition of the coal.
- Lower production costs due to the coal's proximity to the surface.
- World-class recoverable coal seams.
- Efficient rail infrastructure.

During 2022, 222 million tons of coal moved by unit trains (single destination trains with up to 150 cars) to energy markets in 24 states across the country. Wyoming power plants consumed another 19 million tons during the year, and 3 million tons went to other uses.

- On average, coal is mined at the staggering rate of 12 tons per second.
- On average, 10 unit trains leave the PRB daily (down significantly from higher production years).
- Rather than stopping, trains are loaded as they move through the loading chute at speeds up to two mph.
- It takes less than one minute to load a train car and about ninety minutes to load a unit train.

While most newly constructed power plants are designed to operate on natural gas, coal will continue to provide a significant portion of baseload generating capacity for the foreseeable future. Fuel switching, or changing between natural gas and coal for power, is limited as many existing plants are either not designed to operate on natural gas or they do not currently have a pipeline to deliver the quantity of gas needed for operations.

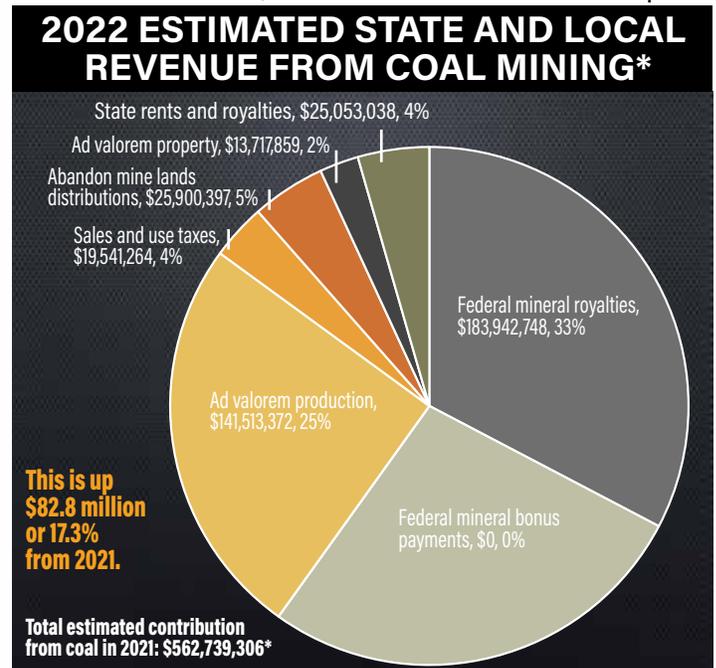
The estimated average price for Wyoming coal in 2022 was \$14.25 per ton, up \$0.45 per ton from 2021. The sharp and unexpected increase in natural gas prices in the fall of 2021 spurred demand for Wyoming coal. Spot prices jumped to over \$33 per short ton in the 4th quarter of 2021 before returning to normal levels in the 2nd quarter of 2022. Prices had stabilized at just over \$16 per ton in the 3rd quarter of 2022. Wyoming mines adapted quickly to meet demand, including a significant increase in hiring. However, rail service was unable to adapt adequately resulting in a lack of necessary cars to meet increased utility demands. Inconsistent service by the railroads caused mines to revise production figures downward and has resulted in stranded tonnage and significant lost revenue to the state of Wyoming and local governments. Reliable and timely rail service remains a considerable barrier to increased production for Wyoming's PRB coal mines even with demand for coal being high.

OUTLOOK FOR THE FUTURE

Coal is a reliable and economically efficient energy source that will continue to be used for decades. The Department of Energy's Annual Energy Outlook 2023 predicts that U.S. coal production for electricity will halve by 2050. Yet coal will remain a strong fuel source in America's energy mix. Coal was the power source for about 22 percent of the nation's electricity in 2022. Electrical power generation is by far the largest consumer of coal in the United States, using about 86 percent of all coal mined.

Wyoming has emerged as a national leader in coal technology development and research. The State of Wyoming has partnered with several utility cooperatives to create a public-private partnership to study the capture and use of carbon dioxide emissions at the Wyoming Integrated Test Center (ITC), now administered by the School of Energy Resources (SER). Using 20 MW of coal-based flue gas, research conducted at the ITC is discovering new and more economical ways to capture CO2 from power plants processes as well as commercial uses of carbon dioxide. Kawasaki Heavy Industries' carbon capture pilot project at the ITC at Dry Fork Station is underway and Membrane Technology Research's large scale pilot is currently under construction, with several other technologies planning to test at the ITC over the coming year.

Other projects are being pursued throughout the state and at the SER to identify other means to use Wyoming coal - this program is called 'carbon engineering'. SER and its collaborators in the College of Engineering and Physical Sciences and the College of Agriculture are focused on large-scale applications designed for Wyoming coal, such as soil amendments, construction materials and asphalt.



The state of Wyoming is supporting the School of Energy Resources to demonstrate one of these technologies at the Wyoming Innovation Center (WylC) in Campbell County to demonstrate one such coal to products technology with more expected in the future. WylC features two buildings and seven demonstration sites for pilot plants. The WylC will focus on evaluating the commercial viability of high-value nonfuel, low- or zero-emissions products made from coal and extracting rare earth elements found in the fly ash of coal burned at local power plants. WylC's first tenant is the National Energy Technology Laboratory on a project that is in collaboration with the SER.

In addition to carbon capture, use and storage, and the carbon engineering program SER is also working on identifying unconventional sources of rare earths and critical minerals associated with Wyoming and the region's coal basins.

REGULATORY & TAX ENVIRONMENT

The industry is experiencing significant negative regulatory and policy pressure from the Biden Administration. Even with the US Supreme Court curtailing the Environmental Protection Agency's (EPA) perceived authority to regulate CO2 under the Clean Air Act, the agency has signaled its intention to move ahead. With its intention to replace the American Clean Energy (ACE) rule promulgated under the Trump Administration as a replacement to the Clean Power Plan (CPP). The Biden EPA recently announced this year their intention to move forward with a so called "Clean Power Plan 2.0" rule which will force utilities to further announce coal generating units retirement dates or switch to currently unavailable technologies without any consistent path forward on regulatory approval. We can be assured it will place great pressure on utilities to further reduce Wyoming coal use at generating facilities across the country. The agency has also moved forward on a revised Waters of the US (WOTUS) rule to the regulatory burden on the coal industry. The moratorium on the US Bureau of Land Management's Federal Coal Leasing program remains in effect placing any new leasing of federal coal assets on hold. With an estimated 10-15 years of production remaining on existing leases and an estimated time frame of 7-10 years for approval of new leases, future efforts to meet necessary demand are problematic. In the short term, operators are pursuing lease modifications to acquire more coal, but these have largely been stymied by the Bureau of Land Management and Office of Surface Mining.

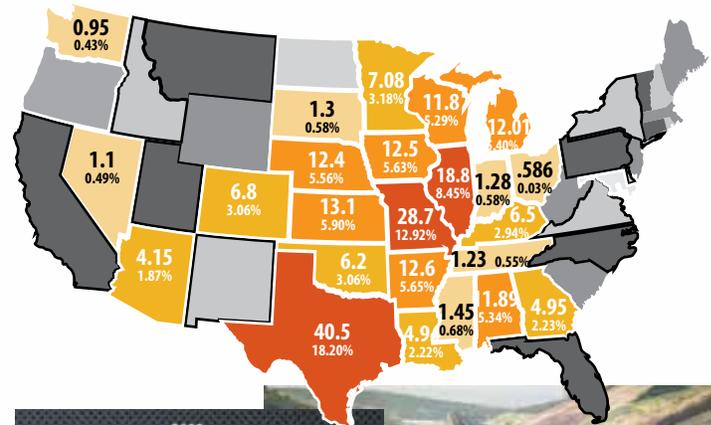
Several pieces of legislation have been introduced in Congress that threaten the long-term health of the coal industry. Two bills that would have significant effect on Wyoming coal would reinstitute a moratorium on the Federal Coal Leasing Program, as well as to eliminate the option of self-bonding. Also, Congress has widely been rumored to be considering in developing a so called "Clean Energy Standard" that would accel-

ate the closure of coal generating facilities across the nation. In fact, this concept was formally part of the original Biden Administration "Build Back Better" Reconciliation package discussions. This standard would have an incredibly harmful impact on Wyoming coal production, as most of the coal in the state is used for domestic power consumption.

The industry is also closely watching congressional actions on tax related issues, that could have a damaging cost on operating budgets. The recently passed "Inflation Reduction Act" included a large increase in the Federal Black Lung Excise Tax, as well as eliminating certain extraction industry tax deductions that allow for price competitiveness. Yet despite the strong headwinds from Washington D.C. the industry remains optimistic that the reality of baseload generation will have to be factored into any long-term policy decisions, and that coal will play a vital role in America's energy mix for decades to come.

More locally, coal remains a prime source of revenue for state and local governments. Unfortunately, with the state of Wyoming continuing to face a troubling revenue picture for the foreseeable future, legislative efforts to increase tax burdens remain a concern for the industry.

WYOMING COAL SHIPMENTS 2022



| Rank | State | 2022 Tons | Percent |
|-------------|-------|-------------|---------|
| 1 | TX | 40,474,568 | 18.20 |
| 2 | MO | 28,736,747 | 12.92 |
| 3 | IL | 18,797,383 | 8.45 |
| 4 | KS | 13,126,049 | 5.90 |
| 5 | AR | 12,538,626 | 5.65 |
| 6 | LA | 12,518,935 | 5.63 |
| 7 | NE | 12,357,519 | 5.56 |
| 8 | MI | 12,012,828 | 5.40 |
| 9 | AL | 11,882,215 | 5.34 |
| 10 | WI | 11,759,690 | 5.29 |
| 11 | MN | 7,080,939 | 3.18 |
| 12 | CO | 6,809,465 | 3.06 |
| 13 | KY | 6,539,110 | 2.94 |
| 14 | OK | 6,186,368 | 2.78 |
| 15 | GA | 4,951,121 | 2.23 |
| 16 | LA | 4,942,875 | 2.22 |
| 17 | AZ | 4,148,715 | 1.87 |
| 18 | MS | 1,595,700 | 0.72 |
| 19 | SD | 1,299,430 | 0.58 |
| 20 | IN | 1,279,952 | 0.58 |
| 21 | TN | 1,231,369 | 0.55 |
| 22 | NV | 1,100,117 | 0.49 |
| 23 | WA | 949,202 | 0.43 |
| 24 | OH | 58,542 | 0.03 |
| Grand Total | | 222,397,465 | 100 |

THE COMMUNITY & COAL

LOCAL BENEFITS

Coal is the third most important source of revenue for Wyoming state and local governments, after oil and gas. Coal mining companies remit taxes and royalty payments to all branches of government, federal, state and local. Coal's estimated contribution to Wyoming in 2022 was about \$563 million in taxes, royalties and fees, reflecting an \$83 million, or 17.3 percent, increase from 2021. The increase represents a slight rebound in the recent slowdown in Wyoming's coal industry. We believe 2021 could be a near-term low and future years will be stronger.

In 2022, Wyoming received \$25.9 million in "certified in lieu" funds. These are monies that are authorized as "replacement" funds based on AML collections that are no longer distributed.

Employment in Wyoming's 15 operating coal mines increased 4 percent in 2022. Wyoming coal mines employ 5,167 workers directly in the industry. This is down 26 percent from a peak of 7,004 employees in 2011. Coal industry jobs are among the best paying in the state with Wyoming coal miners collecting an average wage of \$98,057 excluding benefits. A coal miner's take-home pay is almost twice the statewide average wage of \$56,330 per worker. Estimates indicate that each coal industry position supports an additional two jobs in the service and supply sectors, bringing direct and indirect employment to more than 15,000 workers.

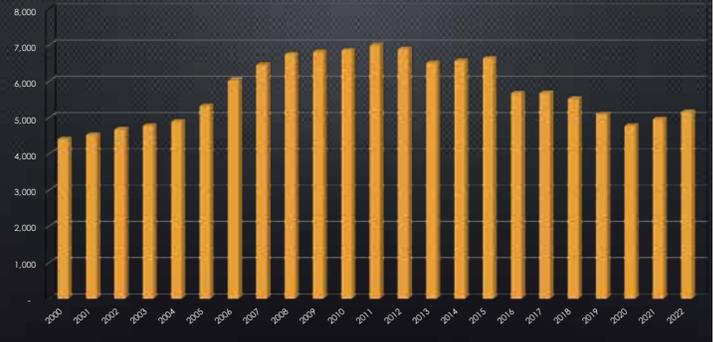
LEASE BONUS BIDS

Leasing federal coal reserves is a detailed, time consuming and highly-regulated process. Each proposed lease must be requested through the Bureau of Land Management (BLM) in a Lease by Application (LBA) request. A mining company nominates proposed tracts for lease and the BLM completes detailed environmental assessments or environmental impact statements.

The BLM assesses proposals to determine the coal's market value, scope of the application and establishes sale parameters. Interested companies with the ability to economically and viably mine the coal submit competitive bids. The lease is either awarded to the highest bidder or rejected if the BLM deems the offer too low.

Successful bidders for a coal lease pay a bonus bid for each ton of reserves. This is an additional payment on top of the royalty paid to the federal government when the coal is mined. Coal lease payments are split between the state and federal government and paid out over a five-year period.

WY COAL MINING EMPLOYMENT (2000-2022)



WY WAGES: AVERAGE EARNINGS PER JOB (2001-2022)



Coal mining employment in Wyoming INCREASED 3.94% IN 2022.

Each coal industry position supports an additional TWO JOBS in the service and supply sectors.

Wyoming has received more than \$2.3 billion in coal bonus bid dollars since 2003. The money has funded most new schools built in the last decade, as well as highways and community colleges across the state. Every Wyoming county has benefited from these funds.

Unfortunately, as a result of decreased coal demand, this revenue stream has significantly declined. There were no payments in 2022. There are only three potential leases currently on hold in the BLM LBA system. And with the reinstatement of the moratorium on leasing, State revenue from coal will continue to be impacted.

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RECLAMATION

Reclaimed mine lands represent sustainable development in action, and Wyoming coal mine reclamation remains among the best in the world. Reclamation is done contemporaneously in a multi-stage process once the recoverable coal is removed. Highly-trained specialists employed by the mines manage the reclamation, and state and federal personnel provide oversight to ensure compliance with all applicable laws. Reclamation at Wyoming coal mines has been recognized with multiple awards as the best in the nation. All Wyoming coal mines are fully bonded with the Wyoming Department of Environmental Quality.

Reclamation stages include:

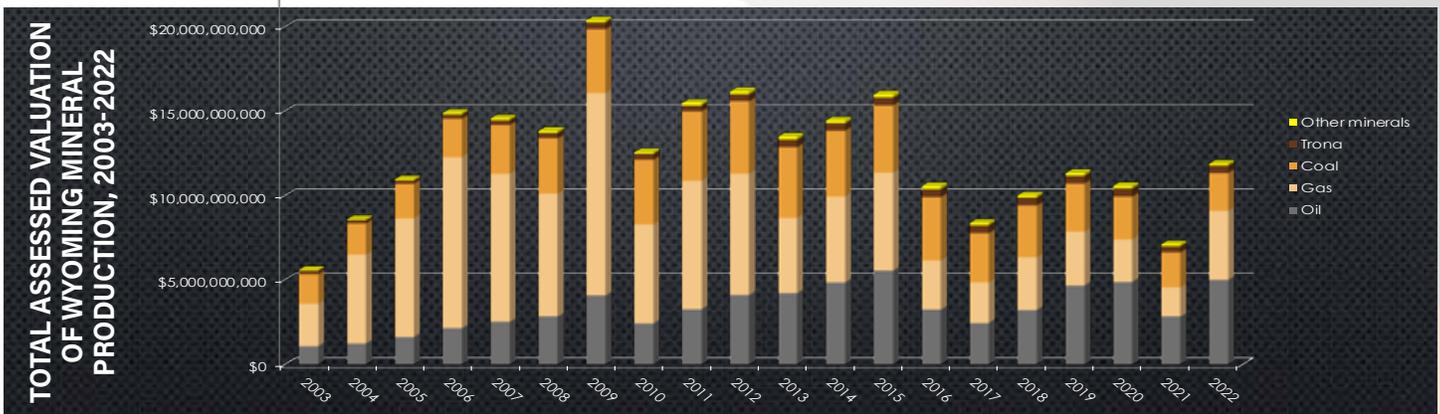
- Backfilling the void with overburden during the mining process.
- Contouring the filled surface.
- Replacing topsoil and preparing the surface.
- Preparing the seedbed and sowing approved seed mixtures.
- Monitoring plant growth and fauna populations.

Approved seed mixtures used in reclamation promote higher vegetative output than what is found on pre-mined land, at-

tracting animals and plants to re-establish and promote a sustainable ecosystem. The success of reclamation is apparent on reclaimed land in the Powder River Basin and at other sites across Wyoming, such as PacifiCorp's project near the Dave Johnson power plant at Glenrock.

Land which houses facilities such as mine shops, coal plants, long-term roads, and ponds is included in the lease permit, but cannot be reclaimed until long-term use is complete. Reclamation focuses on all other areas, as demonstrated by comparison of current disturbance and reclamation acres year to year. Reclamation goes beyond just restoring contours and reseeding native plant species. Reclamation specialists strive to build sustainable natural ecosystems using innovative methods and new techniques to further enhance reclaimed areas. Some examples include:

- Re-establishment of water features and storage in reclaimed streams, stock ponds and wetlands.
- Replacement of sage grouse breeding grounds.
- Establishment of mosaic patterns in grassland and shrubland reclamation.
- Replacement of rock outcrops and providing prey base habitats for eagles and other predators.
- Reconstruction of prairie dog towns and reclamation of mountain plover habitat.



2022 WYOMING PRODUCTION BY COUNTY

| Location/operator | Mine | Employees | Production |
|---------------------------------------|---------------------------------|---------------|--------------------|
| Campbell County | | | |
| Black Hills Energy | Wyodak | 58 | 3,735,402 |
| Buckskin Mining Co. | Buckskin Mine | 247 | 18,223,969 |
| Eagle Specialty Minerals LLC | Belle Ayr | 255 | 14,257,882 |
| Eagle Specialty Minerals LLC | Eagle Butte | 262 | 15,062,345 |
| Navajo Transitional Energy Co. | Antelope Mine | 481 | 21,656,665 |
| Navajo Transitional Energy Co. | Cordero Rojo Mine | 305 | 12,463,913 |
| Peabody Caballo Coal LLC | Caballo Mine | 200 | 12,055,977 |
| Peabody Caballo Coal LLC | Rawhide Mine | 122 | 10,335,565 |
| Peabody Powder River Mining LLC | North Antelope/Rochelle Complex | 1,444 | 60,389,761 |
| Thunder Basin Coal Co. LLC | Black Thunder Mine | 1,032 | 62,181,557 |
| Thunder Basin Coal Co. LLC | Coal Creek Mine | 90 | 3,534,896 |
| Western Fuels of Wyoming, Inc. | Dry Fork Mine | 62 | 3,572,963 |
| Lincoln County | | | |
| Kemmerer Operations Inc. | Kemmerer Mine | 226 | 2,123,414 |
| Sweetwater County | | | |
| Black Butte Coal Co. | Black Butte and Lucite Hills | 173 | 2,035,630 |
| Pacific Minerals dba Bridger Coal Co. | Surface operations | 206 | 2,635,864 |
| Bridger Coal Co. | Underground operations | 4 | - |
| | | Totals | 5,167 |
| | | | 244,265,803 |

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