BUREAU OF BUSINESS & ECONOMIC RESEARCH

ECONOMIC IMPACT ANALYSIS OF FULLY STAFFING THE OIL CONSERVATION DIVISION'S REGULATORY AND ENVIRONMENTAL REMEDIATION FUNCTIONS - PRELIMINARY ANALYSIS

Prepared for the New Mexico Energy, Minerals, & Natural Resources Department

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Executive Summary

- The Oil & Gas industry is a critical contributor to the statewide economy as well as state and local government budgets;
- The New Mexico Oil & Gas sector accounts for 21% Gross State Product (GSP) – 2nd only to Oklahoma;
- Revenues generated from Oil & Gas exploration and production are responsible for contributing over 30% of the state's recurring tax revenues (FY21);
- Oil & Gas production in New Mexico has grown at a faster rate than surrounding states over the last five years;
- New Mexico produces more crude oil (onshore) than all other states except for Texas;
- Although New Mexico oil & gas production has doubled in the last few years, staffing at the Oil Conservation Division (OCD) has not kept pace with the expanding industry;
- Low funding and low staffing levels at OCD and the robust New Mexico Oil & Gas sector have combined to contribute to significant backlogs in the processing of permits and applications;
- As of December 31, 2021, there was a backlog of 6,267 Engineering applications and a backlog of 4,344 Environmental actions;
- The Environmental backlog in C-141's (the application needed to clean up spills) is estimated to be as high as 3,939;
- Additional staffing at OCD would help to facilitate the clearing of substantial backlogs and allow the OCD to manage the new permits and applications in a timely manner. The clearing of these backlogs would be expected to have measurable economic and fiscal impacts statewide;
- Preliminary estimates suggest that funding additional FTE's to assist with Remediation and Reclamation, C-141 applications, for example, could add $426 million in direct economic impacts and $30 million in Gross Receipts Taxes;
- Additional funding to staff the processing of Authorizations to Transport, C-104's, could move roughly $35 million in tax revenues into the current fiscal year by eliminating the current 36-day lag in processing times;
- This report serves as a preliminary analysis of the role of the EMNRD Oil Conservation Division and the direct and indirect economic and fiscal impacts the OCD has in New Mexico; the comprehensive report will be completed and available by the end of the fiscal year.

Introduction

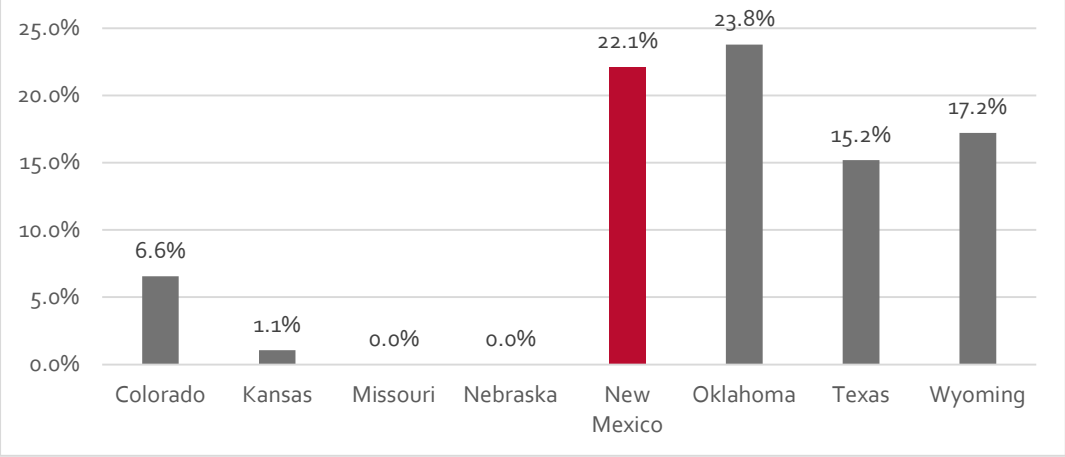
This report serves as a preliminary analysis of the role of the New Mexico Energy, Minerals, & Natural Resources Department (EMNRD) Oil Conservation Division (OCD) and the direct and indirect economic and fiscal impacts the OCD has in New Mexico. The first part of this preliminary report considers, at a high level, the oil & gas industry and the contributions it makes to New Mexico's economy and fiscal position. The second part of the study considers the permitting and regulatory activities of the OCD and its budget and performance trends. The final section of the report presents preliminary economic and fiscal impact estimates that OCD's activities could support with adequate staffing, particularly in the areas of Engineering and Environmental remediation and reclamation. Because the data used to estimate impacts is very high level, estimates are effectively degree of magnitude impacts. Throughout this write-up, in addition to discussing and reviewing the most relevant recent studies, we also highlight areas of additional consideration that merit deeper dives in the context of a more comprehensive study.

Oil & Gas Industry in New Mexico

Importance of O&G in Terms of Output, Employment and Tax Impacts

Largely because of the substantial volumes of oil & gas produced in New Mexico, the proportion of the value of state production (Gross State Product, GSP) attributable to the oil & gas extraction is high.[i] In 2020, approximately 22.1% of the value of all private sector economic output in New Mexico was from oil & gas extraction. This is a larger share than most surrounding states. The exception is Oklahoma (oil & gas is 23.8% of GSP).

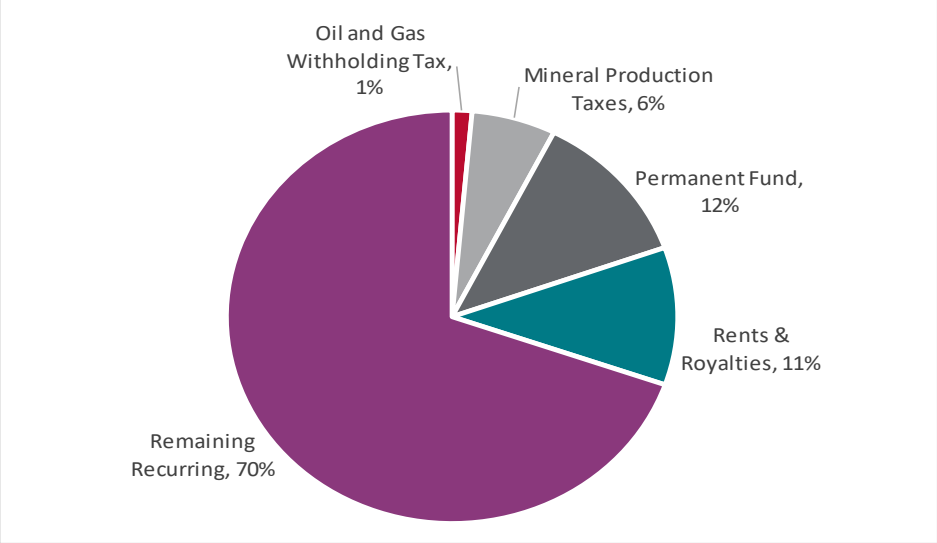
Figure 1. The Value of Oil and Gas Production as a Percent of the Value of Real Gross State Product in 2020 by State, Private Industries Only



Source: Bureau of Economic Analysis

Mineral extraction, which includes the oil & gas sector makes a significant contribution to the New Mexico state and local finances. Operations by the mining industry are critical to state revenues, and hence the state budget, either directly or indirectly. In FY21, former or ongoing extractive operations accounted for approximately 30% of the state's recurring revenues. This number is nearly $3 billion by some estimates, and as high as 35% of recurring revenues depending on the year and the methodology used, with over $1 billion going towards education spending. While this percentage vacillates depending on production volumes, commodity prices, leasing behaviors, and the like, revenues from mining and extraction industries constitute a key source of income for the state.

Figure 2. Proportion of Estimated Recurring Revenue by Category in FY21 through May 2021

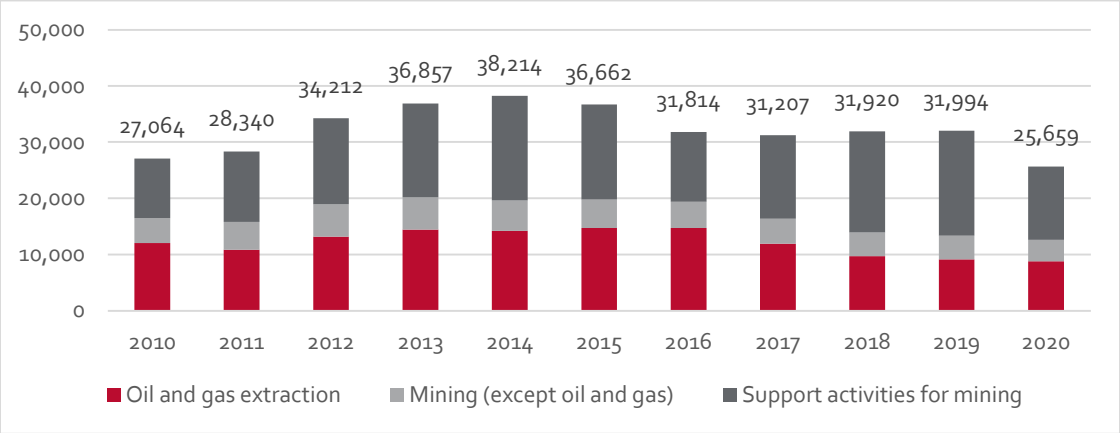


Source: NM Legislative Finance Committee

New Mexico Mineral and Oil & Gas Extraction (O&G) Employment & Compensation

Total mineral extraction employment varies based on market conditions, such as commodity prices or product demand, and technology, which may require more or fewer workers. Over the period from 2010 through 2020, total employment, which includes wage & salary workers as well as proprietors, averaged about 37,000 jobs from 2013-2015 before falling to below 32,000 jobs from 2016-2019. Due to the combined impact of low commodity prices, in particular low oil prices, and the Coronavirus Pandemic, jobs in the industry fell to below 26,000 in 2020.

Figure 3. New Mexico Mineral Extraction (O&G) Industry Total Employment by Type

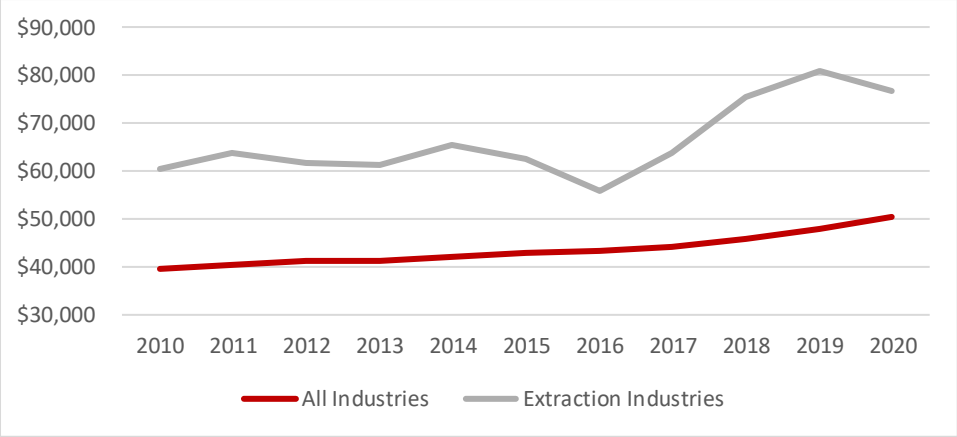


Source: Bureau of Economic Analysis

New Mexico mineral extraction employment is broadly comprised of three components: oil and gas extraction, non-oil & gas mining, and support activities for mining, which may cover both oil & gas or non-oil & gas activities. Over time, the share of total mining jobs in the extraction components (oil & gas and non-oil & gas) has fallen whereas jobs in support activities have risen. Currently, jobs are fairly evenly divided between extraction and support activities.

Over the period from 2010 to 2020, about 3.0% of all jobs in New Mexico were in the mineral extraction industries.[ii] However, on average, these industries provide higher salaries than other industries; in 2020, total compensation was some 52% higher than compensation in other industries. Despite the relatively small mineral extraction workforce relative to total state employment, because of the relatively high industry compensation, this industry accounts for roughly 4.5% of all worker compensation in the state.

Figure 4. Nominal annual compensation by industry in New Mexico



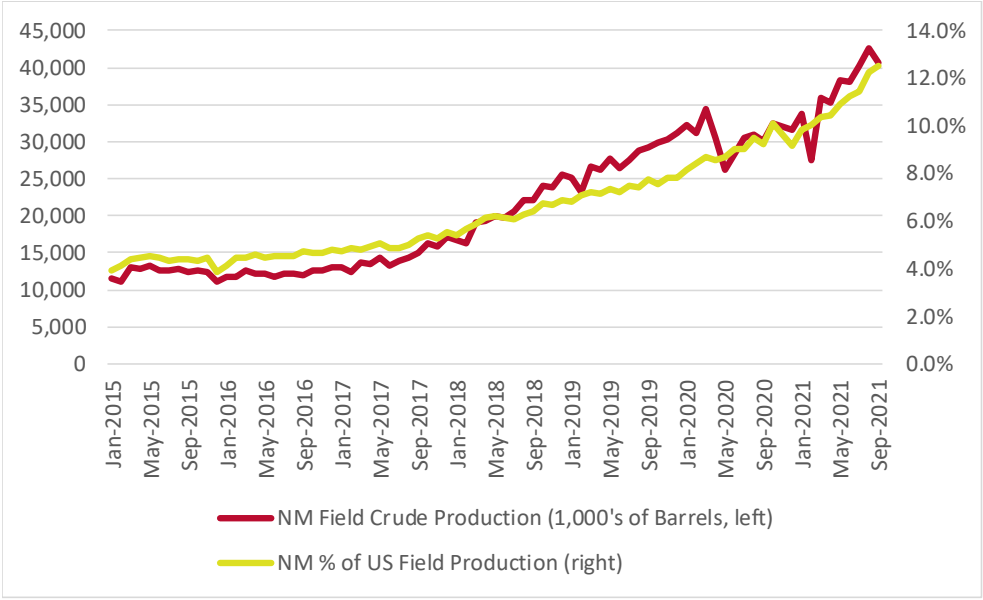
Source: Bureau of Economic Analysis

High salaries and compensation benefit local economies as workers spend their disposable incomes in the places where they live and work. In addition, revenues flow to the state via personal income taxes collected from workers, and revenues flow to state and local governments via gross receipts tax collections via purchases made by those workers. Property taxes are also collected from workers that own taxable property in tax collection areas.

Oil & Gas Market Trends

Oil production has increased substantially over the last several years in New Mexico. Whereas New Mexico only accounted for about 3.9% of all US field production in 2015, the state now accounts for roughly 12.5% of all US production.

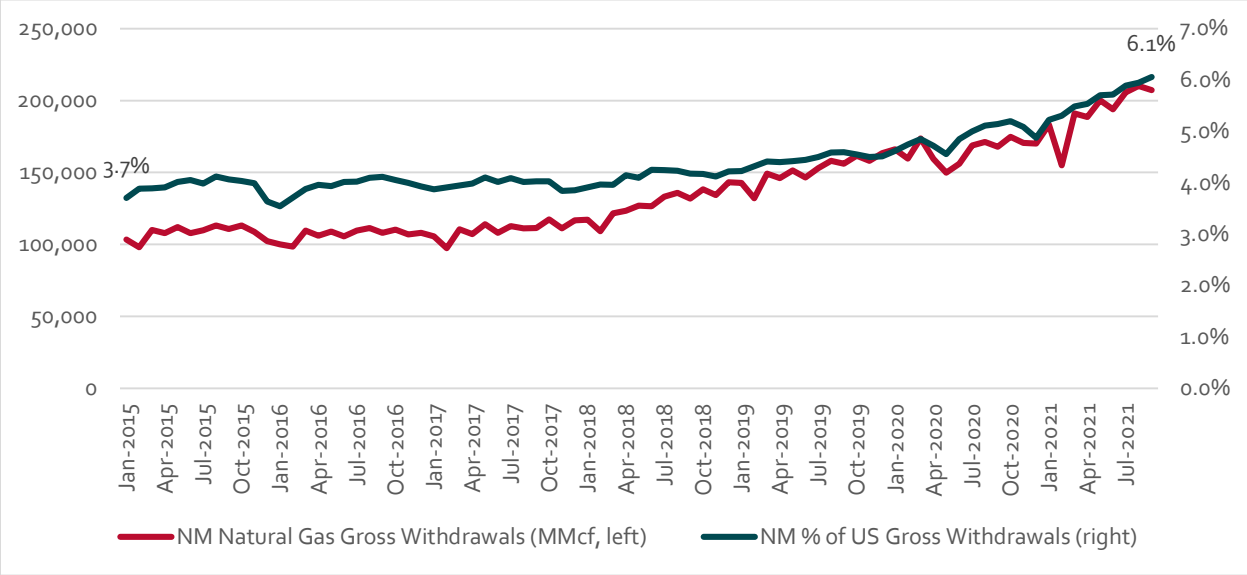
Figure 5. New Mexico Crude Oil Production



Source: Energy Information Administration (EIA)

Like oil production, gas production in New Mexico has increased, though not by as much. In early 2015, New Mexico accounted for about 3.7% of all natural gas withdrawals – by September 2021, that increased to about 6.1% of all US withdrawals.

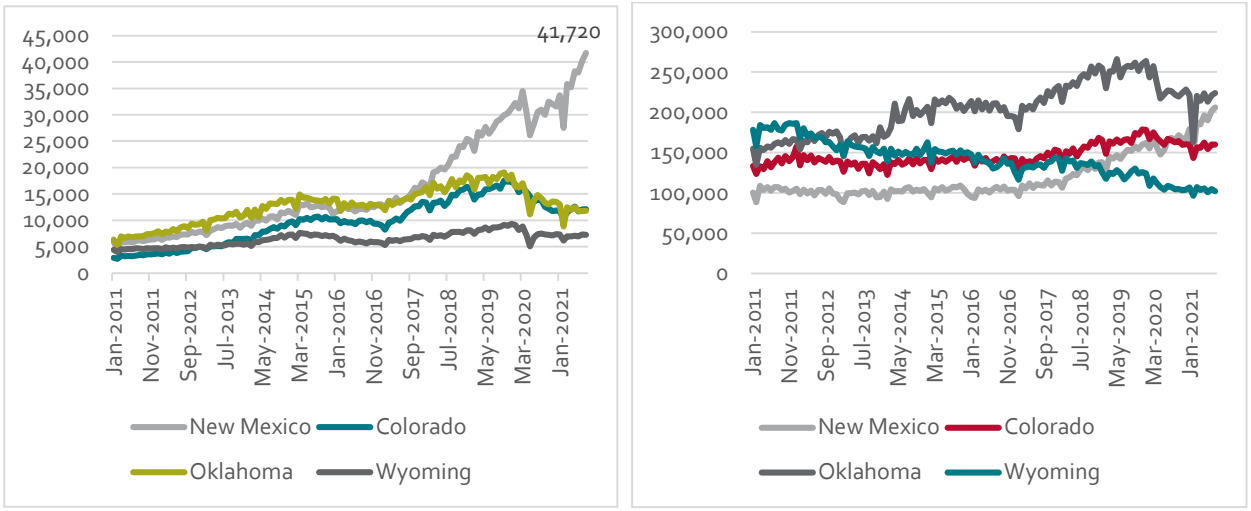
Figure 6. New Mexico Natural Gas Gross Withdrawals



Source: Energy Information Administration (EIA)

Putting the production data in slightly different terms, oil & gas production in New Mexico has tended to increase relative to surrounding states that had produced similar volumes to the state beginning in 2011. Oil production in New Mexico now dwarfs production in Oklahoma, Colorado, and Wyoming and while New Mexico previously produced the smallest volume of natural gas, only Oklahoma currently produces a greater volume.

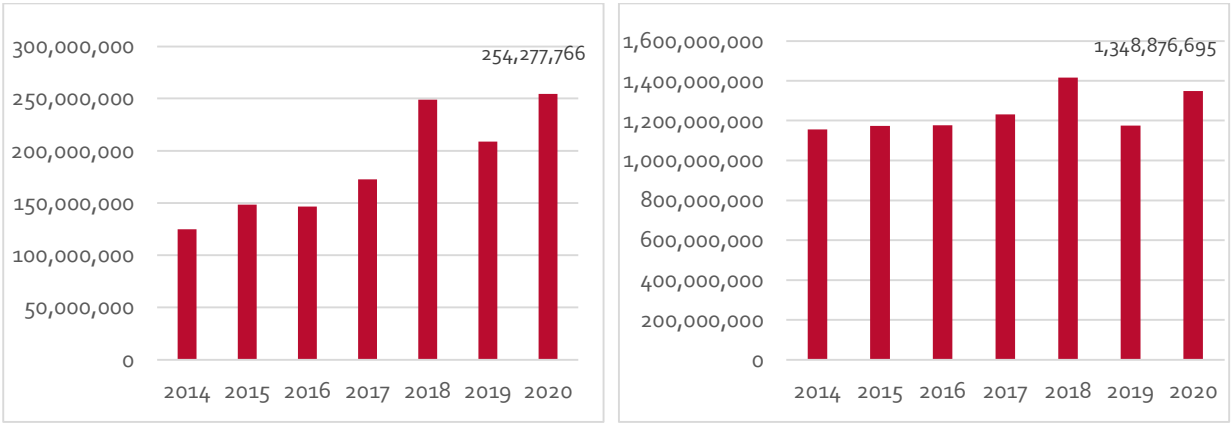
Figure 7. Comparison of Oil Production (1,000's of Barrels, left) and Natural Gas Production (MMcf, right)



Source: Energy Information Administration (EIA)

In 2020, New Mexico produced 254,277,766 barrels (bbls) and 1,348,876,696 thousand cubic feet (MCF). The Permian Basin, as a whole, accounts for one-third of total production in the United States. Strong production in Lea and Eddy Counties caused New Mexico to rank second among all other states in the country in production (EIA production data thru October 2021).[iii]

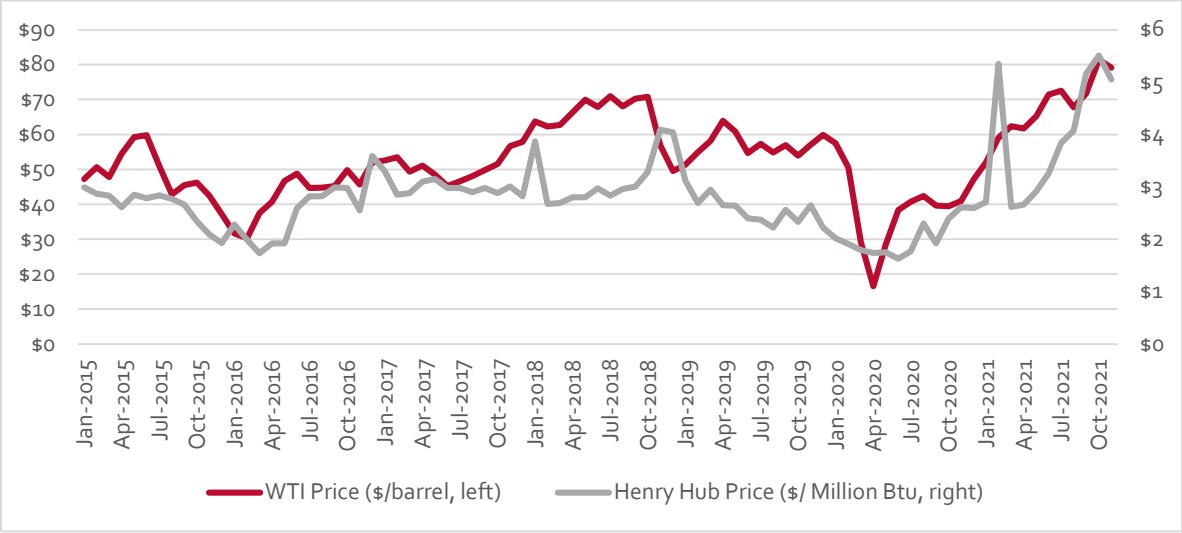
Figure 8. Oil (BBLs, left) and Natural Gas Production (MMcf, right)



Source: 2020 EMNRD Annual Report

Oil & gas prices, as reported by West Texas Intermediate and Henry Hub, are volatile and dependent on market conditions. However, after pandemic-related price declines in the first half of 2020, prices have firmed. Oil & gas production and price are critical to state budgets as they, along with royalty rates, are functionally related to royalty revenues.

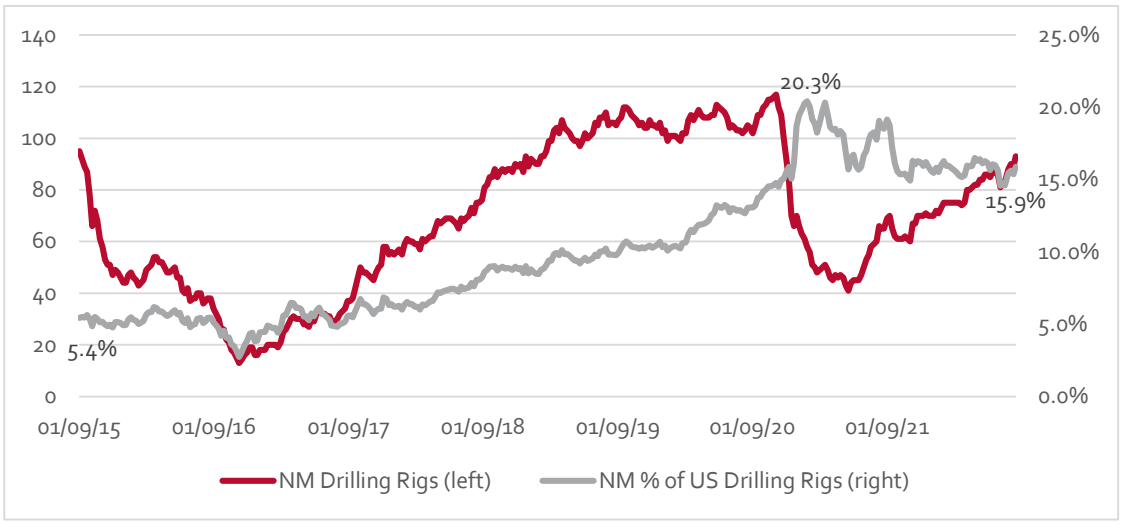
Figure 9. West Texas Intermediate (WTI) Crude & Henry Hub Price



Source: Energy Information Administration (EIA)

Drilling activity has accelerated in New Mexico in the last five years especially beginning in 2017. Prior to 2017, about 5.5% of all rigs operating in the US were in New Mexico. However, that percentage slowly increased to more than 15% by 2020 before peaking to over 20% by May 2020. Coinciding with low West Texas Intermediate price, and despite the fact that New Mexico accounted for roughly one-fifth of all US rigs, rig counts fell from about 115 in March 2020 to a recent low of 41 in September 2020. Rig counts have recovered and by the end of 2021 totaled about 93. Currently, about 16% of all rigs operating in the US are operating in New Mexico.

Figure 10. New Mexico Drilling Rigs



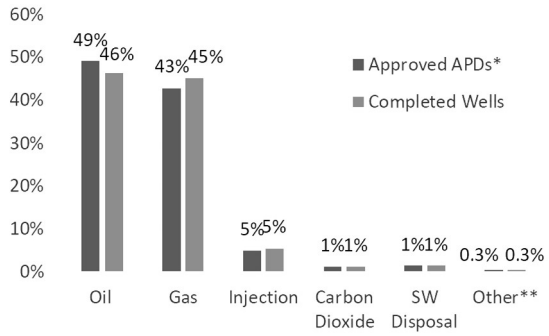
Source: Baker Hughes

Overview and Background of OCD Permitting and Regulatory Activities

As the primary regulator of all oil and gas activity in New Mexico, the OCD permits new oil, gas and injection wells, and enforces the State's oil and gas statutes and rules to prevent waste, protect correlative rights, and protect human health and the environment. The OCD is directly and indirectly responsible for exploration, production, and servicing activities in the state as well as all reclamation and remediation activities. The OCD manages the lifecycle of a well from drilling and completion to ensuring wells are plugged and that land is restored once production activities are done. Increased oil and gas development, including new wells permitted by the OCD have resulted in marked increase in oil & gas production since 2015.

One of the Agency's primary functions is to review and approve all permitting for new drilling and new oil and gas wells. The OCD tracks Application for Permit to Drill (APD's) and wells drilled and completed by the type of well. There are roughly 60,000 Completed Wells and 67,000 wells that have received APD's; four out of five completed wells are specifically Oil or Gas producing wells (54,862) with the remainder classified as saltwater disposal, CO_2 wells, etc.

Figure 11. Approved APDs and Completed Wells in New Mexico, 2020



Well Type	Approved APDs*	Completed Wells
Carbon Dioxide	752	733
Gas	28,763	27,081
Injection	3,320	3,288
Misc	130	114
Oil	32,962	27,781
Salt Water Disposal	982	851
Water	45	44
Total	66,954	59,892

**Not Cancelled, Not Plugged. **SW Disposal = Salt Water Disposal*

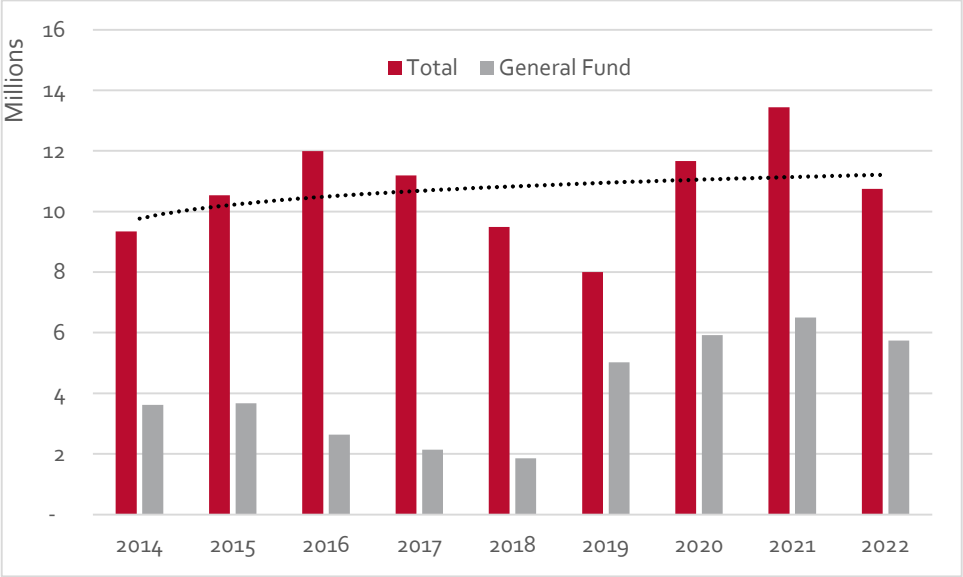
Source: 2020 EMNRD Annual Report

Statistics tracked by the Division demonstrate high levels of efficiency in APD's where 94.63% of applications are approved within 10 days of receipt. This exceeds the Division's performance target of 85%. As part of the OCD's regulatory function, the agency completed 36,779 inspections and/or integrity testing reviews of oil and gas wells and facilities and associated documentation in FY2020.[iv]

Permitting and regulatory activities of the OCD, directly and indirectly, contribute to the collection of nearly $3 billion in tax revenues, by some estimates. However, while the OCD has multiple funding sources, it depends almost solely on General Fund revenues for its operating budget. The reclamation and IT fees fund, which make up a substantial part of the OCD's budget, however, cannot be used to support staffing or operations except for $153,000 annually out of the reclamation fund. Nearly half of the OCD's $10.7 million budget (FY22) is

restricted for the use of reclamation clean-up activities, leaving approximately $6 million available for the operating budget, which includes staff salaries. Although crude oil production has more than doubled from 125 million bbls (barrels) in 2014 to 254 million bbls in 2020, growth in the OCD budget has been muted, expanding at an annual rate of 4% per year in the same period.

Figure 12. OCD Fiscal Year Budget, 2014-2022



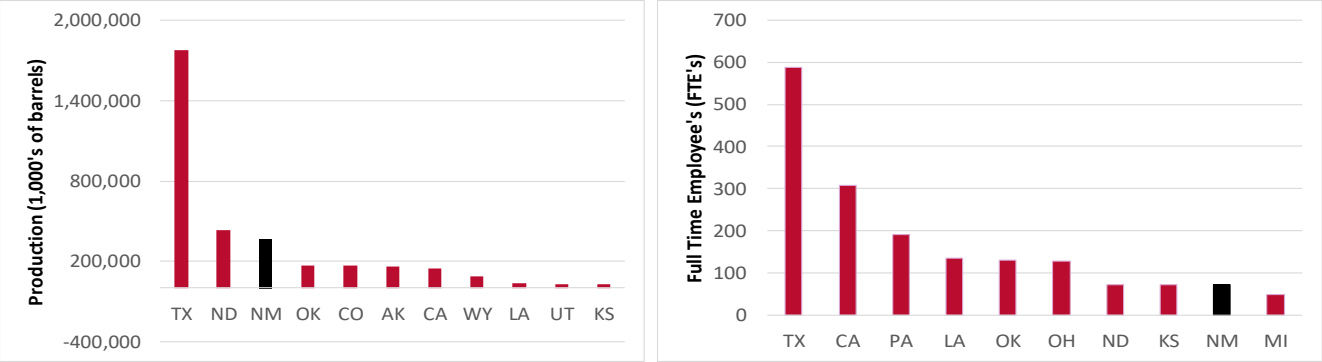
Source: OCD Administrative Data

OCD is also responsible for regulations related to environmental clean-up (remediation & reclamation). Although the OCD exceeds their 85% performance goal of approving all new drilling applications within 10 days, insufficient staffing has resulted in bottlenecks in the Remediation & Reclamation activities where the backlog for current environment-related applications and actions totaled 4,344; however, in a regular 52-week calendar period, the backlog will increase by approximately 1,300 applications under current staffing levels. EMNRD estimates that the time needed to eliminate the Environmental backlog would require approximately 41,000 hours to complete, or 9 additional FTE's. The Engineering backlog totaled 6,267 (by calendar year end 2021); however, in a regular 52-week calendar period, the backlog will increase by approximately 8,684 applications under current staffing levels. The Engineering backlog is estimated to take 3,391 hours to eliminate, which would require more than 6 additional FTEs, including a supervisor.

The OCD has 73 FTE's for the current fiscal year. Of these, 10 are in the engineering bureau administrative permitting group and of those 6 are dedicated to the processing of Engineering permits and applications; there are 16 FTE's responsible for the Environmental permitting, remediation and reclamation applications (these numbers include supervisory positions). Between the Engineering and Environmental groups, there are 8 vacancies for a vacancy rate of 31%. The following figure compares data from Interstate Oil & Gas Compact Commission's *Budget, Staffing, and Funding of State and Provincial Oil and Gas Regulatory* report that shows that although New Mexico ranked 3rd in crude oil production, the state ranks 9th in terms of staffing (all numbers reported using 2020 values). Greater volumes of production are driven by more drilling activity and more active

wells, and also more extensive environmental activities in the form of reclamation and remediation. The full study, to be completed by June 2022, will delve into the relationships between regulatory activities, permitting staffing, oil & gas production, and related activities.

Figure 13. State Gov. Oil & Gas Permitting & Regulation Staffing (right) and Production (left) Levels (Top 10 Rankings), 2020



Source: Interstate Oil & Gas Compact Commission. U.S. Energy Information Agency; Energy Information Administration.

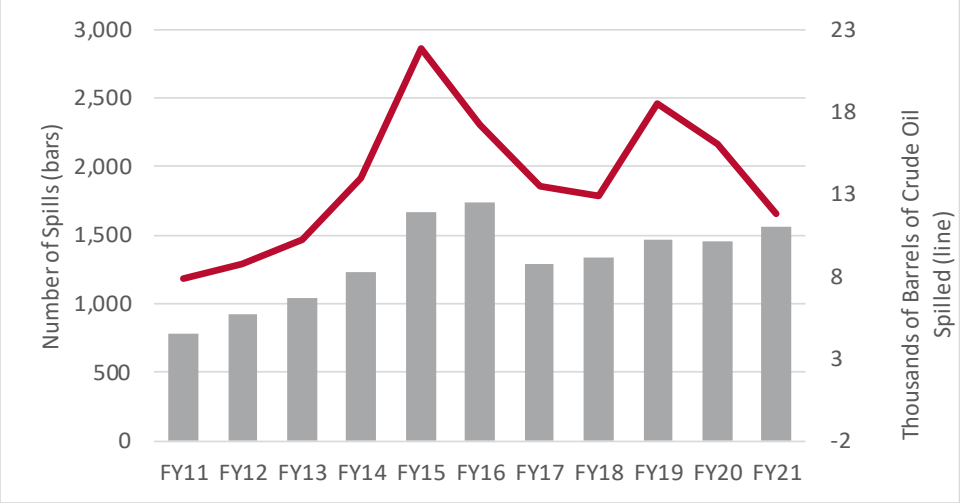
Preliminary Economic and Fiscal Impacts of Increased Application Processing

Reclamation and Remediation Applications

Because of the substantial backlog on EMNRD's environmental remediation side, there are likely economic and fiscal impacts associated with permitting and applications not being completed in a timely manner. This analysis seeks to quantify some of these impacts using OCD data and existing current research. According to a 2021 Vertex study commissioned by the New Mexico State Land Office, there were 123,223 well sites located across the state. Of these well sites, 57,095 were plugged and released, or sites that were permitted but never drilled, thus do not require plugging and abandonment activities. The remaining 66,128 well sites require plugging, abandonment, and reclamation; most of these are still considered Active. The Vertex study estimates the costs associated with specific environmental clean-up activities. These activity types are: Downhole Abandonment, Wellpad Surface Facility Decommissioning, Pipeline Decommissioning, Commercial Lease Surface Facility Decommissioning, Surface Reclamation.[v]

Because the clean-up processes require various applications and permit types, low budget and staffing at the OCD has prevented timely clean-up. According to OCD data there were 13,715 releases over the last decade where nearly 140,000 barrels of crude oil were spilled and required clean-up. The number of spills has averaged nearly 1,400 per year.

Figure 14. Accidental Releases by Number and Thousands of Barrels (BBLs), 2011 - 2021



Sources: OCD Administrative Data.

The C-141 "Release Corrective Action" is the application primarily associated with spill clean-ups. The OCD estimates the backlog for these to be 3,939. The average processing time for the C-141's is 22.7 days. Because the OCD plays a critical role in the permitting, review, and approval of environmental clean-up in the state, these environmental remediation and reclamation activities represent potential economic activity in the form of employment, personal income, and tax revenues. For the purpose of quantifying the pent up and deferred economic and fiscal impacts caused by backlogs and bottlenecks attributable to the budget and staffing shortfalls at the OCD, this analysis considers the Surface Reclamation cost estimates developed in the Vertex report. Using these cost data, BBER estimates that the average cost per site clean-up is $108,314. This is a weighted average and only considers wells drilled prior to 2012, as failing older equipment is often cited as the cause of accidental releases.

Figure 15. Surface Reclamation Cost Estimates by Basin and Type[vi]

Basin	Well Type	Avg. Per Well Cost	Well Count	Per Well Wtd. Cost	Pct.%
Permian	Oil	99,705	17,658	37,993	38%
Permian	Gas	78,545	5,252	8,902	11%
Permian	SWD	80,199	857	3,336	2%
San Juan	Oil	53,894	1,664	4,352	4%
San Juan	Gas	53,866	19,595	51,226	42%
San Juan	SWD	136,568	104	689	0%
Other	Oil	28,676	299	416	1%
Other	Gas	29,733	888	1,281	2%
Other	SWD	105,994	23	118	0%
		TOTAL	**46,340**	**108,314**	

Source: Vertex

Applying the backlog of 3,939 spills that still need to be cleaned up, an average cost of $108,314 to clean up these sites, and assuming additional staffing at the OCD was funded to clear the backlog, this could result in

direct expenditures of $426.6 million. As the following table shows, annual expenditures of $426 million will result in a direct (annual) Employment impact of 1,800 jobs and a total effect of 3,694. The Labor Income impact would generate an increase of $227 million. Total Output would generate $697 million. The multipliers for Employment, Labor Income, and Output are 2.1, 1.6, and 1.6, respectively. In the full report of this study, we will seek to complete a more nuanced review of the economic impacts of both environmental reclamation and remediation activities as well as, where possible, exploration & production activities.[vii],[viii]

*Figure 16. Total Economic Impacts from Potential Environmental Remediation & Reclamation**

Impact Type	Employment	Labor Income	Output
Direct Effect	1,800	144,867,047	426,648,830
Indirect Effect	864	43,240,084	134,836,365
Induced Effect	1,030	39,452,672	136,101,979
Total Effect	3,694	227,559,802	697,587,174
Multiplier	2.1	1.6	1.6

*Labor Income and Output in $millions.
Sources: IMPLAN 3.0; estimates developed by UNM BBER.

Given that most of this activity will be subject to Gross Receipts Taxes, we estimated the economic impacts associated with the clean-up. Because nearly all of these wells are located in Lea, Eddy, and San Juan Counties, we used a weighted tax rate of 7.12%. Applying this rate on $426 million in direct economic activity, the potential GRT revenues is $30 million. The full report will seek to consider other tax types such as taxes on Corporate and Personal Incomes. For example, the average compensation per worker in the Oil & Gas industry is markedly higher than state averages. Higher wages for these workers will contribute to Personal Income tax revenues and larger disposable incomes will contribute to higher spending, impacting local economies as well as the state budget. The final report will also seek to more thoroughly evaluate linkages between full (recommended) staffing at the OCD and economic and fiscal impacts.

Authorized Production applications

We also made a preliminary attempt to quantify the possible impacts of staff shortages and the resulting backlog of C-104 applications, which allows companies to begin new oil & gas production. Using a 7-month sample from June to December 2021, the estimated backlog for C-104's was 529 applications. Using OCD's daily per well peak production of 1,500 bbls, and applying it to the 529 potential wells, they estimate that 30 days of production is equivalent to 23.8 million barrels. Applying the $71.71 WTI crude oil spot price for December 2021 the market value for one month of foregone production is estimated to be in the neighborhood of $1.7 billion. Increased staffing at OCD could help to move forward production by 30 days if they were to meet their targeted processing time of 6-7 days for the C-104's, which should serve to increase economic activity and tax collections. For example, the monthly average of Severance and Emergency Tax revenues in fiscal year 2021 was equivalent to $35 million. In the full study we will seek to develop detailed estimates for potential economic and fiscal impacts of deferred production.

[i] GSP is a measurement of the value of a state's output. It is the sum of the value added from all industries in a state.

[ii] Because of data constraints mining is broadly defined to include oil & gas extraction, non-oil & gas extraction, and support activities for mining.

[iii] https://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbl_m.htm.

[iv] Inspections consist of site inspections of oil and gas wells, associated facilities, releases, and general site conditions. (2020 EMNRD Annual Report).

[v] Under NMAC 19.15.25 ("Plugging and Abandonment of Wells"), **Downhole Well Abandonment** (2.0), requires operators to plug wells in a manner that permanently confines all oil, gas and water in the separate strata in which they are originally found using mud-laden fluid, cement and plugs. **Wellpad Surface Facility Decommissioning** (3.0) involves the removal of all surface facilities including pumps and pump jacks, storage tanks and containment, removal of wellheads, cutting and capping of well, removal of foundations. **Pipeline Abandonment** (4.0) involves the disposal of fluids, cutting and capping end of flowlines, and the removal of surface piping and risers. **Commercial Lease Site Decommissioning** (5.0) involves the removal of all surface facilities including: buildings and storage structures, water, electrical, transfer stations, frac ponds, compressor sites, storage site and storage tanks, processing and dehydration facilities; additionally the removal of foundations, concrete pads, parking areas and runways, and driven screw piles. **Surface Reclamation** (6.0) involves the reclamation of all land to pre-oil and gas use to their original condition, the removal of wellsite or facility fencing, removal of roads and pads, excavation and removal of contaminated soils, ripping and turning of all compacted soils, emplacement of backfill material, contouring the site to achieve erosion control, long-term stability and preservation of surface water flow, re-establishing vegetation, environmental testing and assessment. (Source: TITLE 19, Chapter 15, Part 25 NMAC, <https://nmonesource.com/nmos/nmac/en/item/18057/index.do#!b/t19c15p25>, retrieved on 12/30/2021.)

[vi] The per well weighted average cost was used. As a result, the Permian Oil and the San Juan Gas wells will receive a larger weight in calculating the average per well cost (e.g. 99,705 * (17,658/46,340) = 37,993).

[vii] The input-output multipliers were computed using IMPLAN 3.1, which is an industry standard software program used to conduct economic impact analysis. These multipliers are then used to estimate the impacts on the New Mexico economy. IMPLAN estimates the total economic impacts, where the total economic impact is comprised of the sum of direct, indirect, and induced impacts. IMPLAN uses a variety of data sources to estimate these impacts, including Bureau of Labor Statistics (BLS) Covered Employment and Wages; Census Bureau County Business Patterns (CBP); and Bureau of Economic Analysis Regional Economic Accounts (REA). Direct impacts refer to immediate economic impacts generated by initial expenditures on remediation and reclamation activities, such as spending on employee compensation, goods and services, and capital projects. Indirect impacts result from secondary spending by New Mexico companies that provide goods and services to

supported businesses. Induced impacts stem from spending by employees on goods and services for personal consumption for items such as for housing, food, clothing or childcare. Full definitions for common terms used in this report, such as direct, indirect, and induced impacts, employment, compensation, multipliers, and output follow. **Employee Compensation**: The sum of wage and salary income, benefits, and other non-cash compensation. **Employment**: The estimated number of full-and-part-time jobs directly and indirectly supported by SBIC supported businesses. **Direct Impacts**: The initial, immediate economic impacts generated by direct expenditures. **Indirect Impacts**: The economic impact resulting from spending by New Mexico companies (contractors) from which supported businesses buy goods and services. This spending creates a demand for the goods and services of local companies, which must then subsequently purchase their own goods and services to produce their product. The sum total of these iterative purchases is termed indirect impacts. **Induced Impacts**: The economic impact resulting from supported businesses' employees spending a portion of their salary on goods and services for personal consumption, e.g. housing, food, clothing, or childcare. This spending induces additional employment in many sectors of the economy, such as jobs at the local grocery store**. Impact Analysis**: A net change in a region's existing economy that can be attributed to a given industry, event, or policy, which brings new revenues into the region that would otherwise not occur in the region; or which keeps revenues in the region that would otherwise be lost to the region. **Labor Income**: The employee compensation (wage and salary income including benefits) plus proprietors' income (self-employed income). **Multipliers**: An economic multiplier measures the total change in the number of jobs/income/output resulting from an initial change in job/income/output of an industry/company being studied. **Output**: The total market value of goods and services that go to final and intermediate consumption. In this case, it is the total economic activity resulting from remediation and reclamation activities. It is also a measure of the state's state product created as a result of reclamation and remediation activities.

[viii] BBER bridged IMPLAN sector codes with the 2017 NAICS classifications for this analysis. (https://www.census.gov/naics/?input=environmental+remediation+services&year=2017&details=562910)